भाकृ अनुप
ICAR

2023
ANNUAL REPORT
वार्षिक प्रतिवेदन

भा.कृ.अनु.प.–कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान, क्षेत्र–IV

ICAR- Agricultural Technology Application Research institute, Zone-IV

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PREFACE

Krishi Vigyan Kendras (KVKs) were established as pioneering institutions aimed at extending agricultural knowledge and technologies to farmers across the nation. Spearheaded by the ICAR-Agricultural Technology Application Research Institute, Zone IV, Patna, in collaboration with 68 KVKs in Bihar and Jharkhand, these centers employ a bottom-up approach. Their primary objective is to bridge the gap between research and farming communities through participatory technology assessment ensuring active farmer involvement in planning, execution and evaluation of agricultural programs.

With the evolving agricultural landscape and emerging challenges, KVKs have expanded their role beyond mandated activities. To effectively broaden their services, the institute has implemented various flagship programs of national priority. These programs, highlighted in the annual report, encompass initiatives like crop diversification through Cluster Front Line Demonstration (CFLD) focusing on Pulses and Oilseeds, the National Innovations in Climate Resilient Agriculture (NICRA) addressing the climate change on agricultural system, Seed Hub for Pulses, Promotion of Natural Farming through KVKs, Farmer FIRST Programme (FFP) for enhanced farmers-scientist interactions, Attracting and Retaining Youth in Agriculture (ARYA) to provide employment opportunities in agricultural sector, Farmer's Producer Organizations, Gramin Krishi Mausam Sewa (GKMS), Cereal Systems Initiative in South Asia (CSISA) etc.

Recognizing the challenges ahead, such as doubling farmers' income and enhancing agricultural productivity, the institute emphasizes the validation of improved agricultural technologies in farmers' fields. The major activities, including On-Farm Trials (OFT), Front Line Demonstrations (FLD), training programs, extension activities and mobile advisory services are also meticulously documented to showcase successful implementations and positive outcomes at grass root level.

Moreover, the document underscores the effective engagement with diverse stakeholders and evaluates the performance of Extension Education Directorates of Central and State Agricultural Universities and KVKs within the zone's jurisdiction. It aims to provide a clear vision for organized and progressive agriculture in the region.

Heartfelt gratitude is extended to Dr. U.S. Gautam, Deputy Director General (Agricultural Extension), and Assistant Director Generals (Agricultural Extension) for their constant guidance for implementation of these activities and programs in this Zone. In this endeavor, our heartfelt thanks to the Vice-Chancellors, Directors of Extension Education, Programme Coordinators of KVKs, ATIC managers, and all KVK staff for their timely contributions. Special acknowledgment is given to scientific staff, research fellows, young professionals, and data entry operators for their tireless efforts in compiling and editing the annual report, with the hope that it will benefit various stakeholders, including policymakers, researchers, developmental functionaries, and farmers.

July 15, 2024
Patna

(Anjani Kumar)
Director, ICAR-ATARI

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आईसीएआर–अटारी ने ऑन–फार्म परीक्षणों और फ्रंटलाइन प्रदर्शनों में सभी पूर्व निर्धारित लक्ष्यों को सफलतापूर्वक पूरा किया है। हमारे कृषि विज्ञान केंद्र (केवीके) ने फसल क्षेत्र, पशुधन क्षेत्र और संबद्ध क्षेत्रों से संबंधित विविध प्रौद्योगिकियों का आकलन करने पर ध्यान केंद्रित करते हुए 3001 स्थानों पर 666 ऑन–फार्म परीक्षण किए हैं। इन परीक्षणों से प्राप्त समाधानों को प्रौद्योगिकी कैप्सूल के रूप में मुख्यधारा की राज्य विस्तार प्रणाली में एकीकृत करने से पहले उनकी प्रभावकारिता सुनिश्चित करने के लिए छोटे पैमाने पर प्रदर्शनों के माध्यम से मूल्यांकन किया गया था। इसके अतिरिक्त, अनुसंधान प्रणाली को बहुमूल्य फीडबैक प्रदान किया गया है, जिससे विकसित प्रौद्योगिकियों को क्षेत्र की व्यापक कृषि–पारिस्थितिकी स्थितियों के साथ संरेखित करने के लिए आवश्यक सुधार या संशोधन संभव हो सके।

अग्रिम पंक्ति प्रदर्शन

केवीके ने अनाज, दालें, तिलहन, सब्जियां, फल और अन्य सहित विभिन्न फसलों की उत्पादकता बढ़ाने के लिए नई जारी किस्मों की उत्पादन क्षमता और अनुशंसित प्रथाओं को प्रदर्शित करने के लिए फ्रंटलाइन प्रदर्शन आयोजित किए हैं। इस कार्यक्रम के तहत, खरीफ, रबी और गर्मी के मौसम के दौरान दलहन, तिलहन, अनाज, बागवानी और अन्य फसलों के अग्रिम प्रदर्शनों के लिए कुल 3743.74 हेक्टेयर भूमि को कवर किया गया है। इन प्रदर्शनों से पूरे क्षेत्र में 14771 किसानों को सीधे लाभ हुआ है। विशेष रूप से, प्रदर्शनों में अनाज (1798.42 हेक्टेयर), दालें (510.95 हेक्टेयर), तिलहन (521.60 हेक्टेयर), सब्जियां (437.21 हेक्टेयर), फलों की फसलें (52.00 हेक्टेयर), और अन्य फसलें (423.56 हेक्टेयर) शामिल थीं, जिसमें 5303, 2039, 1423 शामिल थे।, क्रमशः 4375, 460 और 1170 किसान। पशुधन क्षेत्र में, विभिन्न प्रदर्शन कार्यक्रम आयोजित किए गए, जिसमें 2848 किसान और 11834 पशुधन शामिल थे। इसके अलावा, 112 किसानों द्वारा 102.50 हेक्टेयर जल क्षेत्र को कवर करते हुए मत्स्य पालन में प्रदर्शन किया गया।

समूह अग्रिम पंक्ति प्रदर्शन

सीएफएलडी दलहन और तिलहन कार्यक्रम ने कई मौसमों (खरीफ, रबी और जायद) में सफल कार्यान्वयन हासिल किया। विविध कृषि को बढ़ावा देने के लिए, परती चावल के उपयोग और फसल सघनता बढ़ाने पर विशेष जोर दिया जाएगा। 6100 प्रदर्शनों को कवर करते हुए कुल 2440 हेक्टेयर भूमि आवंटित की गई, और 6661 प्रदर्शनों के माध्यम से लक्ष्य उपलब्धि 2349 हेक्टेयर तक पहुंच गई। सीएफएलडी तिलहन के तहत 11290 प्रदर्शनों के माध्यम से 4020 हेक्टेयर क्षेत्र को कवर किया गया।

क्षमता विकास

आवश्यक ज्ञान और कौशल के साथ किसानों, कृषक महिलाओं, ग्रामीण युवाओं और विस्तार कार्यकर्ताओं की क्षमता विकास की आवश्यकता को संबोधित करना। कुल 220 प्रशिक्षण कार्यक्रम आयोजित किए गए हैं, जिससे पुरुषों और महिलाओं दोनों सहित 6181 व्यक्तियों को लाभ हुआ है। ग्रामीण युवाओं के प्रशिक्षण के तहत, केवीके ने कुल 1228 प्रशिक्षण कार्यक्रम आयोजित किए, जिससे 34243 ग्रामीण युवाओं और लड़कियों को लाभ हुआ। विस्तार कार्यकर्ताओं के प्रशिक्षण के तहत, केवीके ने कुल 557 पाठ्यक्रम आयोजित किए, जिससे 20319 विस्तार व्यक्तियों को लाभ हुआ। प्रतिभागियों की आवश्यकताओं को पूरा करते हुए 1464 प्रायोजित प्रशिक्षण कार्यक्रम भी आयोजित किए गए। इसके अतिरिक्त, केवीके ने 11568 प्रतिभागियों के लिए कृषि और संबद्ध क्षेत्रों में 407 पाठ्यक्रमों को कवर करते हुए व्यावसायिक प्रशिक्षण कार्यक्रम आयोजित किए।

ग्राम बीज उत्पादन कार्यक्रम

ग्राम बीज उत्पादन कार्यक्रम ने विभिन्न प्रमुख फसलों के लिए कुल 25211.95 क्विंटल बीज का सफलतापूर्वक उत्पादन किया है। बीज उत्पादन आवश्यक फसलों जैसे धान (7778.43 क्विं), गेहूं (2873.55 क्विं), सब्जियां (11232. 99 क्विं.), सरसों (272 क्विं.), अरहर (214.94 क्विं.) चना (87.91 क्विं.), मसूर (95.73 क्विं.) पर केंद्रित है।मक्का (35. 16 क्विं.), हल्दी (22.10 क्विं.) और अलसी (4.17 क्विं.)।

मिट्टी और पानी के नमूने का विश्लेषण

मिट्टी और पानी के नमूने के तहत केवीके ने पूरे क्षेत्र के 1558 गांवों से कुल 33709 नमूनों का विश्लेषण किया है, जिससे 32459 किसान लाभान्वित हुए हैं। बिहार में 993 गांवों में 17917 नमूनों का विश्लेषण किया गया, जिसमें 18405 किसान लाभान्वित हुए और झारखंड में 565 गांवों में 15792 नमूनों का विश्लेषण किया गया, जिसमें 14054 किसान लाभान्वित हुए।

किसान मोबाइल सलाहकार

किसान मोबाइल एडवाइजरी किसानों को सही समय पर अपेक्षित और आवश्यकता आधारित कृषि जानकारी प्रसारित करने के लिए सूचना और संचार प्रौद्योगिकी (आईसीटी) उपकरणों में से एक है। रिपोर्टिंग वर्ष के दौरान, उज्ञपेंदपोर्टल के माध्यम से 34 ज्ञटज्ञ द्वारा दी गई 9244 सलाह से कुल 2410647 किसान लाभान्वित हुए।

वैज्ञानिक सलाहकार समिति की बैठक

प्रगतिशील किसानों, गैर सरकारी संगठनों और अन्य से इनपुट के साथ अगले वर्ष के लिए कार्य योजना तैयार करने के लिए केवीके दिन–प्रतिदिन के कार्यों की गहराई से समीक्षा करने और स्थानीय मुद्दों पर बात करने के लिए वार्षिक वैज्ञानिक सलाहकार समिति (एसएसी) की बैठक बुलाते हैं। बिहार राज्य में 36 केवीके और झारखंड राज्य में 19 केवीके ने कुल 55 SAC बैठकें आयोजित की ।

जलवायु अनुकूल कृषि में राष्ट्रीय नवाचार

वर्ष के दौरान, बिहार और झारखंड के 32 गांवों में 14 केवीके ने एनआईसीआरए परियोजना के प्रौद्योगिकी प्रदर्शन घटक (टीडीसी) को लागू किया। विस्तार गतिविधियों के हिस्से के रूप में कुल 427 कार्यक्रम आयोजित किए गए, जिसमें 4680 किसानों को प्रशिक्षण प्रदान किया गया।

आर्या परियोजना

केवीके के समर्पित प्रयासों के माध्यम से और आईसीएआर–अटारी, पटना की देखरेख में, 471 उद्यमशीलता इकाइयां स्थापित की गईं (बिहार में 314 और झारखंड में 157) जिसमें बिहार में पोल्ट्री फार्मिंग से अधिकतम उद्यमशीलता इकाइयां और बकरी पालन से अधिकतम उद्यमशीलता इकाइयां शामिल हैं। झारखंड की स्थापना हुई. 58 प्रशिक्षण कार्यक्रम आयोजित किए गए (बिहार में 34 और झारखंड में 24) जिसमें 1760 ग्रामीण युवाओं को प्रशिक्षित किया गया (1030 पुरुष और 730 महिलाएं) और वर्तमान में 680 उद्यमशीलता इकाइयाँ क्रियाशील पाई गईं।

फार्मर फर्स्ट कार्यक्रम

परियोजना में 72 विस्तार गतिविधियों के साथ–साथ प्राकृतिक संसाधन प्रबंधन (115), कृषि संबंधी फसलें (875), बागवानी फसलें (1258), एकीकृत कृषि प्रणाली (93), पशुधन और मत्स्य पालन (218) से संबंधित हस्तक्षेपध्प्रदर्शनों की एक विस्तृत श्रृंखला शामिल है। . कार्यान्वयन संस्थानों और राज्य कृषि विश्वविद्यालयों ने इस परियोजना के माध्यम से चयनित किसानों और उनके परिवारों की समग्र आजीविका को बढ़ाने के लिए मिलकर काम किया है। अकेले वर्ष 2023 में, इस पहल से कुल 5808 कृषक परिवार लाभान्वित हुए।

बीज हब कार्यक्रम

नई दलहन किस्मों के लिए सर्वोत्तम बीजों के उत्पादन को सक्रिय रूप से बढ़ावा देने के लिए केवीके द्वारा वर्ष के दौरान 6483.95 क्विंटल दलहन बीज का उत्पादन करके एक सराहनीय पहल की गई।

जिला कृषि–मेट्रोलॉजिकल इकाई परियोजना

2023 में, बिहार में 12 और झारखंड में 05 केंद्रों सहित कुल 17 केंद्रों ने अपने–अपने जिलों में किसानों के साथ ब्लॉक–स्तरीय कृषि मौसम सलाहकार सेवाओं को सफलतापूर्वक विकसित और साझा किया। पूरे वर्ष में, बिहार और झारखंड के 463 ब्लॉकों को कवर करते हुए कुल 1609 कृषि–सलाहकार बुलेटिन जारी किए गए, जिससे कुल 523959 किसान लाभान्वित हुए। इसके अतिरिक्त, किसानों को ग्रामीण कृषि मौसम सेवा के मूल्यवान लाभों के बारे में शिक्षित करने के लिए 1186 किसान जागरूकता कार्यक्रमों की एक श्रृंखला आयोजित की गई।

प्राकृतिक खेती परियोजना

इस परियोजना के तहत आईसीएआर–अटारी जोन–प्ट में कुल 39 केवीके (बिहार में 28 और झारखंड में 11) को इस उद्देश्य के लिए चुना गया था। रिपोर्टिंग वर्ष के दौरान, केवीके द्वारा किसानों के खेत और केवीके फार्म में 121070 प्रतिभागियों के साथ 676 जागरूकता कार्यक्रम, 8173 प्रतिभागियों के साथ 212 प्रशिक्षण कार्यक्रम और 468 प्रदर्शन (01 एकड़ प्रत्येक) आयोजित किए गए।

कृषि–ड्रोन परियोजना

अटारी पटना की एक नई पहल के रूप में 08 किसान ड्रोन खरीदे गए और प्रदर्शन के तहत 1244.41 हेक्टेयर क्षेत्र को कवर किया गया और 09 प्रशिक्षण कार्यक्रम आयोजित किए गए।

जनजातीय उपयोजना

जनजातीय क्षेत्रों में अल्प विकास की चुनौतियों से निपटने और जनजातीय आबादी की जरूरतों को पूरा करने के लिए, इस क्षेत्र के 24 जिलों में टीएसपी नामक एक समर्पित कार्यक्रम लागू किया गया है। टीएसपी परियोजना के तहत केवीके ने कुल 1189.41 क्विंटल विभिन्न बीज और रोपण सामग्री का उत्पादन किया, जिसे आदिवासी क्षेत्रों में वितरित किया गया। इसके अतिरिक्त, लगभग 4638 किसानों की मिट्टी, पानी, पौधे और खाद के नमूनों का उनके संबंधित जिले केवीके में परीक्षण किया गया। इसके अलावा, 630683 से अधिक किसानों को कृषि संबंधी एसएमएस संदेश और सलाह प्राप्त करने से लाभ हुआ, जिससे उन्हें अपनी कृषि पद्धतियों को बढ़ाने के लिए बहुमूल्य जानकारी मिली।

अनुसूचित–जाति उपयोजना

यह कार्यक्रम अटारी–जोन–4 के 52 केवीके के अंतर्गत संचालित है। इनके अंतर्गत 9683 प्रतिभागियों के साथ किसानों के लिए 320 प्रशिक्षणध्प्रदर्शन कार्यक्रम आयोजित किए गए। कुल कार्यक्रम में 3943 प्रतिभागियों के साथ महिला किसानों के लिए 128, 2223 प्रतिभागियों के साथ ग्रामीण युवाओं के लिए 72 और 167 विस्तार व्यक्तियों के साथ विस्तार कर्मियों के लिए 03 कार्यक्रम केवीके द्वारा आयोजित किए गए थे।

पोषक तत्व–संवेदनशील कृषि संसाधन और नवाचार

इस परियोजना के तहत, 39 केवीके ने महिलाओं और युवा लड़कियों के बीच पोषण साक्षरता और पोषण सुरक्षा में सुधार के लिए 165 पोषक–स्मार्ट गांवों में विभिन्न गतिविधियां आयोजित कीं। वर्ष के दौरान केवीके ने पोषण–आधारित हस्तक्षेपों पर विभिन्न प्रौद्योगिकियों पर 09 ओएफटी और 679 एफएलडी आयोजित किए। इसके साथ ही 6819 कृषक महिलाओं को लाभान्वित करने वाले 220–प्रशिक्षण कार्यक्रम और 6064 लाभार्थियों के लिए 174 विस्तार कार्यक्रम भी आयोजित किए गए।

स्वच्छता कार्य योजना

इस परियोजना में किसानों की प्रथाओं पर इस तकनीक की स्थिरता का अध्ययन करने के लिए वर्मीकम्पोस्टिंग इकाइयों की स्थापना के लिए कुल 06 केवीके (बिहार में 03 केवीके अर्थात् बेगुसराय, नवादा, जहानाबाद और झारखंड में 03 केवीके अर्थात् रांची, गोड्डा और देवघर) का चयन किया गया था। इसके साथ ही डेयरी फार्म अपशिष्ट प्रबंधन के प्रति पशुपालकों द्वारा अपनाए गए ज्ञान, दृष्टिकोण और प्रथाओं का आकलन करने के लिए प्रत्येक जिले से 20 किसानों का चयन किया गया था।

नई विस्तार पद्धति और दृष्टिकोण परियोजना

नई विस्तार पद्धतियां और दृष्टिकोण (NEMA) आईसीएआर की एक नेटवर्क परियोजना है, जिसमें कृषि विस्तार विभाग की आरएसी (अनुसंधान सलाहकार समिति) के मार्गदर्शन में एटीआरआई शामिल है, संपूर्ण केवीके नेटवर्क अनुसंधान विभिन्न गतिविधियों को कवर करने वाली एटीआरआई की एक नेटवर्क परियोजना द्वारा नियोजित अनुसंधान गतिविधियों में शामिल है। उनके संबंधित क्षेत्रों की समस्याधविषयगत क्षेत्र।

किसान सारथी

किसान सारथी राष्ट्रीय परिप्रेक्ष्य के साथ स्थानीय स्तर पर कृषि का समर्थन करने के लिए एक बुद्धिमान ऑनलाइन डिजिटल मंच है। वर्ष 2023 के दौरान बिहार के 43 केवीके (425216) और झारखंड के 23 केवीके (77457) द्वारा कुल 502673 किसानों का पोर्टल पर पंजीकरण किया गया है।

एकीकृत कृषि प्रणाली

आय के स्रोतों में विविधता के लिए एकीकृत कृषि प्रणाली फसल पूरे वर्ष स्थिर नकदी प्रवाह प्रदान कर सकती है,। कृषि विज्ञानं केन्द्रो के द्वारा झारखंड में 25 और बिहार में 146 IFS मॉडल्स को स्थापित किया गया। इस दौरान ै के तहत विभिन्न गतिविधियां आयोजित की गईं, जिनमें बिहार में 6115 किसानों के लिए 1324 प्रदर्शन और 1342 किसानों के लिए 76 प्रशिक्षण कार्यक्रम शामिल हैं । झारखंड में इस अवधि के दौरान 985 किसानों के लिए 511 प्रदर्शन और 5321 किसानों के लिए 184 प्रशिक्षण कार्यक्रम आयोजित किए गए ।

कृषि प्रौद्योगिकी सूचना केंद्र (ATIC)

वर्ष 2023 के दौरान, 3967 किसानों ने ।ज्ब् से संपर्क कियाध्दौरा किया। ATIC ने किसानों की 11025 मिट्टी और पानी के नमूनों का भी परीक्षण किया, किसानों को 3435 कृषि–सलाहियाँ प्रदान कीं।

विस्तार शिक्षा निदेशालय द्वारा तकनीकी बैकस्टॉपिंग

विस्तार शिक्षा निदेशालयों द्वारा तकनीकी बैकस्टॉपिंग में गतिविधियों की एक विस्तृत श्रृंखला शामिल है, जैसे 49 एसएसी बैठकें, 19 कार्यशालाध्सेमिनार, 10 प्रौद्योगिकी सप्ताह, 115 प्रशिक्षण कार्यक्रम, 14 किसान मेला, 62 महत्वपूर्ण बैठक समारोह। विस्तार शिक्षा निदेशालय ने उन्नत बीज (640 क्यू), रोपण सामग्री (7986), मशरूम स्पॉन (42 क्यू), पशुधन (210), मछली स्पॉन (400000), कुक्कुट नस्ल (26000), खनिज मिश्रण (2900 q), जैसे तकनीकी उत्पाद भी प्रदान किए। जैव उर्वरक (4600), पशु चारा (480 क्यू), वर्मीकम्पोस्ट (600 क्यू), एचआरडी प्रशिक्षण (12), विभिन्न केवीके को उनके हितधारक किसानों की आवश्यकताओं के अनुसार 18 प्रकाशन।

विशेष कार्यक्रम

वर्ष के दौरान अटारी पटना के तत्वावधान में केवीके ने राष्ट्रीय महत्व के विभिन्न विशेष कार्यक्रमों का आयोजन किया जैसे विकसित भारत संकल्प यात्रा, अंतर्राष्ट्रीय बाजरा वर्ष के तहत बाजरा को बढ़ावा देना, बाजरा रेसिपी प्रतियोगिता, प्रौद्योगिकी सप्ताह समारोह, स्वच्छ भारत अभियान, राष्ट्रीय महिला किसान दिवस, अंतर्राष्ट्रीय योग दिवस, अंतर्राष्ट्रीय खाद्य दिवस, विश्व मृदा दिवस समारोह, सतर्कता जागरूकता सप्ताह, हिंदी पखवाड़ा, विश्व बौद्धिक संपदा दिवस, वार्षिक क्षेत्रीय कार्यशाला, आईसीएआर–अटारी का स्थापना दिवस, प्राकृतिक खेती पर राज्य स्तरीय कार्यशाला, अभिविन्यास कार्यक्रम, डीडीजी के साथ इंटरैक्टिव बैठक, मंत्रियों का दौरा, डीजी आईसीएआर का दौरा, माननीय प्रधान मंत्री/कृषि मंत्रीध्सरकार के कार्यक्रम का सीधा प्रसारणकिया गया।

मानव संसाधन विकास और प्रकाशन

अटारी जोन–प्ट ने मानव संसाधन विकास और कौशल वृद्धि गतिविधियों को सुविधाजनक बनाने के लिए मानव संसाधन विकास के तहत10 प्रमुख बैठकें, कार्यशालाएंध्प्रशिक्षण कार्यक्रम आयोजित किए। इसके साथ ही रिपोर्टिंग वर्ष 2023 के दौरान ATARI द्वारा 09 शोध पत्र और 07 लोकप्रिय लेख प्रकाशित किए गए और ज्ञटज्ञ द्वारा 126 शोध पत्र और 277 लोकप्रिय लेख प्रकाशित किए गए।

प्रबंधन सूचना प्रणाली का कार्यान्वयन

वर्ष के दौरान अटारी ने किसान सारथी, कृषि विज्ञान केंद्र (केवीके) नॉलेज नेटवर्क, कृषि पोर्टल, एमआईएस–एफएमएस, सार्वजनिक वित्त प्रबंधन प्रणाली, केवीके द्वारा ऑन–लाइन रिपोर्टिंग, राष्ट्रीय किसान पोर्टल, ई–ऑफिस, राष्ट्रीय किसान पोर्टलवगैरह को सफलतापूर्वक लागू किया।

EXECUTIVE SUMMARY

On-Farm Trials

ICAR-ATARI has successfully accomplished all the predetermined targets in on-farm trials and frontline demonstrations. Our Krishi Vigyan Kendra (KVK) has conducted a remarkable number of 666 on-farm trials across 3001 locations, focusing on assessing diverse technologies related to crop sector, livestock sector, and allied sectors. The solutions derived from these trials were further evaluated through small-scale demonstrations to ensure their efficacy before integrating them into the mainstream state extension system in the form of technology capsules. Additionally, valuable feedback has been provided to the research system, enabling necessary improvements or modifications to the developed technologies to align them with the wider agro-ecological conditions of the zone.

Frontline Demonstrations

The KVKs have conducted frontline demonstrations to showcase the production potential of newly released varieties and recommended practices for enhancing the productivity of various crops, including cereals, pulses, oilseeds, vegetables, fruits, and others. A total of 3743.74 hectares of land has been covered under frontline demonstrations on pulses, oilseeds, cereals, horticulture, and other crops during the kharif, rabi, and summer seasons. These demonstrations have directly benefitted 14771 farmers across the zone. Specifically, the demonstrations covered cereals (1798.42 ha), pulses (510.95 ha), oilseeds (521.60 ha), vegetables (437.21 ha), fruit crops (52.00 ha), and other crops (423.56 ha), engaging 5303, 2039, 1423, 4375, 460 and 1170 farmers, respectively. In the livestock sector, various demonstration programs were organized, involving 2848 farmers and having11834demonstrations on livestock including poultry. Furthermore, demonstrations in fisheries were carried out by 112 farmers, covering a water area of102.50hectares.

Cluster Frontline Demonstration

The CFLD pulses and oilseed program achieved successful implementation across multiple seasons, (Kharif, Rabi, and Zaid). For promotion of diversified agriculture, with a specific emphasis on utilizing rice fallow and increasing cropping intensity through CFLD on Pulses. A total of 2440 ha of land was allocatedcovering 6100 demonstrations, and the target achievement reached 2349 ha through 6661 demonstrations on pulse crop. Under CFLD oilseed an area of 4020 ha through 11290 demonstrations covered.

Capacity Development

To address the need of capacity development of farmers, farm women, rural youth, and extension functionaries with the necessary knowledge and skills. A total of 220 training programs have been conducted, benefitting 6181 individuals, including both men and women. Under training of rural youth, the KVKs conducted a total of 1228 training programs, benefitting 34243 rural youths and girls. Under training for Extension Functionaries, KVK conducted a total of 557 courses, benefitting 20319 extension persons. A together 1464 sponsored training programs, catering to the needs of participants were also organized. Additionally, the KVKs organized vocational training programs covering 407 courses in the areas of agriculture and allied sectors for 11568 number of participants.

Village Seed Production Programme

Village seed production programme has successfully produced a total of 25211.95 q of seeds for various major crops. The seed production focused on essential crops such as paddy (7778.43 q), wheat (2873.55 q), vegetables (11232.99 q), mustard (272 q), pigeon pea (214.94 q) chickpea (87.91 q), lentil (95.73 q), maize (35.16 q), turmeric (22.10 q) and linseed (4.17q).

Analysis of Soil and Water Sample

Under Soil and Water Sample KVKs have analyzed a total of 33709 samples from 1558 villages across the zone, benefitting 32459 farmers. In Bihar 17917 samples analyzed in 993 village in which 18405 farmers are benefitted and in Jharkhand 15792 samples analyzed in 565 village in which 14054 farmers are benefitted.

Kisan Mobile Advisories

Kisan Mobile Advisory is one of the Information and Communication Technology (ICT) tools for dissemination of requisite and need based agricultural information to the farmers at the right time. During the reporting year, a total of 2410647 farmers were benefited from 9244 advisories delivered by 34 KVKs through m-Kisan portal.

Scientific Advisory Committee Meeting of KVKs

The KVKs convene the Annual Scientific Advisory Committee (SAC) meeting to go over the day-to-day work in depth and talk about local issues in order to prepare the Action Plan for the following year with input from progressive farmers, NGOs, and other agencies as well as all the line department members. A 36 SAC meeting were organized by KVKs of Bihar and 19 meetings by KVKs of Jharkhand were organized with a cumulative number of 55 SAC meeting in 2023.

National Innovations in Climate Resilient Agriculture

During the year, 14 KVKs across 32 villages in Bihar and Jharkhand implemented the Technology Demonstration Component (TDC) of NICRA project. A total of 427 programs were organized as part of extension activities, providing training to 4680 farmers.

Attracting and Retaining Youth in Agriculture Program

Through the dedicated efforts of the KVKs and under the supervision of ICAR-ATARI, Patna, 471 entrepreneurial units were established (314 in Bihar and 157 in Jharkhand), out of which maximum entrepreneurial units from poultry farming in Bihar and goat farming in Jharkhand were established. 58 training programs were organized (34 in Bihar and 24 in Jharkhand) in which 1760 rural youth were trained (1030 male and 730 female) and at present 680 entrepreneurial units were found functional.

Farmer FIRST Program

The project encompasses a wide range of intervention/demonstrations related to natural resource management (115), agronomical crops (875), horticultural crops (1258), integrated farming systems (93), livestock, and fisheries (218) along with 72 extension activities. The implementing institutes and State Agricultural Universities have worked together to enhance the overall livelihood of selected farmers and their families through this project. In the year 2023 alone, a total of 5808 farm families benefitted from this initiative.

Seed Hub Program

To actively promote the production of top-notch seeds for new pulse varieties a commendable initiative was undertaken by the KVKs through production of 6483.95 quintal pulse seed during the year.

District Agri-Metrological Unit

In 2023, a combined total of 17 centers, including 12 centers in Bihar and 05 in Jharkhand, successfully developed and shared block-level Agromet Advisory Services with farmers in their respective districts. Throughout the year, a total of 1609agro-advisory bulletins were issued, covering 463 blocks in Bihar and Jharkhand, benefiting a total of 523959 farmers. Additionally, a series of 1186 Farmers Awareness Programs (FAPs) were conducted to educate farmers about the valuable benefits of the Gramin Krishi Mausam Sewa.

Cereal System Initiative in South Asia

project

ICAR collaboration with CSISA of CIMMYT has implemented this project to increase the staple crops yields and incomes of millions of farms families through wide spread adoption of efficient and productive agronomic practices. This includes cultivation of high yielding and stress tolerant cereal cultivar across ecologies. Under Zone IV, 10 in Bihar and 04 in Jharkhand conducted demonstrated technologies related to DSR, zero tillage, puddled transplanted rice, transplantation and line sowing during the year.

Out-scaling of natural farming through KVKs

In ICAR-ATARI Zone- IV under this project a total 39 KVKs (28 in Bihar and 11 in Jharkhand) were selected for this purpose. During the reporting year, 676 awareness programs with 121070 participants, 212 training programs with 8173 participants and 468 demonstrations (01 acre each) were conducted by KVK in farmer's field and KVK farm.

Agri- Drone Project

As a new initiative of ATARI Patna 08 Nos. of Kisan Drones were purchased and an area covered of 1244.41 ha under demonstration 09 numbers of training programs organized.

Tribal Sub Plan

To tackle the challenges of under development in tribal regions and cater to the needs of the tribal population, a dedicated program called the TSP has been implemented across 24 districts within this area. KVKs under the TSP project produced a total of 1189.41q of various seeds and planting materials, which were distributed in tribal areas. Additionally, approximately 4638 farmers had their soil, water, plant, and manure samples tested at their respective district KVKs. Furthermore, over 630683 farmers benefited from receiving farm-related SMS messages and advisories, providing them with valuable information to enhance their agricultural practices.

Scheduled Caste Sub Plan

This programme is operational under 52 KVKs of ATARI-Zone-IV. Under these 320 training/demonstration programs for farmers were organized with 9683 participants. Among the total programme 128 for women farmers with 3943 participants, 72 for rural youth with 2223 participants and 03 for extensional personnels with 167 extension persons were organized by KVKs.

Nutri-Sensitive Agricultural Resources and Innovations

Under this project, 39 KVKs conducted various activities in 165 Nutri-smart villages for improving the nutrition literacy and nutritional security among the women and young girls. During the year KVKs conducted 09 OFTs and 679 FLD on various technologies on nutrition-based interventions. Along with this 220-training program benefitting 6819 farmwomen and 174 extension programs for 6064 beneficiaries were also organized.

Swachata Action Plan

In this project total 06 KVKs (03 KVKs in Bihar namely Begusarai, Nawada, Jehanabad and 03 KVKs in Jharkhand namely Ranchi, Godda and Deoghar) were selected for establishment of vermicomposting units in order to study the sustainability of this technology over the farmer's practices. Along with this the selection of 20 farmers from each district was done to assess the Knowledge, Attitude and Practices followed by the livestock farmers towards dairy farm waste management.

New Extension Methodology and Approaches

New Extension Methodologies and Approaches (NEMA) is a network project of the ICAR involving ATARI under guidance of RAC (Research advisory committee) of division of agriculture extension, the entire KVKs network research involve in research

activities planned by a network project of ATARI covering various problem/thematic area of their respective zones.

Kisan Sarathi

Kisan Sarathi is an intelligent online digital platform for supporting agriculture at local niche with national perspective. During the year 2023, a total 502673 farmers have been registered on the portal by the 43 KVKs of Bihar (425216) and 23 KVKs of Jharkhand (77457).

Integrated Farming System

Under promotion of Integrated Farming System by diversifying its sources of income KVKs of Jharkhand (25) and Bihar (146) have established various component wise IFS models. Various activities were also organized under IFS which includes 324 demonstrations for 6115 farmers and 76 training programs for 1342 number of farmers in Bihar. In Jharkhand 511 demonstration for 985 farmers and 184 training programs for 5321 farmers during the reporting period.

Agriculture Technology Information Centre (ATIC)

During the year 2023, 3967 number of farmers contacted/ visited ATIC. ATICs also tested 11025 soil and water samples of farmers, provided 3435 number of agro-advisories to the farmers.

Technological Backstopping by Directorates of Extension Education (DEE)

Technological Backstopping by Directorates of Extension Education encompasses a wide range of activities, such as 49 SAC meetings, 19 workshop/seminars, 10 technology weeks, 115 training programs, 14 Kisan mela, 62 important meeting celebrations. Directorates of Extension Education also provided technological products like improved seeds (640q), planting materials (7986), mushroom spawn (42q), livestock (210), fish spawn (400000), poultry breeds (26000), mineral mixture (2900q), biofertilizers (4600), animal feed (480q), vermicompost (600q), HRD trainings (12), 18 publications to various KVKs as per the requirements their stakeholder farmers.

Special Programme

During the year KVKs under the aegis of ATARI Patna organized various special programs of national importance like Viksit Bharat Sankalp Yatra, Promotion of Millets under International Year of Millets, Millet Recipe Contest, Technology Week Celebration, Swachh Bharat Abhiyan, Rastriya Mahila Kisan Diwas, International Yoga Day, International Food Day, World Soil Day celebration, Vigilance Awareness Week, Hindi Pakhwada, World Intellectual Property Day, Annual Zonal Workshop, Foundation Day of ICAR-ATARI , State Level Workshop on Natural farming, Orientation Program, Interactive Meeting with ICAR Officials, Interaction/Live Telecasted Program of Hon'ble Prime Minister/Agriculture Minister/Govt. of Indiawere organized by ATRAI and KVKs.

Human Resource Development and Publications

ATARI Zone-IV conducted 10 major meetings, workshops/training programmes under HRD to facilitate human resource development and skill enhancement activities. Along with this 09-research papers and 07 popular articles were published by ATARI and 126 research paper and 277 popular articles were published by the KVKs during the reporting year 2023.

Implementation of Management Information System

During the year ATARI successfully implemented Kisan Sarathi, Krishi Vigyan Kendra (KVK) Knowledge Network, KRISHI Portal, ARMS, Public Finance Management System, On-line reporting by KVKs, National Farmers' Portal, E-office, National Farmers' Portal etc.

INTRODUCTION

The ICAR-Agricultural Technology Application Research Institute (ATARI) was established on August 19, 2015, with its office located at Garbhukchak, Jagdeo Path, Patna-800014. ATARI's primary mandate is to strategize, oversee, and assess the programs undertaken by Krishi Vigyan Kendras (KVKs) in Bihar and Jharkhand. Additionally, ATARI is tasked with providing guidance to the KVKs, which are pivotal district-level agricultural institutions in the region.

Over the years, ATARI has significantly broadened its scope of services and has achieved notable success in the implementation of various programs. These initiatives encompass ARYA, Farmer's FIRST Program, Cluster Front Line Demonstrations focusing on Pulses and Oilseeds under the NFSM, Seed Hub on Pulses, New Extension Methodology and Approaches, Cereal Systems Initiative for South Asia, National Innovations in Climate Resilient Agriculture, Swachh Bharat Abhiyan, Tribal Sub Plan, District Agro Meteorological Unit, Jal Shakti Abhiyan, and outscaling Natural Farming. Each of these programs has been executed with commendable efficacy, contributing to the agricultural development of the region.

Mandate

- Monitoring and Coordinating various Research and technology programmes.
- Working as an integrated system with the KVKs for proper for agricultural extention programmes.

Salient Achievements

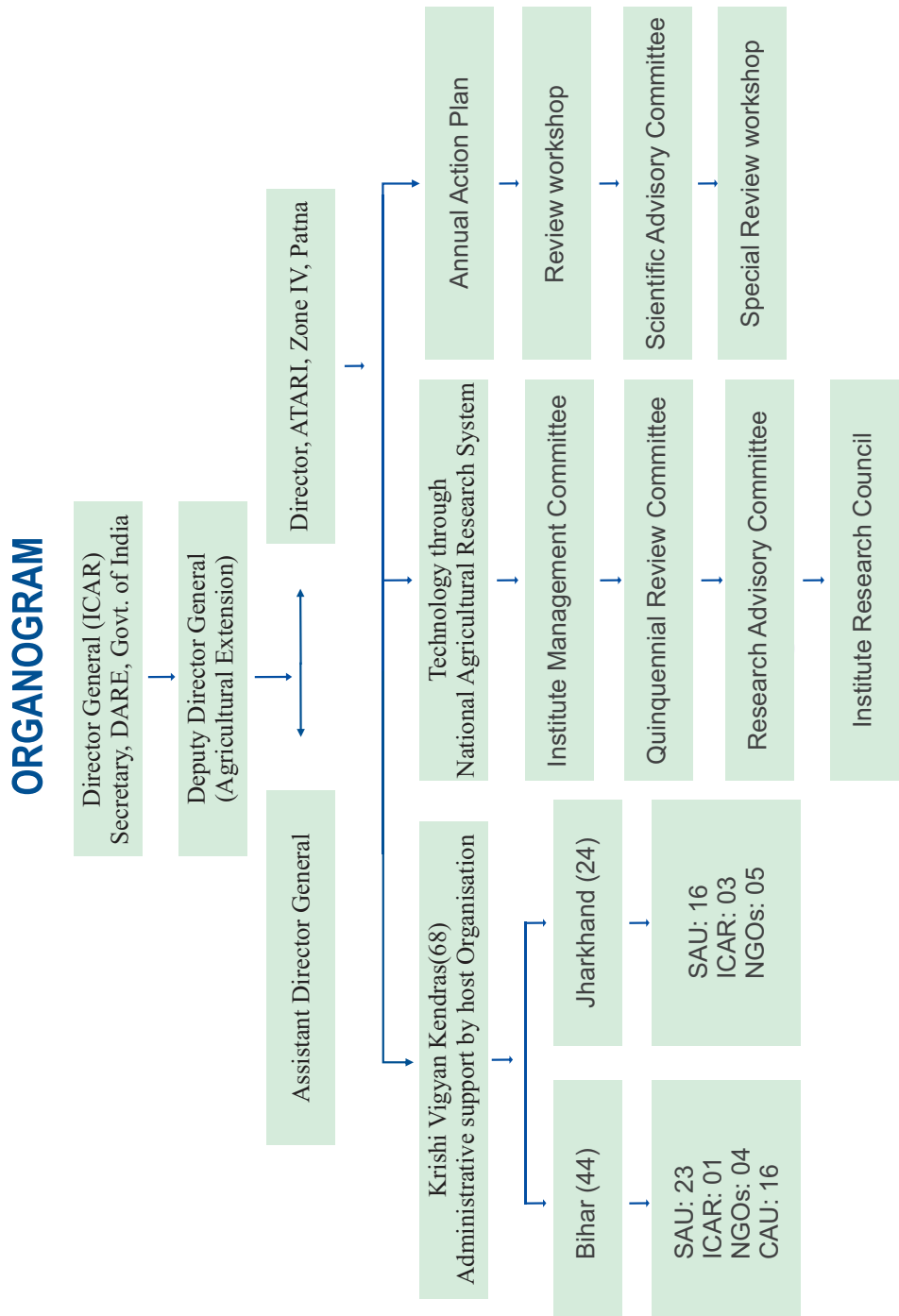
The Institute diligently monitored the activities of KVKs across Bihar and Jharkhand and successfully achieved all the predetermine targets in areas such as training, demonstration, and capacity building. A total of 666 on-farm trials were conducted, along with cluster front line demonstrations covering 2125 ha for pulses crops and 2553.80 ha for oilseed crops. Additionally,3743 front line demonstrations were conducted for field crops (covering 3743.74 hectares) and horticultural crops (covering 2562.70 hectares).

In terms of training, the Institute organized 6443 courses and training programs, benefitting around farmers. Moreover, it produced 10774.97 quintals of high-quality seeds for major field and horticultural crops, 3.12 million planting materials. Under Soil, Water and Plant analysis KVK of the zone IV tested 30369 soil sample tested benefitting 28600 no of farmers and total 1358 village cover. To review ongoing work and finalize action plans for the following year, 59 Scientific Advisory Committee meetings were successfully organized.

Furthermore, the Institute contributed to technology transfer through the other extension activities of 20448 publications. The ATARI team accomplished numerous meetings, workshops, conferences and training programs, both online and offline, aimed at human resource development and skill enhancement activities.

Infrastructure and the Organization

The Agricultural Extension Division Indian Council of Agricultural Research (ICAR) is responsible for overseeing the operations of 731 KVKs located throughout the country. The Deputy Director General (Agricultural Extension) is responsible for managing the administrative, financial, and overall functioning of this division.



At the state and district level, the ATARIs monitor the activities of KVKs within their respective zones. In Zone IV, which encompasses Bihar and Jharkhand states, ICAR-ATARI Patna is responsible for monitoring the operations of 68 KVKs.

Scientific Staff at ATARI, Patna

ICAR-ATARI HQ in Patna is having sanctioned scientific staff of 04, out of which only three are filled by December 2023.

Table 1: Staff strength of Agricultural Technology Application Research Institute, Patna

Category	Sanction	Filled	Vacant
Pr. Sci.	02	02	00
Scientist	02	02	00
Administrative	08	05	03
Technical	02	00	02
SSS	Nil	--	--

Krishi Vigyan Kendra

KVK operates as a district-level organization with the primary purpose of coordinating implementing and facilitating frontline extension activities. It plays a vital role in evaluating and refining agricultural technologies while also disseminating knowledge and technology developed by universities and research institutes. KVKs are instrumental in providing essential agricultural inputs and offering one-point solutions to the diverse farming challenges faced by farmers. Furthermore, they extend technical support to State and Central Government Agencies involved in agricultural research, development, and extension efforts. Additionally, KVKs actively participate in the implementation of various district-level schemes initiated by the Central and State Governments. Recently, KVKs have also been entrusted with the responsibility of implementing several National Flagship Programs, expanding their reach and impact even further.

State-Wise Distribution of KVK

Within this zone, there are a total of 68 KVKs, with 44 located in Bihar and 24 in Jharkhand. When categorized by host organizations, the distribution reveals that 54 KVKs operate under State Agricultural Universities (SAU) and Central Agricultural University (CAU), 04 KVKs operate under the Indian Council of Agricultural Research (ICAR), 09 KVKs are managed by Non-Governmental Organizations (NGOs), and 01 KVK is under the supervision of a State Government undertaking., as detailed below in the following Table 2.

Table 2: State wise distribution of KVK.

Name of states	No.of districts	No.of KVKs					Total
		SAU	CAU	ICAR	NGO	SDA	
Bihar	38	23	16	01	04	00	44
Jharkhand	24	16	-	03	05	01	24
Total	62	38	16	04	09	01	68

ICAR – Indian Council of Agricultural Research, SAU – State Agricultural University, CAU- Central Agricultural University, NGO– Non-Governmental Organization, SDA- State Department of Agriculture, DU- Deemed University, NGOs are S.K. Chaudhary Educational Trust, Madhubani, Vanavasi Seva Kendra, Bhabhua, Kaimur, Gram Nirman Mandal, Nawada, Samata Seva Kendra, Sitamarhi, Ram Krishna Mission Ashram, Ranchi,Cross, Hazaribag, Vikas Bharati, Gumla, Santhal Paharia, Deoghar, Garmin Vikas Trust, Godda.

Manpower

Every KVK is allocated a staff strength of 16, which comprises 01 Senior Scientist and Head, 06 Subject Matter Specialists (SMS), 03 Programme Assistants, 02 Administrative Staff, 02-Drivers and 02 Supporting Staff. Consequently, the total sanctioned staff for all 68 KVKs amounts to 1088.

Table 3: Staff Position of KVKs

S.No.	Sanctioned Posts	Bihar		Jharkhand		Grand Total	
		No. of Sanctioned Post	No. of Filled Post	No. of Sanctioned Post	No. of Filled Post	No. of Sanctioned Post	No. of Filled Post
1	Senior Scientist & Head	43	41	23	10	66	51
2	Subject Matter Specialist	258	173	138	78	396	251
3	Programme Assistant	43	23	23	11	66	34
4	Computer Programmer	43	25	23	8	66	33
5	Farm Manager	43	20	23	14	66	34
6	Accountant / Superintendent	43	36	23	4	66	40
7	Stenographer	43	31	23	6	66	37
8	Driver	86	74	46	15	132	89
9	Supporting Staff	86	40	46	11	132	51
	TOTAL	**688**	**463**	**368**	**157**	**1056**	**620**

Budget Provision

Based on the assessment of the submitted budget requirements, the process of budget provisions involves placing a demand for funds, receiving the allocated funds, and subsequently releasing them. In the financial year 2023-24, an amount of Rs.10583.28 Lakh was released to this Institute from the Indian Council of Agricultural Research (ICAR) Headquarters (as shown in Table 4). These funds were allocated for the functioning of 68 KVKs and 4 Directorates of Extension Education (DEE) affiliated with the State Agricultural Universities (SAUs) in this Zone.

Table 4: Budget for ATARI Zone IV during 2023-24

Associated Institution	Salary	General			Capital			
		Main	TSP	SCSP	Main	TSP	SCSP	G.Total
BAU Sabour	2865.45	285.27	16.45	23.50	8.94	37.84	39.00	3276.45
DRPCAU Pusa	2011.23	174.63	5.28	23.88	258.96	8.16	31.25	2513.38
BASU Patna	129.29	8.90	5.00	3.00	0.00	12.00	2.50	160.68
BAU Ranchi	2134.73	126.12	42.11	10.00	0.00	123.23	14.00	2450.18
NGO, Bihar	469.15	49.38	0.00	9.63	0.00	0.00	13.25	541.40
NGO, Jharkhand	699.32	46.05	17.17	4.50	0.00	44.77	3.75	815.55
ICAR-RCER, Patna	184.59	15.46	4.50	4.25	0.00	12.00	3.00	223.80
ICAR-NRRI Cuttact	92.83	5.54	0.00	1.25	0.00	0.00	2.25	101.87
ICAR-IINRG, Ranchi	3.84	2.94	4.50	0.00	8.67	16.00	0.00	35.95
Grand Total	**8590.42**	**714.29**	**95.00**	**80.00**	**276.56**	**254.00**	**109.00**	**10119.27**
ATARI, RE 2022-23	229.58	49.99	0.00	0.00	184.44	0.00	0.00	464.01
KVKs RE 2022-23	8590.42	714.29	95.00	80.00	276.56	254.00	109.00	10119.27
Total RE2022-23	**8820.00**	**764.28**	**95.00**	**80.00**	**461.00**	**254.00**	**109. 00**	**10583.28**

Revolving Fund

In order to ensure the self-sufficiency of KVK farms in terms of resource generation, a revolving fund has been provided to all KVKs as initial seed money. This fund empowers them to undertake various income-generating activities, including seed and sapling production, fish farming in ponds, establishment of horticulture orchards, and other initiatives aimed at enhancing the overall capabilities of the farms. In Zone-IV, where the revolving fund scheme is implemented, the 68 KVKs reported a cumulative net balance of Rs. 74726.56as of January 1, 2024. In the year 2022, the KVKs in Zone-IV generated a significant amount of Rs. 315501.40through the revolving fund scheme. In terms of state distribution, the KVKs in Bihar generated Rs. 788.17 lakhs, while the KVKs in Jharkhand generated Rs.314713.23lakhs through this scheme in 2023. A detailed status of the revolving fund of KVKs under Zone IV is presented in Table .

Table : Status of operating revolving scheme by the KVKs in lakhs

State	Year	Opening balance on 1st January	Income during year	Expenditure during year	Net balance in hand (Cash + Kind) as on December
Bihar	2019 -20	773.31	452.98	410.95	815.34
	2020	899.88	441.89	483.42	778.05
	2021	1,045.14	404.13	346.62	1,143.12
	2022	982.07	519.35	487.53	1,122.49
	2023	1365.78	788.17	601.47	1581.50
Jharkhand	2019 -20	206.17	143.59	111.97	237.79
	2020	271.46	129.30	112.11	174.68
	2021	202.88	103.40	73.51	215.56
	2022	208.33	74.16	71.77	212.71
	2023	87990.74	314713.23	329558.44	73145.06
Total	2019 -20	979.48	596.57	522.92	1,053.13
	2020	1,171.34	571.19	595.53	952.73
	2021	1,248.02	507.53	420.13	1,358.68
	2022	1,190.40	593.50	559.30	1,335.20
	2023	89356.52	315501.40	330159.91	74726.56

To facilitate the achievement of its defined goals, the KVKs have been equipped with various infrastructure amenities. These include an administrative building, farmers' hostel, staff quarters, demonstration units, soil and water testing laboratories, rainwater harvesting structures with micro-irrigation facilities, portable carp hatchery units, IFS models, E-connectivity, technology information units, vehicles, and more. The KVKs primarily utilize these facilities to enhance the skills and knowledge of farmers, showcasing the advantages of effective management practices. The details of infrastructure facilities available with the KVKs are given in Table 6.

Table 6: State-wise details of infrastructure available with KVKs

Infrastructure available	Bihar	Jharkhand	Total
Administrative building	36	23	59
Farmers hostel	36	19	55
Demonstration units	182	91	273
Staff quarters	160	90	250
Rain water harvesting structure	04	14	18
Soil water testing labs	26	18	44
Minimal processing facilities	9	04	13
Carp hatchery	14	02	16
Integrated farming system unit	26	13	39
se-linkages facilities	12	05	17
Technology formation unit	07	07	14
Micro nutrient analysis facilities	03	04	07
Solar panel	13	11	24

Flagship Programmes

Besides performing its regular mandated activities, KVKs are also encouraged to get them involved in a number of programs depending on the farmer's need of the district and technical capability of the KVKs to contribute towards growth of agriculture and allied sectors. Some of the flagship Programs which were undertaken by different KVKs of the zone are as follows:

- National Initiatives Climate Resilient Agriculture-Technology Demonstration component (NICRA-TDC)
- Attracting and Retaining Youth in Agriculture (ARYA)
- Cluster Front Line Demonstration (CFLD) on Pulses and Oilseeds
- Farmer FIRST Programme (FFP)
- Out Scaling of Natural Farming through Krishi Vigyan Kendra's
- Tribal Sub Plan (TSP)
- Scheduled Caste Sub Plan (SCSP)
- Seed Hub
- Agri-Drone project
- New Extension Methodology and Approaches (NEMA)
- Nutri-Sensitive Agricultural Resources and Innovation (NARI)
- Formation and promotion of Farmer Producer Organization (FPO) by KVKs
- District Agro Meteorological Unit (DAMU)
- CSISA-ICAR Collaborative Project Phase-III(CSISA)

1. Krishi Vigyan Kendra Banka

Thematic area: Integrated Nutrient Management

Problem diagnosed: Excessive use of chemical fertilizers and spiraling price of urea leads to increase in cost of cultivation

Technology Assessed: Assessment of nano urea for nitrogen use efficiency in rice

Result: Paddy is an important crop of Banka district covering 104794 ha area. Excessive use of chemical fertilizers and spiraling price of urea leads to increase in cost of cultivation is main problem facing by farmers. KVK, Banka has conducted On Farm Testing on Improvement of nitrogen use efficiency in rice. In the assessed 50% of RDN and 100% PK + Nano urea @4ml/lt. water (single spray at pre flowering stage and 50% of RDN(T_1) and 100% PK + 2 sprays of Nano urea at (25 to 30 days) and (60-65 days) @ 4 ml/lt water(T_2). Result of assessment shows that 43.74 q/ha yield from $T_2$and 39.75 q/ha from farmers practice was observed and 10.03 percent yield was increased over farmer practice. Net return of Rs57209.00 per ha with B:C ratio 2.49 from T_2 and Rs 50024.00 per ha with B:C ratio 2.36 from farmer practice was recorded. Farmers get additional return around Rs.6100 per ha.

Table: Improvement of nitrogen use efficiency in ricein Kharif

Treatments	No. of Trials	Yield (q/ha)	% yield Increased	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs. /ha)	BC ratio
Farmer Practice	7	39.75	-	36750.00	86774.00	50024.00	2.36
TO1(50% of RDN and 100% PK + Nano urea @4ml/lt. water (single spray at pre flowering stage))		42.13	5.98	37375.00	91970.00	54595.00	2.46
TO2(50% of RDN and 100% PK + 2 sprays of Nano urea at (25 to 30 days) and (60-65 days) @ 4 ml/lt water)		43.74	10.03	38275.00	95484.00	57209.00	2.49

2. Krishi Vigyan Kendra Katihar

Thematicarea: Integrated Nutrient Management

Technology assessed: Assessment of nitrogen use efficiency in wheat

Result: Wheat is an important crop of Katihar district covering 19186 ha area excessive use of chemical fertilizer and spiraling price of urea increase in cost of cultivation is problem facing by farmers. KVK, Katihar has conducted On Farm Testing on Improvement of nitrogen use efficiency in wheat. It was applied result of assessment shows that 40.18 q/ha yield from T_2 as compared to farmers practice (35.19 q/ha) and 14.18% yield was increases over farmers' practice. Rs. 50762 net return per ha with B:C ratio 2.68 and net return Rs. 42257 per ha and B:C ratio 2.47 was recorded from assessment and farmers practice respectively.

Table:Improvement of nitrogen use efficiency in wheat

Treatment	No. of trials	Yield (q/ha)	% yield increased over farmer practice	Cost of cultivation (RS/ha)	Gross return (Rs. /ha)	Net return (Rs. /ha)	B:C ratio
FP	**10**	35.19	--	28651	70908	42257	2.47
TO1		38.77	10.17	29860	78181	48321	2.62
TO2		40.18	14.18	30200	80962	50762	2.68

3. Krishi Vigyan Kendra Khagaria

Thematic area: Insect Pest Management

Technology Assessed: Assessment of management practices for Red Banded Caterpillar in mango

Mango is an important fruit crop of Khagaria district covering 18.6 ha area. Among all the other factors of low production of mango Red Banded Caterpillar is major one. Keeping in view the same KVK Khagaria has conducted on Farm Testing on management practices for Red Banded Caterpillar in mango. In the assessed TO_1, spray chlorpyriphos as and when problem symptoms appear, TO_2 deltamethalin 2.8 EC@1ml/lit at marble size and repeat after two weeks, TO_3 spray twice of Thiacloprid 21.7 SC 0.04 % @2 ml/lit of water at 25-30 days interval. Result of assessment shows that 512.50 q/ha yield, incidence % 2.78, net return Rs 263550.00/ha and BC ration is 5.9 found most effective in comparison to treatment 2.

Table 00: -Management practices for Red Banded Caterpillar.

Treatment	No. of Trials	Yield (q/ha)	% Increase in yield	% Incidence	% Reduction	GC Rs. /ha	GR Rs. /ha	NR Rs. /ha	B:C Ratio
FP	08	350.60	-	13.90	-	46580	210360	163780	3.51
TO_1		425.18	46.22	6.58	52.66	44850	255108	210258	4.68
TO_2		512.50	92.50	2.78	80.00	43950	307500	263550	5.9

4. Krishi Vigyan Kendra Araria

Thematic area: Integrated pest management

Problem diagnosed: Insect pests of Makhana damage the crop and reduce the yield widely.

Technology Assessed: Assessment of IPM Module in Makhana cultivation.

Makhana is identified as one district one crop of Araria district in Bihar covering area of 4000 ha, the low yield of which is the main problem due to effect of pests and their management by the indiscriminate use of chemical pesticides. KVK Araria has conducted On Farm Testing on the integrated management of pests in Makhana during 2023. Technology Option TO_1 comprising of seed treatment by Imidacloprid 70 WG@ 2g/kg followed by the root dip in solution of Imidacloprid 70 WG@ 2g/liter water for half an hour at the time of transplanting and thereby 3 foliar spray of NSKE @ 5% at 25 days interval starting from 40 DAT and TO_2 comprising of seed treatment by Thiomethoxam 25 WG @ 5 g/kg followed by the root dip in solution of Thiomethoxam 25 WG@ 5g/liter water for half an hour at the time of transplanting and thereby 3 foliar spray of NSKE @ 5% at 25 days interval starting from 40 DAT were assessed in comparison of farmers practice using only Chlorpyrifos @ 1.5-2.0 liter/ha. Result of the assessment showed the best performance in TO_2 with minimum 9.11 % incidence of insect and pest and maximum increase of seed yield by 26.53%, net-return of Rs.2,55,200/ha and B:C Ratio of 2.33 followed by TO_1 with 12.5 % incidence of insect and pest and increase of seed yield by 15.31%, net-return of Rs.2,24,400/ha and B:C Ratio of 2.23. Farmers get additional net return of Rs. 70,000/ha in TO_2 and 39,200/ha in TO_1 in comparison of farmers practice.

Table: Performance of Management options of insect pest in Makhana crop

Treatments	Replication	% Increase in Yield	% Incidence of Insect Pest	Yield Qt./ha	Cost of Cultivation (Rs. /ha)	Gross Return (Rs. /ha)	Net Return (Rs. /ha)	B:C Ratio
FP	10		38.60	19.80	1,71,200	3,56,400	1,85,200	2.08
TO_1		15.31	12.50	22.60	1,82,400	4,06,800	2,24,400	2.23
TO_2		26.53	9.11	24.80	1,91,200	4,46,400	2,55,200	2.33

5. Krishi Vigyan Kendra Sheohar

Thematic Area: Integrated Disease Management

Technology Assessed:Assessment of management practices for Red banded caterpillar in Mango

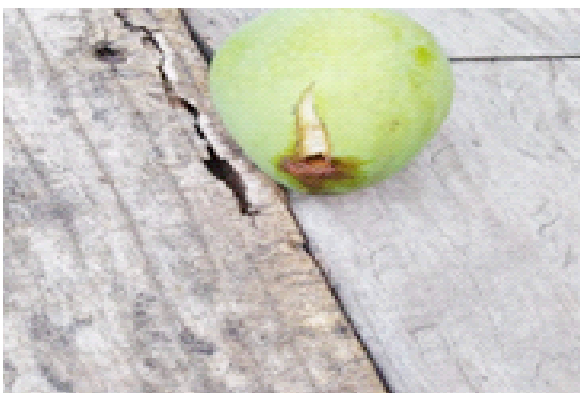
An experiment conducted at KVK, Sheohar on Assessment **of management practices for Red banded caterpillar in Mango** in Harnahi village of the district, on the basis of first year observations and data record technology no.02 Thiacloprid 21.7 SC 0.04 %**2ml/lit** has been shows best result in given table the maximum caterpillar infestation was recorded in farmer's practice (32.89%) and lowest infestation was in thiacloprid (17.57%). In respect of yield and yield attributes in table 02, the yield has increase in over control was largest (6.1 kg/ plant) in thiacloprid treatment technology option 02 and it's followed by deltamethrin (3.8 kg/plant) technology option 01 as well as farmers practice (3.2kg/tree. In case of B:C ratio significant trend also reviled like yield. Experiment will be continuing this year.

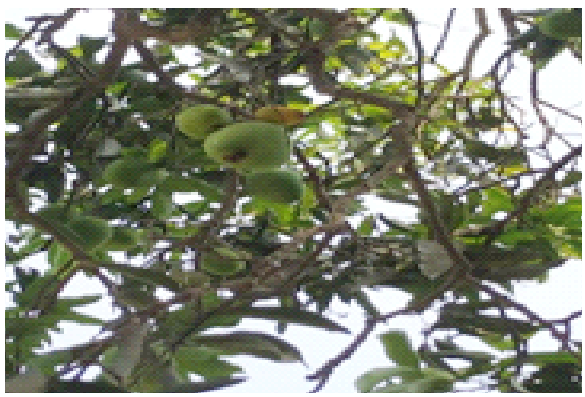
Table 00: Bio efficacy of different insecticides on red banded caterpillar of mango

SI. No.	Treatment	Dosage (ml/Lit)	Fruit infestation 10 days after each spray (%)		Mean fruit infestation (%)
			I Spray	II Spray	
1.	**Deltamethrin 2.8 EC**	1ml/lit	24.63 (29.74)	19.02 (24.99)	21.83 (27.36)
2.	**Thiacloprid 21.7 SC 0.04 %**	2ml/lit	21.52 (27.63)	13.62 (21.61)	17.57 (24.62)
3.	**Farmer's practice**	2ml/lit	35.82 (36.74)	29.95 (33.16)	32.89 (34.95)
	Mean		27.32 (31.37)	20.86 (26.59)	
	CD (0.05) Treatment (T)	1.39			
	Spray interval (I)	0.67			
	TxI	2.31			

Table 00: Benefit-cost ratio of insecticides application against red banded caterpillar of mango

Treatments	Mean yield (kg/ plant)	Increase in yield over control (kg)	Cost of Increased yield @ Rs20 /kg	Cost of the test treatment (Rs)	Net Monetary return (Rs)	B:C (BCR)
Deltamethrin 2.8 EC	9.7	3.8	76	4.8	72.1	15.02:1
Thiacloprid 21.7 SC 0.04 %	11.6	6.1	122.66	6.14	116.52	18.98:1
Farmer's practice	8.7	3.2	64.66	4.8	59.86	12.47:1





6. Krishi Vigyan Kendra Gopalganj

Thematic area: Resource Conservation Technology

Technology Assessed: Assessment of Happy seeder for wheat sowing under crop residue Management.

Results: In an on-farm trial conducted to assess the happy seeder for wheat sowing under crop residue management, eight different locations in Gopalganj district of Bihar were chosen. The results revealed that the technology option 1 (TO1), involving sowing of wheat by happy seeder incorporating crop residue, demonstrated superior outcomes. It recorded higher values for effective tillers/hill (15.2), grains/ear head (40.0), test weight of grain for 100 seeds (3.86 grams), and yield of wheat (33.8 q/ha) compared to technology option 2 (TO2), which involved the removal of crop residue and sowing by Zero till drill. In TO1, the highest net return (41416) and benefit-cost ratio (2.36) were observed in comparison to TO2. Noteworthy differences in the number of grains, grain weights, and wheat yield were noted between the technology options and traditional farmer practices. Despite statistical non-significance between TO1 and TO2, TO1 emerged as the preferred option in terms of yield (33.8 q/ha) and benefit-cost ratio (2.36).

Table: Assessment of Happy seeder and zero till drill on yield & economics of wheat sowing

Technology option	Yield Component			Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (q/ha)	Net Return (Rs/ha)	BC ratio
	No. of effective tiller/hill	No. of grain per ear head	Test wt. grain (100 seed), gram					
FP:Broadcasting (In tilled conditions)	10.6	30 [a]	2.98[a]	29.8[a]	32714	63325	28611	1.82
TO1: Sowing of wheat by happy seeder incorporating the crop residue	15.2	40 [b]	3.86[b]	33.8[b]	30409	71825	41416	2.36
TO2: Removal of crop residue and sowing by Zero till drill	12.8	38 [b]	3.66[b]	32.5[b]	29804	69062	39258	2.32
SEm ±		1.468	0.033	0.689				
CD at 5%		4.496	0.101	2.109				

7. Krishi Vigyan Kendra Begusarai

Thematic area: Natural Resource Management

Technology Assessed: Assessment of Cut Off ratio in Wheat irrigation

Results: On-farm trial for assessment of Cut Off ratio in Wheat irrigation was conducted at 7 different locations in Begusarai district of Bihar. The results showed that the yield of wheat (36.20 q/ha) was recorded highest in TO_1 (Irrigation at 90% cut off). TO_1 also conferred the highest net return (45851) and B:C ratio (2.48) as compared to TO_2 (Irrigation at 80% cut off) and Farmer's practice. It was also observed that water use can be lowered up to 22.38% if irrigation is stopped at 90 % cut off; whereas at 80 % cut off water saving was observed 28.57%. Therefore, the TO_1 was found to be more efficient than TO_2. So, the TO:1 may be the best option for the wheat production.

Table 00: Effect of cut off irrigation on yield and economics of wheat.

Technology option	Water supplied (cubic meter/ ha)	Water Saving (cubic meter/ha)	Yield (q/ha)	Cost of cultivation (Rs. /ha)	Gross return (Rs/ha)	Net return (Rs. /ha)	BC ratio
FP: 100% irrigation	2100	-	34.56	33200	73440	40240	2.21
TO_1: Irrigation at 90% cut off	1630	470	36.20	31074	76925	45851	2.48
TO_2: Irrigation at 80% cut off	1500	600	33.87	30945	71974	41029	2.33

8. Krishi Vigyan Kendra Saharsa

Thematic area: Natural Resource Management

Problem diagnosed: Excess water during irrigation affects the plant growth resulted into decrease in productivity, therefore, decrease in benefit cost ratio.

Technology Assessed: Assessment of Cut Off ratio in wheat irrigation

Wheat is an important crop of Saharsa district, taken in Rabi season, covering an area of 49690 ha. Due to undulating topography of the fields in Koshi region and soil structure. it is observed that farmers practice to use excess water to irrigate the crop for covering whole field irrigated. This practice of irrigation resulted into damage of plants, therefore, there is decrease in productivity and thus a decrease in benefit cost ratio is found. KVK Saharsa has conducted an On-Farm Trail to access the cut of ratio of irrigation in wheat crop. Two cut off ratio of irrigation practices viz Irrigation at

90% cut off and Irrigation at 80 % cut off had been taken to evaluate their effects on productivity of wheat crop against the farmers practice of irrigation where 100% field was covered under irrigation. It was observed during the trial that the highest yield of 37.8 q/ha was found in the field where irrigation at 90% cut off was practiced for irrigation with the highest B:C ratio of 2.30. It was found that there was an increase of 10.2% in yield where irrigation at 90% cut off was used in comparison to farmers practice of irrigation. The net return is also the highest (Rs. 43890/ha) where irrigation at 90% cut off was practiced.

Table 00: Cut Off ratio in wheat irrigation

Technology option	Treatment	No. of Irrigation	Water applied (m^3/ha)	Water saving m^3/ha (%)	No. of Effective tillers/hill	No. of grains per panicle	Sample weight: 100 grain wt. (g)	Yield (q/ha)	Cost of cultivation (Rs. /ha)	Gross Return (Rs. /ha)	Net Return (Rs. /ha)	B:C ratio
FP	100 % Irrigation	3	2250	-	11.4	35.6	3.8	34.3	35200	70315	35115	1.99
TO_1	Irrigation at 90% cut off	3	1768	482 (21.42)	14.3	38.3	4.2	37.8	33600	77490	43890	2.30
TO_2	Irrigation at 80 % cut off	3	1596	654 (29.07)	12.8	35.3	3.7	34.2	32850	70110	37260	2.13

9. Krishi Vigyan Kendra Saraiya

Thematic area: Farm Machinery

Technology assessed: Assessment of different weeding tools in paddy crop

Results: Weeds pose significant challenges in paddy production, with herbicides being a quick but environmentally and human health-adverse solution. To address these concerns, mechanical weeding, particularly using a modified power weeder, was tested for upland paddy at 20 and 45 days after sowing (DAS). The modified power weeder exhibited the highest Weeding Efficiency at 85.90% and 93.58% at 20 and 45 DAS, respectively, proving efficient and fuel-friendly (0.63 to 0.73 l/h). It performed comparably to the Cono weeder with weeding efficiencies of 62.04% and 72.36% at 20 and 45 DAS. The power weeder demonstrated cost-effectiveness at ₹1050/- per

hectare, contrasting sharply with Cono weeder costs of ₹5040/- and ₹4672/- at 20 and 45 DAS. Hand weeding excelled in efficiency but incurred higher operational costs.

Table: Performance of Mechanical and Hand Weeding Methods and Economic Field Comparison of Different Treatments in Paddy

Parameters		Manually by local hand tools (T1)	Manual inter culturing with Cono Weeder (T2)	Inter culturing with power weeder (T3)
Weed population (for 20 DAS(No./m2)	Before weeding	227	137	178
	After weeding	32	52	47
Weeding Efficiency 20 DAS		85.90	62.04	73.60
Weed population (for 20 DAS(No./m2)	Before weeding	187	123	167
	After weeding	12	34	23
Weeding Efficiency 20 DAS		93.58	72.36	86.23
Effective field capacity (ha/h)			0.012	0.065
Man hours (h/ha)	20 Das	227	96	17
	40 Das	212	89	16
Cost of operation	20 Das	11917.50	5040.00	1050.50
	40 Das	10530.00	4672.50	940.00
Yield Qt./ha		38.75	42.86	46.87
Cost of Cultivation		41500	40500	38700
Gross Income		84591.25	93563.38	102317.2
Net Income		43091.25	53063.38	63617.21
B:C Ratio		1.04	1.31	1.64

10. Krishi Vigyan Kendra Saraiya

Thematic area: Farm Machinery

Technology Assessed: Assessment of low-cost Mulching in Vegetable Crop production

Results: The Results shows that banana leaf mulch had the highest yield per hectare (168.82 q/ha) compared to no mulch (127.69 q/ha) or crop residue mulch (156.48 q/ha). It also had the highest increase in yield (24.36%), followed by crop residue mulch (18.40%) and then no mulch (0%). The cost of cultivation was highest for banana leaf mulch (92000 Rs/ha), followed by crop residue mulch (89600 Rs/ha) and then no mulch (88560 Rs/ha). The gross return was highest for banana leaf mulch (303876 Rs/ha), followed by crop residue mulch (281664 Rs/ha) and then no mulch (229842 Rs/ha). The net return was also

highest for banana leaf mulch (211876 Rs/ha), followed by crop residue mulch (192064 Rs/ha) and then no mulch (141282 Rs/ha). The benefit cost ratio was highest for banana leaf mulch (2.30), followed by crop residue mulch (2.14) and then no mulch (1.60).

Table: Assessment low-cost Mulching incorporation on yield &economics of Vegetable Crop production.

Treatments	Yield q/ha	Increase in yield	Result: Cost of cultivation	Gross return (Rs./ha)	Net Return (Rs./ha)	BC Ratio
No mulch	127.69	Nil	88560	229842	141282	1.60
Banana leaf mulch	168.82	24.36	92000	303876	211876	2.30
Crop Residue mulch	156.48	18.40	89600	281664	192064	2.14

Table: Soil temperatures: Soil temperature (°C) at 5 cm depth

Treatments	3 days after sowing			30 days after sowing			60 days after sowing		
	8:00 AM	12:00 PM	5:00 PM	8:00 AM	12:00 PM	5:00 PM	8:00 AM	12:00 PM	5:00 PM
FP: No mulch	14.27	18.12	17.08	17.25	19.42	18.54	21.25	24.45	23.45
TO1: Banana leaf mulch	16.35	20.35	19.13	20.24	22.52	21.85	24.56	28.54	27.14
TO2: Crop Residue mulch	15.84	19.25	18.14	19.85	20.54	20.12	22.84	26.85	25.56

Table: Soil moisture: 15 cm Depth:

Treatments	Soil moisture (%)15 cm Depth	Percent soil moisture increased
FP: No mulch	9.85	-
TO1: Banana leaf mulch	13.65	22.65
TO2: Crop Residue mulch	12.24	18.35

Table: Total weed density (numbers of weeds per square meter):

Weed count (No. of weeds/ m^2)		
Treatments	30 days	60 days
FP: No mulch	68	74
TO1: Banana leaf mulch	24	48
TO2: Crop Residue mulch	35	56






11. Thematic area: Integrated Disease management

KVK: East Champaran II, Lakhisarai, Nalanda, Nawada, Rohtas, Samastipur I, Saran, East Singhbhum, Jamtara, Koderma and Ranchi

Problem diagnosed: Higher wilt incidence in tomato

Title: **Assessment of microbial consortia against wilting in Solanaceous crop (Tomato)**

Technological options: FP- Farmers Practices; TO_1- Arka microbial consortia; TO_2- NRCL consortia

Results: To assess the performance of microbial consortia against wilt incidence in Tomato in an OFT was conducted in 11KVKs during *Rabi* season in 2023-24. The result revealed that wilting percentage at 75 days after transplanting (DAT) ranged from 19.22 to 54.00 % under farmers practices condition. Highest wilting was recorded in East Singhbhum (54 %) followed by Koderma (44.32) and Jamtara district (32.24). Minimum wilting percentage at 75 DAT was recorded in Jamtara (6.68) followed by 7.09 in Nawada, 7.15 in East Champaran II under NRCL consortia. Overall, among consortia performance of NRCL was performed better than IIHR Arka consortia (table 1). Data from KVK Rohtas reported significantly highest Tomato yield (846 q/ha) in both the Technological options in comparison to other KVKs with variety Kashi Vishesh followed by KVKs East Champaran II with their values 563 q/ha under variety Kashi Aman. However, the minimum yield in Technological options reported in Farmer practices is 175 q/ha by KVK Jamtara and 220 q/ha under Technological options by KVK Jamtara, East Singhbhum and Koderma. However, the highest B:C ratio was recorded in

Table 01: Assessment of integrated disease management under microbial consortia against wilting in Brinjal on yield and economics

Name of KVK	Variety	Wilting at 75 DAT			Yield (q/ha)			Cost of cultivation(q/h)			Gros return			Net return			B :C		
		FP	TO_1	TO_2	FP	TO_1	TO_2	FP	TO_1	TO_2	FP	TO_1	TO_2	FP	TO_1	TO_2	FP	TO_1	TO_2
East Champaran II	Kashi Aman	30.29	10.14	7.15	456	563	574	142580	142150	137010	456110	563300	574570	313540	421160	437560	2.24	2.96	3.19
Lakhisarai	Kashi Vishesh	19.22	14.31	16.36	290	328	319	105332	107975	107700	365463	413663	402900	260131	307438	295200	3.42	3.8	3.7
Nalanda	Kashi Vishesh	30.43	13.55	19.64	286	351	316	63250	67950	66450	169800	230150	208600	106550	162200	142150	2.68	3.38	3.13
Nawada	Kashi Aman	19.10	11.50	7.09	226	258	290	115700	120700	120700	406800	464220	523260	362875	413289	479675	3.52	3.85	4.34
Rohtas	Kashi Vishesh	28.35	12.65	14.53	690	846	813	147625	154225	154225	481500	592000	569250	333875	437775	415025	3.26	3.83	3.09
Samastipur I	Kashi Adarsh	31.00	18.78	21. 54	265	348	308	42789	59812	55641	159066	278664	246496	116277	218852	190855	2.71	3.65	3.43
Saran	Kashi Aman	31.10	27.00	31.05	347	442	402	127345	143501	136342	347050	442575	402150	219705	299075	265808	2.73	3.08	2.95
East Singhbhum	Karishma	54.00	9.10	33.8 0	300	460	220	115000	110000	110000	300000	460000	220000	185000	350000	110000	2.72	4.18	2
Jamtara	Swarna Vaibhav (F1)	32.24	7.35	6.68	175	220	280	85000	87375	91000	175000	220000	290000	90000	132625	189000	2.05	2.05	3.07
Koderma	Rakshhak F1	44.32	17.65	21. 10	180	242	220	62500	72500	71000	126000	217800	198000	63500	145300	127000	2.01	2.01	2.78
Ranchi	Swarna Vaibhav (F1)	26.69	16.35	18.30	256	435	380	87500	88250	88000	281600	504600	429400	194100	416350	341400	2.22	2.22	3.88

Nawada District (4.34) with the variety Kashi Aman and the lowest B:C ratio was recorded in East Singhbhum District (2.00) with the variety Karishma.

12. Krishi Vigyan Kendras: Vaishali, Sheohar, West Champaran, East Champaran I, Muzaffarpur II, Gumla, Bokaro, Godda and Palamu

Thematic area: Integrated Disease Management

Problem diagnosed: Wilt persisted as the major biotic stress in Brinjal

Title: Assessment of microbial consortia against wilting in solanaceous crop (Brinjal)

Technological options: FP- Farmers Practices; TO_1- Arka microbial consortia; TO_2- NRCL consortia

Results: To assess the performance of microbial consortia against wilt incidence in Brinjal an OFT was conducted in 9 KVKs during *Rabi* season in 2023-24. The result revealed that wilting percentage at 75 days after transplanting (DAT) ranged from 21.22 to 61.50% under farmers practices condition. Highest wilting (61.50%) was recorded in Muzaffarpur II followed by Godda (54.50) and Vaishali district (44.40), whereas, minimum wilting percentage at 75 DAT was recorded in Gumla (6.53) followed by 6.99% in East Champaran I, 7.29 % in Muzaffarpur II and 7.90 % in Bokaro under TO_2 (NRCL consortia). Overall performance of NRCL consortia was better than IIHR Arka consortia (Table). KVK

East Champaran I had significantly highest Brinjal yield (573 q/ha) in TO_2 (NRCL consortia) in comparison to other KVKs with same variety i.e., Kashi Sandesh followed 343q/ha under variety Pusa purple Long by KVK Sheohar. Highest B:C ratio (5.47) with the variety Pusa Purple Long was recorded in Sheohar and the lowest B:C ratio (2.29) in variety Kashi Sandesh at Vaishali.

Table 01: Assessment of integrated disease management under microbial consortia against wilting in Brinjal on yield and economics

Name of KVK	Variety	Wilting at 75 DAT			Yield (q/h)			Cost of cultivation (q/h)			Net return			B:C		
		FP	TO1	TO2	FP	TO1	TO2	FP	TO1	TO2	FP	TO1	TO2	FP	TO1	TO2
Vaishali	Kashi Sandesh	44.40	21.30	18.50	174.00	218.00	235.00	84965	87456	92325	68540	113044	127574	1.80	2.29	2.38
Sheohar	Pusa Purple long	25.77	17.12	19.04	262.00	343.00	300.00	69000	69000	69000	193880	377641	261847	2.81	5.47	3.79
West Champaran	Kashi Sandesh	28.57	17.45	14.82	242.00	314.00	287. 00	65500	64500	64500	128708	187036	165372	2.96	3.90	3.60
East Champaran I	Kashi Sandesh	29.50	11.02	6.99	546.00	569.00	573.00	177900	176000	170000	368311	392975	403012	3.07	3.23	3.37
Gumla	Swarna Pratibha	21.22	11.46	6.53	163.00	171.00	217.00	60500	65500	70500	103456	139568	190068	2.71	3.13	3.69
Bokaro	S-32	36.40	8.70	7.90	164.00	216.00	226.00	61000	65000	69000	103000	151000	157000	2.68	3.32	3.27
Godda	Navkiran	54.50	27.70	26.40	106.00	171.00	174.00	93600	97500	96900	66450	158700	165000	1.71	2.62	2.70
Muzaffarpur II	Kashi Sandesh	61.50	11.57	7.29	168.00	245.00	251.00	92446	95087	97237	61025	128254	131955	1.60	2.30	2.40
Palamu	Swarna Shyamli	33.50	17.30	21.60	181.00	232.00	226.00	63000	64938	74100	67400	120662	106700	2.07	2.86	2.44
SD		13.58	6.00	7.45	129.50	124.34	117.31							0.58	0.98	0.59

13.Krishi Vigyan Kendra Ramgarh

Thematic area: Horticulture- Fruit production

Problem definition: Low yield and quality due to inadequate nutrient management in mango

Title: Assessment of INM along with micronutrients application on yield and quality of mango cv. Amrapali

Technological options: FP: FYM @ 10 kg / tree + Urea 0.5 kg/ tree after harvest;TO_1: FYM @ 50 kg / tree + RDF (0.5:0.5:0.3 NPK Kg/ tree + 100 g zinc sulphate + 50 g boric acid + 01 kg lime (soil application) in basin after harvest) + 0.2% ZnSO4 + 0.1% boric acid - 2 foliar spray 1) before flowering and 2) at marble stage;TO_2: TO_1 with 0.1% CuSO4 - 2 foliar spray 1st before flowering and 2nd at marble stage.

Result: Highest number of flower (814) and fruit set (55.46) per panicle were observed in TO_2 which is higher than FP and TO_1.The average fruit weight (234g) and yield (8.37t/ha) were also recorded in TO_2. The highest B:C ratio was recorded in TO_2 (3.08) with net return of Rs.113064 per ha.

Table: Performance of INM doses in yield and quality of Mango

Tech. Opt.	Flower /panicle (No.)	No. of fruit set / panicle	Avg. fruit weight (g)	Fruit yield (t/ha)	Cost of cultivation (Rs./ha)	Net return (Rs. /ha)	BC ratio
FP	743.7	48.75	152.24	6.55	44800	86160	2.92
TO1	786.58	53.28	213.97	8.22	53600	110819	3.07
TO2	814.26	55.46	234.56	8.37	54400	113064	3.08



14. Krishi Vigyan Kendra Ranchi, Samastipur I and Muzaffarpur II

Thematic area: Crop Production (Bearing Regulation)

Problem definition: Litchi shows strong tendency of alternate bearing habit particularly in cv. China where profuse flowering and heavy fruit yield in on year and very negligible or no flowering and fruiting in off year of the plant is common phenomenon. Occurrence of late vegetative flushing during spring season occurred due not maturing of twigs.

Title: Regulation of bearing potential in litchi (*Litchi chinensis*) through girdling of primary branches

Technological options: FP: No girdling; **TO_1:** Circular girdling of 2 mm on 50 % primary branches (PB) during 1st week of September and **TO_2:** Circular girdling of 3 mm diameter on 50% primary branches (PB) during 1st week of September.

Result: Result presented in Table clearly indicate that in both technological options i.e. TO_1 and TO_2 circular girdling of 2 mm (TO_1) and 3 mm (TO_2) in 50% PB girdling shoot exhibit flowering panicle to the tune 34.80, 33.50 in 2mm 50% PB at Samastipur I and Muzaffarpur II KVK and 28.50% shoot flowered in Ranchi with TO_2 during off year in cv. China. 32.92 kg/plant yield was harnessed in TO_2 during the off year.

Table: Effect of girdling level on bearing of litchi shoot

Location	Ranchi		Samastipur I		Muzaffarpur II		Yield (Kg/ plant)
Bearing nature (On/ Off year)	Off	On	Off	On	Off	On	Off
FP: No Girdling	5.2	45.6	4.3	67.3	5.1	35.3	7.58
TO1: (2 mm on 50 % PB)	23.7	52.5	34.8	74.1	33.5	84.7	26.06
TO2(3 mm on 50 % PB)	28.5	67.5	31.4	71.9	30.2	82.9	32.92


15. Krishi Vigyan Kendra Begusarai

Thematic area: Animal Production and Management

Problem definition/Name of OFT: Assessment of deworming and chelated mineral mixture supplementation during prepartum period on performances of goats

1.	Title of On farm Trial (OFT)	Assessment of deworming and chelated mineral mixture supplementation during prepartum period on performances of goats
2.	Problem diagnosed	Low body weight because of a parasite burden, poor feeding practices, and mineral deficiency
3.	Details of technologies selected for assessment	Deworming and chelated mineral mixture supplementation
4.	Source of Technology (ICAR/ AICRP/SAU/other, please specify)	NDDB, Anand
5.	Production system and thematic area	Animal Production and Management
6.	Performance of the Technology with performance indicators	The results showed that the mean body weight of goats (19.17±0.70 kg) was recorded highest in TO_3 (deworming of goats (recommended dose) and supplementing mineral mixture (5g/day).
7.	Final recommendation for micro level situation	Deworming of goats (recommended dose) and supplementing mineral mixture (5g/day) may be the best option for goat rearing and production.
8.	Process of farmers participation and their reaction	Personal interaction and training

Results

Thematic area	Technology options with detailed treatments	Nos		Mean Body wt. (kg)	Cost (Rs.)	Gross return (Rs.)	Net return (Rs.)	BC ratio
		Proposed	Actual					
Animal Production and Management	FP: Farmers Practice: No deworming and mineral mixture supplementation	10	20	17.36±0.55	90406.81	173706.3	83299.48	1.92
	TO_1: Mineral mixture supplementation (5g /day)	10	20	18.85±0.77	96600.27	188514.2	91913.9	1.95
	TO_2: Deworming of goats (recommended dose) and supplementing mineral mixture (5g /day)	10	20	19.17±0.70	96811.42	191714	94902.58	1.98

16. Krishi Vigyan Kendra Chatra

Thematic area: Animal Production Management

Problem definition/Name of OFT: Slow body growth and higher mortality in goats

1.	Title of On farm Trial (OFT)	Evaluation of drugs on control of ectoparasites in Goat
2.	Problem diagnosed	Slow body growth, higher mortality
3.	Details of technologies selected for assessment	TO_1: Recommended dose: Deltamethrin @2ml/liter water solution as whole body spray and in animal houses. TO_2: Assessment: Ivermectin injection @1ml/50kg body weight (NEOMEC)
4.	Source of Technology (ICAR/ AICRP/SAU/other, please specify)	CIRG Makhdoom (UP)
5.	Production system and thematic area	Animal Production Management
6.	Performance of the Technology with performance indicators	Technical Parameters: Initial Average Body Weight of Kid. (Kg), Mortality (%), Average Body Weight of Kids (kg) after six months, Disease Infection (%)Economic Parameter: Gross Income (Rs. /ha): Net Income (Rs. /ha), B.C. Ratio.
7.	Final recommendation for micro level situation	Technology option-I and TO-II both are recommended for resource rich and resource poor Goat rearing farmers.
8.	Constraints identified and feedback for research	Resource poor farmers not use medicine for control of ectoparasite in goat. So that research system validates and improved efficacy ITK (Local available technologies) for effective control of ectoparasite in small animal.
9.	Process of farmers participation and their reaction	It is adoptive research farmers participated as a man stockholder for implementing the treatments, collection of data and interpretation. Scientist only involve as a facilitator and scientifically co-related the information. Farmers' reactions with respect to intervention technologies for knowing the choice were also measured through 5 points rating scale.

Results

Thematic area	Technology options with detailed treatments	Nos (in livestock)		Production				Cost of rearing (Total unit)	Gross return (Total unit)	Net return (Total unit)	BC ratio
		Proposed	Actual	Initial average body weight of kid. (Kg)	Mortality (%)	Average body weight of kids (kg) after six months	Disease infection (%)				
Animal Production Management	Framer's practice: (Manual picking by hand or uses comb and kill them by dipping in the water/ use of kerosene oil/BHC spray to control these Ectoparasites.)	10 Replication (10 Goats in each replication) Total-100 Goats	10 Replication (10 Goats in each replication) Total-100 Goats	2.85	40%	9.950(59.70)	20%	120000	238800	118800	1.9
	To_1: Deltamethrin @2ml/liter water solution as whole body spray and in animal houses.	10 Replication (10 Goats in each replication) Total-100 Goats	10 Replication (10 Goats in each replication) Total-100 Goats	2.95	20%	12.550(100.4)	10	125000	401600	276600	3.2
	To_2: Ivermectin injection @1ml/ 50kg body weight (NEOMEC)	10 Replication (10 Goats in each replication) Total-100 Goats	10 Replication (10 Goats in each replication) Total-100 Goats	2.90	10%	13.500 (121.500)	5	130000	486000	356000	3.73

17. Krishi Vigyan Kendra Madhepura

Thematic area: Animal Production Management

Problem definition/Name of OFT: Effect of health management practices on body weight gain in goat

1.	Title of On Farm Trial (OFT)	Effect of different management practices on body weight gain in goat.
2.	Problem diagnosed	Low body weight gain is a major problem in these locations are malnutrition, worm infestations, micronutrient deficiency which causes huge economic loss to livestock owners
3.	Details of technologies selected for assessment	To1: FP + Deworming with Albendazole @ 7.5 mg/kg body weight, (Dewormer after 3 months of age repeat at the interval of 1 month). To2: FP + Deworming + mineral mixture supplementation @ 10-15 gm per day after 3 months (4th, 5th & 6th months)
4.	Source of Technology (ICAR/ AICRP/SAU/other, please specify)	Bihar Veterinary College, Patna
5.	Production system and thematic area	Health Management
6.	Performance of the Technology with performance indicators	Body weight gain, Mortality, B:C ratio
7.	Final recommendation for micro level situation	The application of dewormer (Albendazole @ 7.5 15 gm per day for 90 days led to increase in the body weight and reduction in mortality & shining in the goats.mg/ kg body weight) and mineral mixture supplementation @ 10-
8.	Constraints identified and feedback for research	Poor economic condition, illiteracy and non-availability of medicine & feed supplement and lack of awareness among the farmers are major constraints for adopting the technology.
9.	Process of farmers participation and their reaction	1.Trainings, Meetings, Telephone advisory, Open ended questionnaire process, Field visit and animal health camp. 2.Farmers are very happy and ready to adopt the technology because supplementing material are available in the surroundings. The farmers actively participate and satisfied with technology.

Results

Thematic area	Technology options with detailed treatments	Nos		Production	Cost of rearing (Rs /unit)	Gross return (Rs /unit)	Net return (Rs /unit)	BC ratio
		Proposed	Actual					
Health Management	FP: Grazing 5-6 hrs + small amount of grains like broken rice, wheat, pulses husk etc. @ 50-100 gm per day.	10 Nos.	10 Nos.	-	585.00	840.00	255.00	1.43
	To1: FP + Deworming with Albendazole @ 7.5 mg/kg body weight, (Dewormer after 3 months of age repeat at the interval of 1 month).	10 Nos.	10 Nos.	-	620.00	1360.00	740.00	2.19
	To2: FP + Deworming + mineral mixture supplementation @ 10-15 gm per day after 3 months (4th, 5th & 6th months)	10 Nos.	10 Nos.	-	740.00	1940.00	1200.00	2.62

18. Krishi Vigyan Kendra Vaishali

Thematic area: Feed management

Problem definition/Name of OFT: Effect of feeding hydroponic wheat and maize green fodders on milk production in dairy animals

1.	Title of On farm Trial	Effect of feeding hydroponic wheat and maize green fodders on milk production in dairy animals.
2.	Problem diagnosed	Demand of more green fodder production. Farmers having no idea of producing hydroponic fodder.
3.	Details of technologies selected for assessment/ refinement	Treatments: - FP - Feed + Green fodder Tech. Opt. 1 – Feed + Hydroponic wheat production Tech. Opt. 2 – Feed + Hydroponic maize production
4.	Source of Technology	BASU, Patna
5.	Production system and thematic area	Comparative study on feeding hydroponic wheat and maize fodder, as compared to general green fodder and study on milk production.
6.	Performance of the Technology with performance indicators	Production of Hydroponic Fodder •Hydroponic fodder/ft2 was 1.83 kg and 1.05 kg from maize and wheat, respectively. •Hydroponic fodder/kg of maize and wheat grains was 5.5 kg and 4.5 kg, respectively. •The height of maize and wheat green fodders were 20 - 22 cm and 15 - 17 cm, respectively. •The green fodder, suppose in maize the 1 kg seeds give fodder in 0.10hectare area in 40 -45 da
7.	Final recommendation for micro level situation	Feeding of hydroponic fodder increases more milk production in mich cow as compared to other green fodder. Maize hydroponic fodder gave better milk production value as compared to wheat hydroponic fodder and green fodder respectively.
8.	Constraints identified and feedback for research	Technology was affordable and easy to apply in farmer's field
9.	Process of farmers participation and their reaction	Group meeting with farmers and they exhibited positive response towards the technology to be adopted

Results

Thematic area	Treatments	Area		Milk yield (cow/day) (Litre)	Feed cost per Kg milk production (Rs.)	Total cost per cow (Rs./cow /day)	Gross return from milk (Rs./cow/ day)	Net profit (Rs./cow/ day)	B:C ratio
		Proposed	Actual						
Feed management	FP	10 unit	10 unit	13.6	11.83	194.90	816	621.09	3.18
	TO1			15.3	12.33	222.93	918	695.06	3.12
	TO2			16.8	9.87	199.93	1008	808.07	4.04

19.Krishi Vigyan Kendra Gaya

Technology assessed: Assessment of production and comparative nutritive value of hydroponic wheat and maize fodder.

Thematic area: Fodder production and Management

1.	Title of On farm Trial (OFT)	Assessment of production and comparative nutritive value of hydroponic wheat and maize fodder
2.	Problem diagnosed	Due to low availability of land dairy farmers unable to grow green fodder in sufficient quantities due to this feed of animals have low nutritive value.
3.	Details of technologies selected for assessment	Assessment
4.	Source of Technology (ICAR/ AICRP/SAU/other, please specify)	DRPCAU, Pusa
5.	Production system and thematic area	Animal Production and Management
6.	Performance of the Technology with performance indicators	In this OFT production and comparative nutritive value of hydroponic wheat and maize fodder were assessed. The data in table reveals that Tech. option-II i.e., Capacity building on hydroponic wheat fodder production is more beneficial in terms of milk production (8.4 lit./d/cow) net return (Rs.13967) and BC ratio (2.60) as compared to Tech. option-I in milk production (7.8lit./d/cow) net return (Rs. 12597) and BC ratio (2.49) and FP milk production (6.4 lit./d/cow) net return (Rs. 9699) and BC ratio (2.28). Farmers get additional return around Rs.4268 per cow.
7.	Final recommendation for micro level situation	The Tech. option II i.e., Capacity building on hydroponic wheat fodder production is more beneficial in terms of milk production and net returns
8.	Constraints identified and feedback for research	NA
9.	Process of farmers participation and their reaction	Personal interaction and training

Results

Thematic area	Technology options with detailed treatments	No of units		Average Milk Yield Lit./Day/ Animal	Cost of production (Rs.)	Gross return (Rs.)	Net return (Rs.)	BC ratio
		Proposed	Actual					
Fodder production and Management	FP:No idea of producing hydroponic fodder	07	07	6.4	7581	17280	9699	2.28
	T_{O1}: Capacity building on hydroponic maize fodder production	07	07	7.8	8463	21060	12597	2.49
	T_{O2}: Capacity building on hydroponic wheat fodder production	07	07	8.4	8713	22680	13967	2.60

20. Krishi Vigyan Kendra West Champaran

Thematic area: Feed Management

Problem definition/Name of OFT: Assessment of *Azolla* feeding on milk production in dairy cow

1.	Title of On farm Trial (OFT)	Assessment of *Azolla* feeding on milk production in dairy cow
2.	Problem diagnosed	Poor availability and high cost of good quality of concentrate feeds. Fodder cultivation practice is poor.
3.	Details of technologies selected for assessment	Farmers Practice: Indiscriminate feeding of wheat and paddy straw with concentrate and mineral mixture T.O. -1: Use of *Azolla* @ 1.5kg per animal per day + 80% of required quantity of concentrate with existing fodder T.O.-2: Use of *Azolla* @ 2.0 kg per animal per day + 75% of required quantity of concentrate with existing fodder
4.	Source of Technology (ICAR / AICRP/SAU/other, please specify)	ICAR (NDRI)
5.	Production system and thematic area	Dairy Production (Dairy Animal Nutrition)
6.	Performance of the Technology with performance indicators	T.O. -2 had maximum milk production 17.5% higher than F.P. while T.O.-1 was 15% higher than F.P. T.O.-1&2 had similar 4% increase in fat percent in milk. B:C ratio 1.85 was found highest in T.O. -2.
7.	Final recommendation for micro level situation	Azolla feeding in dairy cattle @ 2.0 kg per animal per day with 75% of required quantity of concentrate and fodder.
8.	Constraints identified and feedback for research	Growth of azolla in long duration is not even. Identification of different verities of azolla on the basis of agro-climatic zones.
9.	Process of farmers participation and their reaction	Training, Method demonstration Field visit and personal communication.

Results

Thematic area	Technology options with detailed treatments (For Sixty Days)	Nos		Yield (Milk) (Kg/Cow)	Cost of cultivation (Rs./Cow)	Gross return (Rs/Cow)	Net return (Rs/Cow)	BC ratio
		Proposed	Actual					
Feed Management	FP: Indiscriminate feeding of wheat and paddy straw with concentrate and mineral mixture	10	10	6.15	11707	14760	3053	1.26
	TO1: Use of *Azolla* @ 1.5 kg per animal per day + 80% of required quantity of concentrate with existing fodder	10	10	7.07	9834	16968	7134	1.72
	TO2: Use of *Azolla* @ 2.0 kg per animal per day + 75% of required quantity of concentrate with existing fodder	10	10	7.22	9366	17328	7962	1.85

21. Krishi Vigyan Kendra Nawada

Thematic area: Disease Management

Problem definition/Name of OFT: Heavy milker cow suffer from mastitis and causes major loss in milk production

1.	Title of On farm Trial (OFT)	Assessment of feeding and local application of herbal medicine on clinical and sub-clinical mastitis
2.	Problem diagnosed	Heavy milker cow suffers from mastitis and due to mastitis major loss in milk production
3.	Details of technologies selected for assessment	All animal dewormed before starting trial FP: Hot fermentation (Washing of udder by warm water). TO_1: Herbal gel application (Lactomusti gel) five times/day for 5 days. TO_2: Herbal gel application (Lactomusti gel) five times/day for 5 days + oral herbal (Lactomust free) 80 ml orally daily for three days. Herbal gel composition:Aloevera Paste 250 gm + lemon juice (6 No.) +Neem leaf (50 gm) + Garlic paste (50 gm) +Turmeric powder (50 gm) Oral Herbal Composition:Aloevera pulp(250gm) +Lemon juice (2 No.) +Moringa leaf(50 gm)+Satavari (50gm)+Jiwanti(20gm)
4.	Source of Technology (ICAR/ AICRP/SAU/ other, please specify)	NDRI, Karnal
5.	Production system and thematic area	Micro production system & Disease Management
6.	Performance of the Technology with performance indicators	Normal consistency of Milk, Cost of feeding, Net Return, B:C ratio The result of this experiment indicated that $T.O_2$ is maximum normal milk consistency (85.68%) than $T.O_1$ (87.12%) and minimum in F.P (14.28%). In respect of net profit and B:C ratio also highest in T.O II(Rs 20816.8 and 1.94) than T.O I (Rs 16902.8 and 1.78) lowest in F.P (Rs4742.8 and 1.22).
7.	Final recommendation for micro level situation	Use of herbal gel with oral herbal is better effect on control of mastitis and higher milk production
8.	Constraints identified and feedback for research	NA
9.	Process of farmers participation and their reaction	Training & field visits

Particular	Treatment Group		
	F.P	T.O I	T.O II
No. of animal in each Trial	7	7	7
Udder condition (Inflammation and hardness)	6	2	0
Milk Colour (Straw Colour milk)	5	2	0
Normal milk consistency	1	4	6
Percent normal milk consistency	14.28	57.12	85.68
Milk PH	6.9	6.7	6.6
CMT test (+ve cow)	5	2	1
No. of day required for recovery	17	13	7

Thematic area	Technology options with detailed treatments (For 120 Days)	Nos		Total Yield (Kg)	Cost of rearing (Rs.)	Gross return (Rs)	Net return (Rs)	BC ratio
		Proposed	Actual					
Disease Management	FP: Hot fermentation (Washing of udder by warm water).	7	7	643.57+10.54	21000	25742.8	4742.8	1.22
	To1: Herbal gel application (Lactomusti gel) five times/day for 5 days.	7	7	962.57+11.08	21600	38502.8	16902.8	1.78
	To2: Herbal gel application (Lactomusti gel) five times/day for 5 days + oral herbal (Lactomust free) 80 ml orally daily for three days.	7	7	1070.42+8.92	22000	42816.8	20816.8	1.94

22. Krishi Vigyan Kendra Muzaffarpur I

Thematic area: Fish Production & Disease Management

Problem definition/Name of OFT: Assessment of efficacy of chemotherapeutics against prevalent disease in Muzaffarpur district i.e. Argulosis.

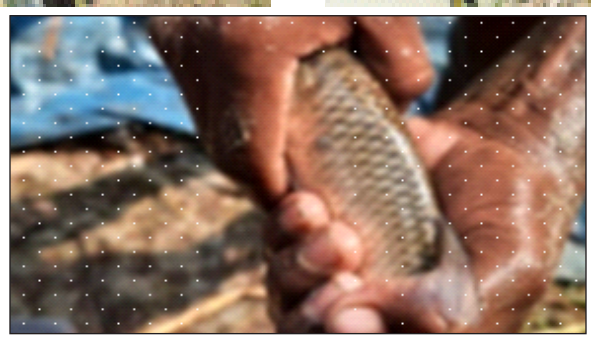
1.	Title of On farm Trial	Assessment of efficacy of chemotherapeutics against prevalent disease in Muzaffarpur district i.e., Argulosis.
2.	Problem diagnose	Argulosis causes a potential rapid escalation of infection, causing substantial economic loss to the aquaculture industry.
3.	Source of Technology (ICAR/ AICRP/SAU/other, please specify)	FP:Use of insecticide (Cypermethrine) @ 50 ml/acre/meter depth TO_1:Use of lactoclean @ 40gm/acre/meter depth TO_2:Use of CIFRI-ARGCURE @ 40ml/acre/meter depth
4.	Production system and thematic area	CIFRI, Barrackpore, West Bengal
5.	Performance of the Technology with performance indicators	Prevalence (%), Intensity of disease, Antiparasitic efficacy (%), Mortality (%)
6.	Final recommendation for micro level situation	An On-farm trial was conducted to study the efficacy of chemotherapeutics against prevalent disease in Muzaffarpur district i.e., Argulosis. Which a crustacean ecto-parasitic disease, most common and predominant disease causes serious loss to aquaculture industry. Infected fish when treated with CIFRI-ARGCURE as per technology option TO2, shows higher anti-parasitic efficacy (86.95%) than treatment option used in farmers practice FP (80.95%) and TO1 (31.70%). Mortality rate was also found to be least in technology option TO2 (10%) than treatment option used in FP (23%) and TO1 (39%). Assessment provides a significant basis for use of CIFRI-ARGCURE solution @40ml/acre/meter depth for the treatment of fishes infected with ectoparasites Argulus.
8.	Process of farmers participation and their reaction	CIFRI-ARGCURE was found more effective against Arugulas. Further research may be conducted to assess its efficacy against other fish ectoparasites.
9.	Source of Technology (ICAR/ AICRP/SAU/ other, please specify)	Random sampling and Group meetings.

Table 1: Effect of different chemotherapeutics against Argulosis disease.

Thematic area	Technology options with detailed treatment	Area (ha in crop & Fodder)/ Nos (in livestock)		Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs/ha)	Net return (Rs./ha)	BC ratio
		Proposed	Actual					
Fish Production & Disease Management	PF: Use of insecticide (Cypermethrine) @ 50 ml /acre/meter depth	0.4 ha	0.4 ha	2890.00	230000	43350	203500	1.88
	To1: Use of lactoclean @ 40gm/acre/meter depth	0.4 ha	0.4 ha	3270.00	238000	490500	252500	2.06
	To2: Use of CIFRI-ARGCURE @ 40ml/acre/meter depth	0.4 ha	0.4 ha	4156.00	251000	623400	372400	2.48







23. Krishi Vigyan Kendra Muzaffarpur II

Thematic area: Introduction of candidate freshwater fish species in aquaculture system of Bihar

Problem definition/Name of OFT: Low profitability from conventional carp culture/performance evaluation of *Ompok sp.*

1.	Title of On farm Trial	Performance evaluation of Ompok sp. (Pabda) in seasonal ponds
2.	Problem diagnosed	Low profitability from conventional carp culture
3.	Details of technologies selected for assessment	FP: Polyculture of IMC fishes @4000/acre of average body weight 5g. T_{O1}: Monoculture of Pabda @15,000/acre of average body weight 5g. TO_2:Monoculture of Pabda @25,000/acre of average body weight 5g.
4.	Source of Technology(ICAR/ AICRP/SAU/other, please specify)	ICAR-CIFA, Bhubnesawar
5.	Production system and thematic area	Introduction of candidate freshwater fish species in aquaculture system of Bihar
6.	Performance of the Technology with performance indicators	Technology observations- • Length of fish • Specific growth rate • Production/yield (in ha), survivability percentage & BC ratio
7.	Final recommendation for micro level situation	Due to higher economic return Pabda is more preferred among farmers.
8.	Constraints identified and feedback for research	Cannibalism during younger stage
9.	Process of farmers participation and their reaction	Through training, field days

Results

Themetic area	Technology options with detailed treatment	Area (ha)		Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs./ha)	Net return (Rs./ha)	B:C ratio
		Proposed	Actual					
Introduction of candidate freshwater fish species in aquaculture system of Bihar	FP: Polyculture of IMC fishes @4000/acre of average body weight 5g.	7	7.2	33.2	245500	550200	304700	2.2
	T_{O1}:Monoculture of Pabda @ 15,000/acre of average body weight 5g			20.3	283500	760000	476500	2.7
	T_{O2} : Monoculture of Pabda @25,000/acre of average body weight 5g			29.1	2,21,640	7,77,985	5,56,345	2.9

24. Krishi Vigyan Kendra Dhanbad

Thematic area: Value addition & Income generation

Problem definition/Name of OFT: (a) Low market price of jackfruit during peak season and lack of nutritional value of seasonal fruits like jackfruit.

1	Title of On farm Trial	**Assessment of preparation methods of Ripe Jack fruit Papad(Bar)**
2	Problem diagnosed	(a) Low market price of Jackfruit during peak season. (b) Lack of Nutritional value of Seasonal Fruits like Jackfruit.
3	Details of technologies selected for assessment/refinement	Farmers /Farmwomen Practice-Local people consume ripe Jack fruit as such as ripe. TO1 - Preparation of Papad (Bar) from ripe Jackfruit Formulation- Ingredients Jackfruit Pulp- 5.0 kg, Sugar -500gm, Citric Acid-25gm, Sodium Benzoate- 5.gm TO2 – Preparation of Papad (Bar) from ripe Jackfruit Blended with Mango Formulation- Ingredients Jackfruit Pulp- 2.5 kg, Mango- 2.5 kg Sugar -500gm, Citric Acid-25.0g, Sodium Benzoate- 5.gm
4	Source of Technology	DRPCAU, Pusa Samastipur
5	Production system and thematic area	Value addition & Income generation
6	Performance of the Technology with performance indicators	(a) Life & Product Recovery (b) Organoleptic Test (c) Cost/Benefit Ratio
7	Final recommendation for micro level situation	It is recommended that preparation techniques of jackfruit Papad its labeling and packaging among the SHGs /FPOshould promoted to get FSSAI number. It is also recommended that the techniques of value addition can be initiated as entrepreneurship development among the rural youth and SHGs/FPO from local & underutilized fruits for nutrition security.
8	Constraints identified and feedback for research	Lack of Proper Market facility and unaware of rich source of nutrients present in Jackfruits.
9	Process of farmers participation and their reaction	Farmwomen are happy to adopt these easy techniques for income generation by locally and seasonally available jackfruits in making Jackfruit papad with labeling and packaging & also in farm family as well for household consumption.

Nutrition value Of Jackfruit(per 100gms)

Nutrients	Protein(gm)	Minerals(gm)	Carbohydrates(gm)	Energy(Kcal)	Calcium(mg)	Phosphorus(mg)	Iron(mg)
Jackfruit	1.9	0.9	19.8	88	20	41	0.56

Technology assessed:

Technology option	No. of trials	Shelf-LifeOrganoleptic Test at 5 point Scale, Taste Flavor ColourTexture General Acceptability			Production /unit	Cost of cultivation (Rs./Kg)	Gross return (Rs/kg)	Net return (Rs./kg)	BC ratio
		After 2 months	After 4 months	After 6 months					
Farmers /Farmwomen Practice – Local people consume ripe Jack fruit as such as ripe.	5	Fair	Fair	Fair	5Kg	200.00	360.00	120.00	1.8:1
TO1 - Preparation of Papad (Bar) from ripe Jackfruit Formulation- Ingredients Jackfruit Pulp- 5.0 kg, Sugar -500gm, Citric Acid-25gm, Sodium Benzoate- 5.gm	5	Fair	Fair	Fair	5Kg	250.00	875.00	475.00	7:2

Technology option	No. of trials	Shelf-LifeOrganoleptic Test at 5 point Scale, Taste Flavor ColourTexture General Acceptability			Production /unit	Cost of cultivation (Rs./Kg)	Gross return (Rs/kg)	Net return (Rs./kg)	BC ratio
		After 2 months	After 4 months	After 6 months					
TO_2 – Preparation of Papad (Bar) from ripe Jackfruit Blended with Mango Formulation-Ingredients Jackfruit Pulp- 2.5 kg, Mango-2.5 kg Sugar -500gm, Citric Acid-25.0g, Sodium Benzoate- 5.gm	5	Good	Good	Fair	5Kg	125.00	375.0	250.0	:2

25. Krishi Vigyan Kendra Saran

Thematic Area: Value Addition

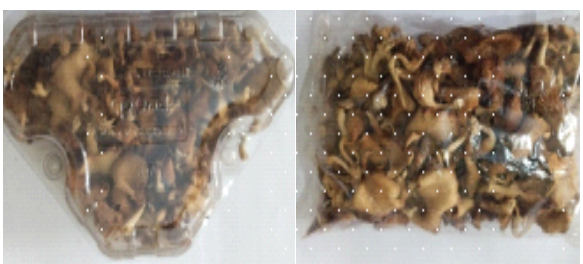
Assessment of different packaging materials on the shelf life of oyster mushroom

Problem definition/Name of OFT:

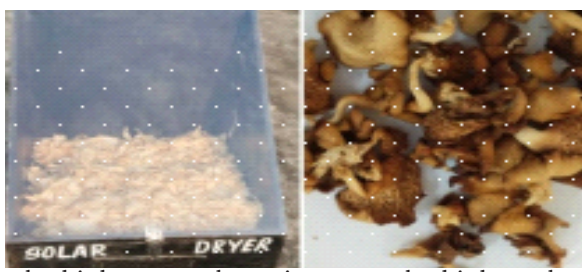
1.	Title of On farm Trial (OFT)	Assessment of different packaging materials on the shelf life of oyster mushroom
2.	Problem diagnosed	Mushroom is now becoming popular vegetable in India and it is very perishable due to their high aspiration rate.
3.	Details of technologies selected forassessment / refinement(Mention either Assessed or Refined)	FP: No packaging TO_1: Suitable punnet (wash in plain water, pre-treatment with 0.05 % KMS TO_2: Biodegradable LDPE bag (40-60 micron/100-150 gauge) wash in plain water, pre-treatment with 0.05 % KMS)
4.	Source of Technology (ICAR/ AICRP/SAU/ other, please specify)	G. B. Pant University of Agriculture and Technology, P antnagar, UK
5.	Production system and thematic area	Value addition
6.	Performance of the Technology with performance indicators	• Colour • Rehydration ratio • Sensory evaluation
9.	Process of farmers participation and their reaction	• Field visit • Farmers' Interaction and feedback

Results

Technology option	Rehydration Ratio				Colour				Overall acceptability			
	0 days	30 days	60 days	90 days	0 days	30 days	60 days	90 days	0 days	30 days	60 days	90 days
FP: No packaging and dried under sunlight	2.82	2.71	2.55	2.23	6.8	6.3	6.4	6.2	7.1	6.9	6.7	6.5
To1: (Suitable punnet (wash in plain water, pre-treatment with 0.05 % KMS and solar dried)	3.85	3.77	3.51	3.28	8.2	8.1	8.1	7.9	8.4	8.2	8.2	8.1
To2: (LDPE bag (40-60 micron/100-150 gauge) wash in plain water, pre-treatment with 0.05 % KMS) and solar dried)	3.88	3.71	3.48	3.11	8.3	8.2	8.1	8.0	8.5	8.3	8.2	8.1
SEM	0.03	0.02	0.02	0.02	0.05	0.03	0.04	0.05	0.03	0.03	0.02	0.02
CD (0.05)	NS				0.12				0.09			



Solar dried mushroom



Solar dried oyster mushroom in punnet Solar dried LDPE bag

26. Krishi Vigyan Kendra Vaishali

Thematic area- Value addition

Problem definition/Name of OFT: Mushroom is a highly perishable food item with low shelf life. Thus, people consume it mostly as fresh vegetable. Therefore, biscuit prepared from mushroom is way to increase it shelf life with high nutrient content

1.	Title of On farm Trial	Assessment of preparation methods of Mushroom Biscuit for more shelf life, enhancement of nutrition & income
2.	Problem diagnosed	Mushroom is a highly perishable food item with low shelf life. Thus, people consume it mostly as fresh vegetable. Therefore, biscuit prepared from mushroom is way to increase it shelf life with high nutrient content.
3.	Details of technologies selected for assessment /refinement	Farmer's Practice- Local people consume fresh mushroom as such as vegetables. Technology Option-01 Preparation of mushroom biscuit (90% Maida, 10% Mushroom powder) Technology Option-02 -Preparation of mushroom biscuit with ragi (70% Maida, 10% Mushroom powder & 20% Ragi)
4.	Source of Technology (ICAR/ AICRP/SAU/ other, please specify)	ICAR-Directorate of Mushroom Research Chambaghat, Solan
5.	Production system and thematic area	Value addition
6.	Performance of the Technology with performance indicators	1. Sensory evaluation (5 point hedonic scale) 2. Shelf life
7.	Final recommendation for micro level situation	The treatment TO2 mushroom biscuit with ragi (70% Maida, 10% Mushroom powder & 20% Ragi) recorded higher score for color and appearance, flavor, crispiness, Taste and overall acceptability up to 60 days of storage. Therefore, it is recommended for farmers.
8.	Constraints identified and feedback for research	No constraints
9.	Process of farmers participation and their reaction	Field visit, Interaction with farm women, Training and Demonstrations

Thematic area	Technology options with detailed treatments	Nos		Color & appearance			Flavour			Crispiness			Taste			Overall acceptability		
		Proposed	Actual	Initial	30 days	60 days	Initial	30 days	60 days	Initial	30 days	60 days	Initial	30 days	60 days	Initial	30 days	60 days
Value addition	FP- Local people consume fresh mushroom as such as vegetables.	7	7	3.84	3.42	3.01	3.92	3.62	3.15	3.80	3.25	2.96	3.96	3.68	3.15	3.88	3.49	3.06
	Technology Option -01 Preparation of mushroom biscuit (90% Maida, 10% Mushroom powder	7	7	4.20	3.80	3.24	4.41	4.00	3.50	4.27	3.85	3.14	4.35	3.75	3.25	4.30	3.85	3.28
	Technology Option -02 -Preparation of mushroom biscuit with ragi (70% Maida, 10% Mushroom powder & 20% Ragi	7	7	4.50	4.24	3.94	4.60	4.15	3.75	4.55	4.00	3.78	4.56	4.01	3.64	4.55	4.12	3.77

OFT on Mushroom Biscuit for more shelf life, enhancement of nutrition &income

27. Krishi Vigyan Kendra Muzaffarpur I

Thematic area: Value addition

Problem definition/Name of OFT: Development of plant based low-cost herbal gulal

1	Title	Development of plant based low-cost herbal Gulal
2	Problem diagnose	Scientific tests have verified that synthetic dye-based 'holi' powder can cause skin abrasions, eye irritation, allergy and can even trigger asthma.
3	Details of Technologies selected for assessment/ refinement	Farmer's Practice (FP): Use synthetic colour and arrowroot powder as ingredients in holi powder Technology option I (TO_1) Use of kitchen products and its residue:- Arrowroot Powder (1 kg) + Beetroot Juice(750 ml)/Raw turmeric paste (300 gm)/Marigold flower paste (750 gm /Flat bean leaves (1 kg) Technology option II (TO_2): Aqueous solution of food color + Arrowroot Powder of 10% concentrations for three different colour were prepared.
4	Source of technology	DRPCAU, Pusa, Samastipur&AAU, Jorhat, Assam
5	Replication	07
6	Production System & Thematic area	Value addition
7	Critical input	Arrowroot Powder, Beetroot Juice, Raw turmeric paste, Marigold flower paste, Flat bean leaves, synthetic colour and food colour
8	Performance of Technology with performance indicator	Shelf life after 3, 6, 9 and 12 months, Packaging material, B:C Ratio
9	Process of farmers participation and their reaction	One-to-one interaction with farmers and Demonstration
10	Final recommendation	A plant based low-cost herbal Gulal- done with 7 farmers. In which on the basis of evidence it was seen that Technology- I was more accepted by the people. Its initial assessment was 4.7 and BC ratio was 2.0, followed by Technology-II. It is moderately accepted by the people. Its ratio is 1.25. Also Technology-I&II did not show any change in the color quality mentioned above during storage at room temperature in the dark in sealed plastic packets between immediately after manufacture and one year after manufacture. The BC ratio of Gulal made in the practice of farmers is the lowest with a value of 1.14.and when stored in sealed plastic packets at room temperature in the dark, it was observed that the color quality showed changes immediately after manufacturing and within three months of manufacturing.

Table 1: Development of plant based low cost herbal gulal

Thematic area	Technology options with detailed treatment	Nos		Yield (q/ha)	Cost of cultivation (Rs./kg)	Gross return (Rs./kg)	Net return (Rs./kg)	BC ratio
		Proposed	Actual					
Value addition	FP: Use of DORB + MOC (1:1)	10	10	0.30	Rs.350 /kg gulal	400	50	1.14
	T_{O1}: Use of formulated feed additive Nanoplus @CIFA	10	10	0.50	Rs.200 /kg herbal gulal	400	200	2.00
	T_{O2}: Use of commercially available fish feed additive	10	10	0.42	Rs.320 /kg foodcolour based herbal gulal	400	80	1.25

28. Krishi Vigyan Kendra SamastipurII
Drudgery Reduction Technology
Problem definition/Name of OFT: Problems faced by farm workers while performing harvesting of Soybean

1	Title of On farm Trial	**Assessment of the effectiveness of Mittens for soybean harvesting**
2	Problem diagnosed	Problems faced by farm workers while performing harvesting of Soybean
3	Details of technologies selected for assessment/refinement (Mention either Assessed or Refined)	**FP:**Soybean harvesting is performed manually with the help of sickle. TO_1: Using locally available gloves for cutting, collecting and bundling plants manually. TO_2: Using protective mittens developed by AICRP FRM, College of Home Science, VNMKV Parbhanifor soybean harvesting.
4	Source of Technology (ICAR/ AICRP/SAU/other, please specify)	AICRP Family Resource Management, College of Home Science, VNMKV Parbhani
5	Production system and thematic area	Drudgery Reduction
6	Performance of the Technology with performance indicators	➢ Soybean harvesting efficiency ➢ Musculo-skeletal problem ➢ Overall discomfort rate ➢ Drudgery Score
7	Final recommendation for micro level situation	An On-farm trial for Assessment of the effectiveness of Mittens for soybean harvesting was conducted in 10 different locations in Samastipur district of Bihar. The Result showed that TO_1(Using locally available gloves for cutting, collecting and bundling plants manually) reduced the discomfort by 59.16 percent whereas TO_2(Using protective mittens developed by AICRP FRM, College of Home Science, VNMKV Parbhanifor soybean harvesting) reduced the discomfort by 70.37 percent. Overall Discomfort also reduced with the use TO_1 (83.06%) and further reduced with the use of TO_2 (88.26%). Farmers faced various types of musculoskeletal problems like Pain, Numbness, tingling sensation, Weakness & Redness while performing the activity without any technological assistance. TO_1 were helpful in reducing the discomfort. But TO_2 were highly effective in reducing their musculoskeletal problems. Technologies also helped in increasing the efficiency of soybean harvesting. It was observed that there was remarkable increase in the soybean harvesting efficiency by using TO_2 (20.97%) followed by locally available TO_1 (15.01%). Soybean Harvesting is a Drudgery prone Activity when performed without any technological intervention. Technologies like TO_1 and TO_2 were provided to the farmers for reducing their discomfort. Among both the technologies, TO2were better in every aspect as it was helpful in reducing the drudgery, overall discomfort and musculoskeletal problem of the farmers. It also increased the efficiency of soybean harvesting.
8	Constraints identified and feedback for research	Lack of knowledge among farmers about technology.
9	Process of farmers participation and their reaction	Training, Demonstrationand visit to farmers' field

Table: 1 Work output of Soybean harvesting with traditional and improved method (n=10)

Name of Activity	Parameters for Observation	Farmer Practice	TO_1	TO_2	Percentage change between Farmer Practice &TO_2	Percentage change between TO_1&TO_2
Cutting soybean plants with Sickle	Work done/ unit time (sq.mt./30 min.)	146.95±8.96	154.25±2.34	177.4±8.09	20.97	15.01
Collecting and Bundling of soybean plants	Work done/ unit time (Kg/30 min.)	62.2±6.25	72.7±8.16	100.3±13.03	72.03	31.87
	Drudgery Score	4.3±3.02	3.1±0.67	1.2±0.73	70.37	59.16
Overall Discomfort rate	VAD Scale*	8.5±1.08	6.1±1.31	1.0±0.81	88.26	83.06

**VAD- Visual Analogue Discomfort Scale, 0- No Discomfort, 10- Extreme Discomfort*

Table: 2 Musculoskeletal problems of hand in Soybean harvesting

Body parts	Upper arm			Lower arm			Wrist			Palm			Fingers		
Type of MSD	FP	TO1	TO2	FP	TO 1	TO 2	FP	TO 1	TO 2	FP	TO1	TO 2	FP	TO 1	TO 2
Pain*	3.77±0.97	3.1±0.73	1.2±0.42	4.0±0	3.6±0.51	1.3±0.48	4.44±0.52	3.1±0.73	1.1±0.31	4.66±0.5	2.9±0.73	1.1±0.31	4.44±0.52	3.7±0.67	1.4±0.51
Numbness*	1.0±0	1.4±0.69	1.3±0.48	3.44±0.52	1.5±0.52	1.2±0.42	2.77±0.66	2.6±0.51	1.1±0.31	3.88±0.60	2±0.66	1.3±0.48	3.66±0.70	3.2±0.91	1.1±0.31
Stiffness*	1.55±0.72	2.3±0.82	1.1±0.31	3.66±0.5	2.4±0.69	1.2±0.42	3.22±0.66	1.9±0.73	1.1±0.31	3.44±0.52	2.6±0.84	1±0	4.11±0.78	3.6±0.84	1.1±0.31
Tingling* Sensation	2.22±0.97	2.6±0.69	1.2±0.42	3.0±1.22	2.5±1.08	1.1±0.31	2.55±0.52	2.2±0.78	1.1±0.31	3.11±0.78	2.9±0.56	1±0	4.22±0.66	2.8±0.78	1±0
Weakness*	3.0±0.70	3.8±0.78	1.2±0.42	3.33±0.70	2.5±0.84	1.3±0.48	3.66±0.5	1.8±0.63	1.4±0.51	2.88±1.05	2.9±0.56	1.2±0.42	4.22±0.66	3.1±0.99	1±0
Redness*	1.22±0.44	2.2±0.91	1.2±0.42	4.11±0.78	2.8±0.78	1.5±0.52	2.77±0.44	1.8±0.78	1.2±0.42	4.33±0.70	2.8±0.78	1.2±0.42	4.77±3.89	3±0	1±0

FRONT LINE DEMONSTRATIONS (FLDs)

Front Line demonstrations (FLDs) is a unique approach to provide a direct interface between researcher and farmers as the scientists are directly involved in planning, execution and monitoring of the demonstrations for the technologies developed by them and get direct feedback from the farmers' field. This enables the scientists to improvise upon the research programme accordingly. FLDs provide an opportunity to researchers and extension personnel for understanding the farmer's resources and requirement to fine tune and/or modify the technologies for easy adaptability at farmers' fields. Its main goals are to evaluate production limitations, pinpoint elements that lead to increased output, and produce insightful production and feedback data. FLDs are carried out in a variety of sectors, including home science, animal science, horticulture, and agricultural production, and are not exclusive to any one industry. FLDs function as a type of applied research in which a limited number of farmers' fields are used to test the most recent varieties, together with certain parts or complete packages of methods. In 2023, KVKs engaged in Front Line Demonstrations covering 3743.74 ha, affecting 14771 farmers in this particular zone (Table).

Table: State wise details of Front-Line Demonstration on field crops

State	Oil Seed		Pulse		Cereals		Vegetable		Fruit		Other crops*		Total	
	No.of farmer	Area (ha)	No. of farmer	Area (ha)	No. of farmer	Area (ha)	No. of farmer	Area (ha)	No. of farmer	Area (ha)	No.of farmer	Area (ha)	No. of farmer	Area (ha)
Bihar	348.00	124.40	1431.00	332.35	3354.00	1169.42	2864.00	294.04	374.00	43.20	589.00	342.85	8960.00	2306.26
Jharkhand	1075.00	397.20	608.00	178.60	1949.00	629.00	1511.00	143.17	87.00	8.80	581.00	80.71	5811.00	1437.48
Total	1423.00	521.60	2039.00	510.95	5303.00	1798.42	4375.00	437.21	461.00	52.00	1170.00	423.56	14771.00	3743.74

Fodder, Flower, Spices, Fibre Crop

Oilseed Crop

In recent years, the government has prioritized the cultivation of oilseed crops as part of its national food security mission. Due to the increasing demand for oilseeds, the country had to rely on imports, putting a strain on the country's finances. To address the economic crisis, the KVKs in Zone-IV implemented programs aimed at boosting the production and productivity of oilseed crops. These programs involved strategic planning and the execution of frontline demonstration programs across Bihar and Jharkhand. Under the FLD program, significant attention was given to important oilseed crops, like mustard, groundnut, niger, linseed, sesame, and soybean. These crops covered a total area of 521.60 hectares, involving the participation of 1423 farmers. Mustard cultivation received particular focus, encompassing 377 hectares and engaging 1019 farmers. On the other hand, groundnut cultivation showed the highest percentage increase in yield (27.89 %) (Table).

Table: Details of Frontline Demonstration on Oilseeds

S. No.	Crop	State	No. of Farmers	Area (ha)	Yield (q/ha)		Increase (%)	Economics of Demonstration (Rs/ha)				Economics of Check (Rs/ha)			
					Demo	Check		Gross Cost	Gross Return	Net Return	BCR	gross Cost	gross Return	Net Return	BCR
1	Mustard	Bihar	304.00	107.00	10.91	8.70	19.63	19394.29	48780.43	29387.00	1.81	18653.57	39203.00	20549.43	1.53
		Jharkhand	715.00	270.00	10.35	7.60	22.90	23982.29	53020.57	29038.29	1.39	20685.71	38864.14	18178.43	1.18
		Total	1019.00	377.00	10.63	8.15	21.27	21688.29	50900.50	29212.65	1.60	19669.64	39033.57	19363.93	1.36
2	Sesame	Bihar	32.00	13.40	6.95	5.10	33.88	24900.00	64125.00	39225.00	2.52	22840.00	46137.50	23297.50	2.07
		Jharkhand	32.00	10.00	3.92	3.23	21.36	16000.00	33810.00	17810.00	2.11	14800.00	27891.00	13091.00	1.88
		Total	64.00	23.40	5.44	4.17	27.62	20450.00	48967.50	28517.50	2.32	18820.00	37014.25	18194.25	1.98
3	Ground Nut	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Jharkhand	16.00	5.20	11.34	9.68	27.89	34475.00	65276.50	30801.50	1.79	32875.00	57005.00	24130.00	1.59
		Total	16.00	5.20	11.34	9.68	27.89	34475.00	65276.50	30801.50	1.79	32875.00	57005.00	24130.00	1.59
4	Linseed	Bihar	12.00	4.00	8.98	8.20	9.51	27800.00	67350.00	39550.00	2.42	26300.00	51500.00	35200.00	1.96
		Jharkhand	60.00	22.00	6.32	4.60	18.70	8800.00	24016.00	15216.00	1.36	7300.00	14752.00	7452.00	1.01
		Total	72.00	26.00	7.65	6.40	14.11	18300.00	45683.00	27383.00	1.89	16800.00	33126.00	21326.00	1.49
5	Niger	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Jharkhand	217.00	80.00	4.12	3.17	26.97	13973.50	30038.13	16064.63	1.90	12060.13	23002.13	10942.00	1.68
		Total	217.00	80.00	4.12	3.17	26.97	13973.50	30038.13	16064.63	1.90	12060.13	23002.13	10942.00	1.68
6	Sunflower	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Jharkhand	35.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Total	35.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grand Total			1423.00	521.60	7.84	6.31	23.57	21777.36	48173.13	26395.86	1.90	20044.95	37836.19	18791.24	1.62

Pulse Crop

Front Line demonstrations were conducted for various pulses crop including chickpea, pigeon pea, lentil, green gram, black gram, field pea, horse gram, and rice bean. These demonstrations covered a total area of 510.95 hectares, involving 2039 farmers. In Bihar, the area covered was 332.35 hectares with the participation of 1431 farmers, while in Jharkhand, it was 178.6 hectares with 608 farmers. Among the pulses, lentil occupied the top position in terms of farmer involvement (572 Farmers) and area covered (157.25). This was followed by chickpea pea, with a total of 453 farmers (Table) and the second maximum area covered in green gram (122.40) under front line demonstration.

Table: Details of Front-Line Demonstration on Pulses Crop

Crop	state	No. of Farmers	Area (ha)	Yield (q/ha)		Increase (%)	Economics of Demonstration (Rs/ha)				Economics of Check (Rs/ha)			
				Demo	Check		Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
Black Gram	Bihar	25.00	10.00	11.31	9.54	18.55	21900.00	67386.00	45486.00	3.08	18800.00	52272.00	33432.00	2.78
	Jharkhand	129.00	40.40	5.21	4.82	5.50	19716.67	36232.67	16516.00	1.23	20733.33	33475.67	13642.33	1.10
	Total	154.00	50.40	8.26	7.18	12.03	20808.34	51809.34	31001.00	2.16	19766.67	42873.84	23537.17	1.94
Chick Pea	Bihar	352.00	43.40	13.22	9.34	12.16	18794.67	67628.00	48832.50	2.27	18500.00	51465.33	32965.33	1.37
	Jharkhand	101.00	17.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	453.00	60.40	13.22	9.34	12.16	18794.67	67628.00	48832.50	2.27	18500.00	51465.33	32965.33	1.37
Cow Pea	Bihar	10.00	3.80	91.06	79.80	14.11	43600.00	109272.00	65672.00	2.51	41420.00	95760.00	54340.00	2.31
	Jharkhand	14.00	8.00	12.40	8.04	54.23	114579.00	198628.00	84048.00	1.73	85900.00	129904.00	44004.00	1.51
	Total	24.00	11.80	51.73	43.92	34.17	79089.50	153950.00	74860.00	2.12	63660.00	112832.00	49172.00	1.91
Field Pea	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	20.00	5.00	23.40	17.22	35.89	22300.00	78615.00	56315.00	3.53	21075.00	59623.00	38548.00	2.83
	Total	20.00	5.00	23.40	17.22	35.89	22300.00	78615.00	56315.00	3.53	21075.00	59623.00	38548.00	2.83
Green gram	Bihar	334.00	122.40	9.28	7.71	20.46	22105.80	63705.80	41600.00	2.88	22291.00	45714.00	23423.00	2.06
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	334.00	122.40	9.28	7.71	20.46	22105.80	63705.80	41600.00	2.88	22291.00	45714.00	23423.00	2.06
Horse Gram	Bihar	24.00	4.50	6.20	4.32	43.52	32200.00	93000.00	60800.00	2.89	30100.00	64800.00	34700.00	2.15
	Jharkhand	55.00	25.00	6.00	4.65	31.89	15249.00	25800.00	10551.00	1.78	14249.00	24280.00	10031.00	1.73
	Total	79.00	29.50	6.10	4.49	37.71	23724.50	59400.00	35675.50	2.34	22174.50	44540.00	22365.50	1.94
Lentil	Bihar	439.00	117.25	9.73	8.22	12.52	13920.25	48404.50	34484.25	2.12	13668.25	41192.33	27457.42	1.82
	Jharkhand	133.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	572.00	157.25	9.73	8.22	12.52	13920.25	48404.50	34484.25	2.12	13668.25	41192.33	27457.42	1.82
Pigeon Pea	Bihar	247.00	31.00	4.40	3.56	5.92	6608.50	30782.50	24174.00	1.16	6450.00	24885.00	18435.00	0.96
	Jharkhand	156.00	43.20	2.88	3.41	-3.94	8890.00	13917.50	6285.00	0.39	8125.00	17847.25	9722.25	0.55
	Total	403.00	74.20	3.64	3.49	0.99	7749.25	22350.00	15229.50	0.78	7287.50	21366.13	14078.63	0.76
Grand Total		2039.00	510.95	15.67	12.70	20.74	26061.54	68232.83	42249.72	2.27	23552.86	52450.83	28943.38	1.83

Cereal Crop

The KVKs of Bihar and Jharkhand conducted front line demonstrations on cereal crops during 2023. These demonstrations covered a total area of 1798.42 hectares and involved 5303 farmers. In the case of paddy, the demonstrations conducted by the KVKs of Bihar and Jharkhand covered an area of 816.75 hectares, with the participation of 1859 farmers. These demonstrations resulted in increase of 14.55 % and 26.09 % yield compared to the local check in Bihar and Jharkhand respectively. For wheat, the demonstrations covered 412.04 hectares and involved 1419 farmers from Bihar and Jharkhand. Maize demonstrations were conducted in 453

farmers' fields, covering an area of 143.23 hectares by the KVKs of Bihar and Jharkhand. Among the cereals, paddy occupied the highest area coverage in Bihar and Jharkhand in terms of farmer involvement (1859 farmers) and area covered (816.75 ha) (Table).

Table: Details of Front-Line Demonstration on Cereals Crop

Crop	state	No. of Farmers	Area (ha)	Yield (q/ha)		Increase (%)	Economics of Demonstration (Rs/ha)				Economics of Check (Rs/ha)			
				Demo	Check		Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
Paddy	Bihar	921.00	518.05	44.93	39.36	14.55	34630.79	91616.97	56725.43	2.52	35080.32	79824.49	59122.11	2.22
	Jharkhand	938.00	298.70	39.39	32.33	26.09	40596.90	77255.63	37613.89	1.96	39498.74	63115.56	24902.92	1.63
	Total	1859.00	816.75	42.16	35.85	20.32	37613.85	84436.30	47169.66	2.24	37289.53	71470.03	42012.52	1.93
Wheat	Bihar	1224.00	353.14	23.41	21.42	6.43	18231.96	49646.79	31480.05	1.48	17862.07	42687.14	25107.78	1.25
	Jharkhand	195.00	58.90	14.86	15.98	1.03	14089.59	27907.18	13103.29	0.71	13970.43	25470.68	11500.25	0.65
	Total	1419.00	412.04	19.14	18.70	3.73	16160.78	38776.99	22291.67	1.10	15916.25	34078.91	18304.02	0.95
Maize	Bihar	322.00	93.83	37.20	33.55	7.59	83769.20	73342.50	46526.10	1.63	27622.70	66108.70	38486.00	1.55
	Jharkhand	131.00	49.40	43.37	34.06	33.68	32197.50	66607.83	38477.00	2.07	30145.83	56280.83	27576.67	1.83
	Total	453.00	143.23	40.29	33.81	20.64	57983.35	69975.17	42501.55	1.85	28884.27	61194.77	33031.34	1.69
Finger Millets	Bihar	350.00	84.95	15.16	11.29	24.59	21699.41	49713.94	28015.12	2.01	17734.12	34562.35	16945.88	1.48
	Jharkhand	601.00	199.00	17.71	12.01	39.60	25766.31	61740.31	37512.46	2.45	22239.23	39794.77	21255.54	1.78
	Total	951.00	283.95	16.44	11.65	32.10	23732.86	55727.13	32763.79	2.23	19986.68	37178.56	19100.71	1.63
Bajra	Bihar	77.00	12.40	21.51	15.76	11.66	25265.75	56590	31323.25	2.23	20642.50	41943.75	21301.25	1.52
	Jharkhand	35.00	5.00	24.00	18.00	33.33	34500	156000	121500.00	4.52	32600.00	117000.00	84400.00	3.59
	Total	112.00	17.40	22.76	16.88	22.50	29882.88	106295	76411.63	3.38	26621.25	79471.88	52850.63	2.56
Barley	Bihar	22.00	8.50	26.68	14.61	10.68	24572.05	44555.88	19508.83	1.35	17714.45	22860.61	5146.16	0.64
	Jharkhand	25.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	47.00	18.50	26.68	14.61	10.68	24572.05	44555.88	19508.83	1.35	17714.45	22860.61	5146.16	0.64
Barnyard millets	Bihar	32.00	3.30	10.26	7.88	19.94	16925.00	32810.00	15885.00	1.94	12362.50	20485.00	8122.50	1.24
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	32.00	3.30	10.26	7.88	19.94	16925.00	32810.00	15885.00	1.94	12362.50	20485.00	8122.50	1.24
Foxtail Millets	Bihar	77.00	8.30	13.51	12.37	15.12	13794.18	27094.55	13300.38	1.46	9450.00	17562.50	8112.50	0.93
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	77.00	8.30	13.51	12.37	15.12	13794.18	27094.55	13300.38	1.46	9450.00	17562.50	8112.50	0.93
Kodo Millets	Bihar	36.00	4.70	12.25	6.50	20.75	16485.72	28792.25	12306.53	1.84	6062.50	11490.00	5427.50	0.96
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	36.00	4.70	12.25	6.50	20.75	16485.72	28792.25	12306.53	1.84	6062.50	11490.00	5427.50	0.96
Kutki	Bihar	7.00	3.50	9.65		0.00	17316.70	27020.00	9703.30	1.56	0.00	0.00	0.00	0.00
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	7.00	3.50	9.65		0.00	17316.70	27020.00	9703.30	1.56	0.00	0.00	0.00	0.00

Crop	state	No. of Farmers	Area (ha)	Yield (q/ha)		Increase (%)	Economics of Demonstration (Rs/ha)				Economics of Check (Rs/ha)			
				Demo	Check		Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
Pearl Millets	Bihar	162.00	58.00	27.08	24.37	20.50	29338.03	79443.48	50105.47	3.00	24883.33	57952.50	33069.17	2.14
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	162.00	58.00	27.08	24.37	20.50	29338.03	79443.48	50105.47	3.00	24883.33	57952.50	33069.17	2.14
Proso Millet	Bihar	15.00	5.00	13.80	10.56	33.10	16150.00	49516.00	33366.00	3.07	15450.00	37643.50	23193.50	2.41
	Jharkhand	14.00	5.00	7.88	6.06	30.03	13085.00	35460.00	22375.00	2.71	11050.00	27270.00	16220.00	2.47
	Total	29.00	10.00	10.84	8.31	31.57	14617.50	42488.00	27870.50	2.89	13250.00	32456.75	19706.75	2.44
Pseudo Millet	Bihar	10.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	10.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
sorghum	Bihar	99.00	11.75	21.51	18.92	15.91	23664.17	58097.70	34433.53	2.45	20228.00	42211.80	21983.80	1.68
	Jharkhand	10.00	3.00	32.40	27.20	19.12	32800.00	96228.00	66428.00	2.93	27900.00	80784.00	29360.00	2.90
	Total	109.00	14.75	26.96	23.06	17.52	28232.09	77162.85	50430.77	2.69	24064.00	61497.90	25671.90	2.29
Grand Total		5303.00	1798.42	19.86	16.46	16.81	23332.50	51041.26	30017.79	1.97	16891.77	36264.24	19325.41	1.39

Millet Crop

Millets are a group of nutritiously rich, drought tolerant and mostly grown in the arid and semi-arid regions of India. They are small-seeded grasses belonging to the botanical family poaceae. They constitute an important source of food and fodder for millions of resource-poor farmers and play a vital role in ecological and economic security of India. These millets are also known as "coarse cereals" or "cereals of the poor". Millets are nutritionally superior to wheat and rice as they are rich in protein, vitamins and minerals. They are also gluten-free and have a low glycaemic index, making them ideal for people with celiac disease or diabetes.

Under promotion of International year of millet, the KVKs of Bihar and Jharkhand conducted front line demonstrations on millet crops during 2023(Table). These demonstrations covered a total area of 426.4 hectares and involved 1572 farmers. Among the millets, finger millet occupied the first rank in Bihar and Jharkhand in terms of farmer involvement (951 Farmers) and area covered (283.95 ha).

Table: Details of Front-Line Demonstration on Millet Crop

Crop	state	No. of Farmers	Area (ha)	Yield (q/ha)		Increase (%)	Economics of Demonstration (Rs/ha)				Economics of Check (Rs/ha)			
				Demo	Check		Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
Finger Millets	Bihar	350.00	84.95	15.16	11.29	24.59	21699.41	49713.94	28015.12	2.01	17734.12	34562.35	16945.88	1.48
	Jharkhand	601.00	199.00	17.71	12.01	39.60	25766.31	61740.31	37512.46	2.45	22239.23	39794.77	21255.54	1.78
	Total	951.00	283.95	16.44	11.65	32.10	23732.86	55727.13	32763.79	2.23	19986.68	37178.56	19100.71	1.63
Bajra	Bihar	77.00	12.40	21.51	15.76	11.66	25265.75	56590.00	31323.25	2.23	20642.50	41943.75	21301.25	1.52
	Jharkhand	35.00	5.00	24.00	18.00	33.33	34500	156000	121500	4.52	32600	117000	84400	3.59
	Total	112.00	17.40	22.76	16.88	22.50	29882.88	106295.	76411.63	3.38	26621.25	79471.88	52850.63	2.56
Barley	Bihar	22.00	8.50	26.68	14.61	10.68	24572.05	44555.88	19508.83	1.35	17714.45	22860.61	5146.16	0.64
	Jharkhand	25.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	47.00	18.50	26.68	14.61	10.68	24572.05	44555.88	19508.83	1.35	17714.45	22860.61	5146.16	0.64
Barnyard millets	Bihar	32.00	3.30	10.26	7.88	19.94	16925.00	32810.00	15885.00	1.94	12362.50	20485.00	8122.50	1.24
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	32.00	3.30	10.26	7.88	19.94	16925.00	32810.00	15885.00	1.94	12362.50	20485.00	8122.50	1.24
Foxtail Millets	Bihar	77.00	8.30	13.51	12.37	15.12	13794.18	27094.55	13300.38	1.46	9450.00	17562.50	8112.50	0.93
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	77.00	8.30	13.51	12.37	15.12	13794.18	27094.55	13300.38	1.46	9450.00	17562.50	8112.50	0.93
Kodo Millets	Bihar	36.00	4.70	12.25	6.50	20.75	16485.72	28792.25	12306.53	1.84	6062.50	11490.00	5427.50	0.96
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	36.00	4.70	12.25	6.50	20.75	16485.72	28792.25	12306.53	1.84	6062.50	11490.00	5427.50	0.96
Kutki	Bihar	7.00	3.50	9.65		0.00	17316.70	27020.00	9703.30	1.56	0.00	0.00	0.00	0.00
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	7.00	3.50	9.65		0.00	17316.70	27020.00	9703.30	1.56	0.00	0.00	0.00	0.00
Pearl Millets	Bihar	162.00	58.00	27.08	24.37	20.50	29338.03	79443.48	50105.47	3.00	24883.33	57952.50	33069.17	2.14
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	162.00	58.00	27.08	24.37	20.50	29338.03	79443.48	50105.47	3.00	24883.33	57952.50	33069.17	2.14
Proso Millet	Bihar	15.00	5.00	13.80	10.56	33.10	16150.00	49516.00	33366.00	3.07	15450.00	37643.50	23193.50	2.41
	Jharkhand	14.00	5.00	7.88	6.06	30.03	13085.00	35460.00	22375.00	2.71	11050.00	27270.00	16220.00	2.47
	Total	29.00	10.00	10.84	8.31	31.57	14617.50	42488.00	27870.50	2.89	13250.00	32456.75	19706.75	2.44
Pseudo Millet	Bihar	10.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	10.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
sorghum	Bihar	99.00	11.75	21.51	18.92	15.91	23664.17	58097.70	34433.53	2.45	20228.00	42211.80	21983.80	1.68
	Jharkhand	10.00	3.00	32.40	27.20	19.12	32800.00	96228.00	66428.00	2.93	27900.00	80784.00	29360.00	2.90
	Total	109.00	14.75	23.33	20.58	16.45	25186.81	64452.75	39765.94	2.53	21506.67	48640.50	23213.17	1.88
Grand Total		1572.00	426.40	17.28	13.68	18.96	21185.17	50867.90	29762.14	2.22	15183.74	32809.83	17474.91	1.44

Horticultural Crops

Bihar and Jharkhand are basically an agrarian state where mainly cereals, pulses, oilseeds and sugarcane are cultivated. Adoption of paddy-wheat cropping system has created many problems such as environmental problems, degradation of natural resources, and economic instability. To diversified the cropping system towards horticulture crop and Frontline demonstrations in horticulture (vegetables, fruits, flower, etc,) is a focal point in terms of validations of technology by KVKs. In Bihar and Jharkhand FLDs on horticulture crops covered 489.21 ha involving 4836 farmers during the year 2023 (Table).

Table: Details of Front-Line Demonstration on Horticultural Crop

State	Vegetable		Fruit		Total	
	No. of farmer	Area (ha)	No. of farmer	Area (ha)	No. of farmer	Area (ha)
Bihar	2864.00	294.04	374.00	43.20	3238.00	337.24
Jharkhand	1511.00	143.17	87.00	8.80	1598.00	151.97
Total	4375.00	437.21	461.00	52.00	4836.00	489.21

Vegetable Crop

Vegetable crops are herbaceous plants grown for human consumption, with edible parts that can include leaves, roots, stems, petioles, flower buds, and hypocotyls. In 2023, frontline demonstrations were conducted on 29 different vegetable crops such as, Amaranthus, Beans, Bitter Gourd, Bottle Guard, Brinjal, Broccoli, Cabbage, Capsicum, Cauliflower, Elephant Foot Yam, French Bean, Garden Beet, Garden Pea, Okra, Onion, Pointed Gourd, Potato, Radish, Ridge Gourd, Sponge Gourd, Tomato, Vegetable Pea, Pumpkin, Smooth Gourd, Spinach etc. covering a total area of 437.21hectares and involving 4375 farmers. Out of this, in Bihar, 294.04 hectares were covered with the participation of 2864 farmers, while in Jharkhand, 143.17 hectares were covered with the involvement of 1511 farmers. Among the vegetable crops, there was a major focus on pointed gourd, with an area of 205.32 hectares covered by the KVKs of Bihar and Jharkhand. The maximum number of farmers involves in tomato cultivation with an area of 43.29 hectare (Table).

Table: Details of Front-Line Demonstration on Vegetables Crop

Crop	state	No. of Farmers	Area (ha)	Yield (q/ha)		Increase (%)	Economics of Demonstration (Rs/ha)				Economics of Check (Rs/ha)			
				Demo	Check		Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
Amaranthus	Bihar	1.00	0.01	672.75	631.23	6.58	390.77	408.62	17.85	0.05	360.00	390.00	30.00	0.08
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.00	0.01	672.75	631.23	6.58	390.77	408.62	17.85	0.05	360.00	390.00	30.00	0.08
Beans	Bihar	1.00	0.01	411.28	386.92	6.29	390.77	447.69	56.92	0.15	378.00	420.00	42.00	0.11
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.00	0.01	411.28	386.92	6.29	390.77	447.69	56.92	0.15	378.00	420.00	42.00	0.11
Bitter gourd	Bihar	26.00	0.41	289.88	264.21	16.09	32965.64	105842.31	72876.68	1.73	31775.25	75984.50	44209.25	1.25
	Jharkhand	13.00	2.00	155.00	102.00	51.96	100000.00	341000.00	241000.00	3.41	80000.00	224400.00	144400.00	2.81
	Total	39.00	2.41	222.44	183.11	34.03	66482.82	223421.16	156938.34	2.57	55887.63	150192.25	94304.63	2.03
Bottle Guard	Bihar	10.00	3.00	334.00	269.00	24.16	80500.00	334000.00	253500.00	4.15	68000.00	269000.00	201000.00	3.96
	Jharkhand	243.00	21.00	206.43	149.73	38.25	52100.00	170875.00	118775.00	3.19	47770.00	118978.75	71208.75	2.44
	Total	253.00	24.00	270.22	209.37	31.21	66300.00	252437.50	186137.50	3.67	57885.00	193989.38	136104.38	3.20
Brinjal	Bihar	659.00	25.13	334.49	265.94	27.26	100332.93	353512.13	253179.20	3.03	104584.83	267640.56	179889.06	2.26
	Jharkhand	235.00	28.07	238.07	179.69	36.36	63775.00	223744.67	159969.67	3.47	61350.00	159757.33	98407.33	2.61
	Total	894.00	53.20	286.28	222.82	31.81	82053.97	288628.40	206574.44	3.25	82967.42	213698.95	139148.20	2.44
Brocolli	Bihar	10.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	10.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	20.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cabbage	Bihar	30.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	30.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capsicum	Bihar	27.00	1.00	79.73	66.00	20.80	123460.00	318916.00	195456.00	2.58	123460.00	264000.00	140540.00	2.14
	Jharkhand	10.00	0.40	160.40	0.00	0.00	114500.00	401000.00	286500.00	3.50	0.00	0.00	0.00	0.00
	Total	37.00	1.40	120.07	33.00	10.40	118980.00	359958.00	240978.00	3.04	61730.00	132000.00	70270.00	1.07
Cauliflower	Bihar	462.00	6.76	177.29	145.72	19.14	55085.11	184716.67	129631.56	2.48	55184.44	123894.44	74265.56	1.77
	Jharkhand	86.00	16.00	235.33	193.33	14.23	60000.00	256000.00	196000.00	3.01	56000.00	175666.67	119666.67	2.30
	Total	548.00	22.76	206.31	169.53	16.69	57542.56	220358.34	162815.78	2.75	55592.22	149780.56	96966.12	2.04
Elephandtfoot Yam	Bihar	36.00	0.35	259.83	223.53	13.21	318513.50	958483.33	639969.83	2.11	291895.17	828680.00	536784.83	1.78
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	36.00	0.35	259.83	223.53	13.21	318513.50	958483.33	639969.83	2.11	291895.17	828680.00	536784.83	1.78
French Bean	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	215.00	15.00	62.00	43.00	44.19	68000.00	186000.00	118000.00	2.74	63000.00	129000.00	66000.00	2.05
	Total	215.00	15.00	62.00	43.00	44.19	68000.00	186000.00	118000.00	2.74	63000.00	129000.00	66000.00	2.05

Crop	state	No. of Farmers	Area (ha)	Yield (q/ha)		Increase (%)	Economics of Demonstration (Rs/ha)				Economics of Check (Rs/ha)			
				Demo	Check		Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
Garden Beet	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	10.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	10.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Garden Pea	Bihar	14.00	0.40	50.50	40.00	26.25	72487.00	171869.00	99382.00	2.37	72487.00	136000.00	63513.00	1.88
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	14.00	0.40	50.50	40.00	26.25	72487.00	171869.00	99382.00	2.37	72487.00	136000.00	63513.00	1.88
Nutri – Garden	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	25.00	0.10	450.00	351.00	28.21	218750.00	320000.00	101250.00	1.46	157500.00	176400.00	18900.00	1.12
	Total	25.00	0.10	450.00	351.00	28.21	218750.00	320000.00	101250.00	1.46	157500.00	176400.00	18900.00	1.12
Okra	Bihar	263.00	10.85	132.59	106.02	21.01	89073.00	304556.53	169883.53	2.98	79104.00	217420.37	138316.37	2.46
	Jharkhand	11.00	2.20	100.75	74.71	30.82	23000.00	120750.00	73200.00	15.92	48350.00	100525.00	52175.00	1.99
	Total	274.00	13.05	116.67	90.37	25.92	56036.50	212653.27	121541.77	9.45	63727.00	158972.69	95245.69	2.23
Onion	Bihar	94.00	15.60	221.98	191.69	11.46	80405.00	249905.14	142500.14	2.36	78300.00	223705.71	145405.71	2.15
	Jharkhand	3.00	1.20	95.00	124.00	-23.39	55575.00	11400.00	58425.00	0.21	66400.00	148800.00	82400.00	2.24
	Total	97.00	16.80	158.49	157.85	-5.97	67990.00	130652.57	100462.57	1.29	72350.00	186252.86	113902.86	2.20
Pointed gourd	Bihar	63.00	205.32	50.33	41.48	7.75	118800.00	201300.00	82500.00	0.88	122800.00	176300.00	53500.00	0.76
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	63.00	205.32	50.33	41.48	7.75	118800.00	201300.00	82500.00	0.88	122800.00	176300.00	53500.00	0.76
Potato	Bihar	124.00	5.90	177.53	154.53	9.05	26493.60	154369.60	110776.00	7.22	58767.00	134824.00	76057.00	1.39
	Jharkhand	71.00	11.40	173.76	147.80	11.31	65833.80	155280.00	112226.20	1.83	63420.00	153200.00	89780.00	1.95
	Total	195.00	17.30	175.65	151.17	10.18	46163.70	154824.80	111501.10	4.53	61093.50	144012.00	82918.50	1.67
Radish	Bihar	30.00	0.50	423.00	421.70	0.31	74317.00	169200.00	94883.00	2.28	77317.00	168680.00	91363.00	2.18
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	30.00	0.50	423.00	421.70	0.31	74317.00	169200.00	94883.00	2.28	77317.00	168680.00	91363.00	2.18
Ridge Gourd	Bihar	1.00	0.01	537.72	508.46	5.75	390.77	473.08	82.31	0.21	410.00	450.00	40.00	0.10
	Jharkhand	10.00	1.00	185.00	138.00	34.06	26500.00	92800.00	66300.00	3.50	22000.00	61500.00	40500.00	2.80
	Total	11.00	1.01	361.36	323.23	19.91	13445.39	46636.54	33191.16	1.86	11205.00	30975.00	20270.00	1.45
Sponge gourd	Bihar	20.00	3.00	251.00	201.00	24.88	81200.00	376500.00	285300.00	4.64	69500.00	301500.00	232000.00	4.34
	Jharkhand	10.00	1.00	195.00	142.00	37.32	27300.00	95000.00	67700.00	3.48	20800.00	64000.00	43200.00	3.08
	Total	30.00	4.00	223.00	171.50	31.10	54250.00	235750.00	176500.00	4.06	45150.00	182750.00	137600.00	3.71
Tomato	Bihar	782.00	12.29	290.03	235.63	16.65	69939.67	255856.67	185917.00	2.77	67451.33	201393.33	136062.00	2.28
	Jharkhand	310.00	31.00	350.50	269.64	30.09	56700.00	254460.00	197760.00	4.41	53430.00	201350.00	147920.00	3.66
	Total	1092.00	43.29	320.27	252.64	23.37	63319.84	255158.34	191838.50	3.59	60440.67	201371.67	141991.00	2.97

Crop	state	No. of Farmers	Area (ha)	Yield (q/ha)		Increase (%)	Economics of Demonstration (Rs/ha)				Economics of Check (Rs/ha)			
				Demo	Check		Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
Vegetable Pea	Bihar	12.00	1.00	82.00	71.50	14.69	35600.00	164000.00	128400.00	4.61	35600.00	143000.00	107400.00	4.02
	Jharkhand	64.00	6.00	33.57	26.77	21.99	28066.67	69313.33	41246.67	1.69	24603.33	52953.33	28350.00	1.44
	Total	76.00	7.00	57.79	49.14	18.34	31833.34	116656.67	84823.34	3.15	30101.67	97976.67	67875.00	2.73
Vegetable Seed	Bihar	193.00	2.05	5.33	2.00	55.56	18333.33	53333.33	35000.00	0.97	18333.33	34666.67	16333.33	0.63
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	193.00	2.05	5.33	2.00	55.56	18333.33	53333.33	35000.00	0.97	18333.33	34666.67	16333.33	0.63
Cabage & Cauliflower	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	185.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	185.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cucurbits	Bihar	2.00	0.01	405.44	373.31	8.61	390.77	429.23	38.46	0.10	400.00	430.00	30.00	0.08
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.00	0.01	405.44	373.31	8.61	390.77	429.23	38.46	0.10	400.00	430.00	30.00	0.08
Pumpkin	Bihar	1.00	0.01	1616.59	1588.38	1.78	390.77	805.38	414.61	1.06	400.00	510.00	110.00	0.28
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.00	0.01	1616.59	1588.38	1.78	390.77	805.38	414.61	1.06	400.00	510.00	110.00	0.28
Smooth gourd	Bihar	2.00	0.01	575.51	553.69	3.94	390.77	415.38	24.61	0.06	370.00	410.00	40.00	0.11
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2.00	0.01	575.51	553.69	3.94	390.77	415.38	24.61	0.06	370.00	410.00	40.00	0.11
Spinach	Bihar	1.00	0.01	817.74	761.77	7.35	390.77	489.23	98.46	0.25	400.00	472.00	72.00	0.18
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	1.00	0.01	817.74	761.77	7.35	390.77	489.23	98.46	0.25	400.00	472.00	72.00	0.18
Grand Total		4375.00	437.21	332.75	297.27	18.28	64637.74	182412.67	117797.53	2.31	58550.82	139773.23	81732.58	1.56

Fruit Crop

Fruit crops represent a wide range of woody perennial species cultivated in orchards where soils vary greatly in their biological, chemical, and physical properties. Bihar and Jharkhand are the hub of subtropical fruits crops like Banana, Mango, Litchi, Papaya and Strawberry hence due attention was given to conduct FLD in fruit crops covering 52-hectare area involving 461 farmers during 2023. Out of the fruit's crops, the major demonstrations were done on mango in area wise, with an area of 26.6 hectare covered 108 farmers by the KVKs of Bihar and Jharkhand. The maximum farmers involve in Papaya cultivation (129 farmers) with an area of 8.4 hectare (Table).

Table: Details of Front-Line Demonstration on Fruits Crop

Crop	state	No. of Farmers	Area (ha)	Yield (q/ha)		Increase (%)	Economics of Demonstration (Rs/ha)				Economics of Check (Rs/ha)			
				Demo	Check		Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
Banana	Bihar	45.00	3.00	525.93	450.08	19.06	174083.33	621080.00	446996.67	3.88	162083.33	1508966.67	371883.33	12.48
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	45.00	3.00	525.93	450.08	19.06	174083.33	621080.00	446996.67	3.88	162083.33	1508966.67	371883.33	12.48
Cucumber	Bihar	72.00	3.00	117.50	80.00	47.05	97500.00	352500.00	255000.00	3.62	92500.00	240000.00	147500.00	2.59
	Jharkhand	25.00	4.00	130.00	100.50	29.58	48250.00	124000.00	75750.00	2.57	45250.00	97625.00	52375.00	2.16
	Total	97.00	7.00	123.75	90.25	38.32	72875.00	238250.00	165375.00	3.10	68875.00	168812.50	99937.50	2.38
Mango	Bihar	98.00	26.00	99.27	79.69	26.15	53965.33	217763.17	556086.83	2.80	61664.83	164423.83	102759.00	1.82
	Jharkhand	10.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	108.00	26.60	99.27	79.69	26.15	53965.33	217763.17	556086.83	2.80	61664.83	164423.83	102759.00	1.82
Musk melon	Bihar	58.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	58.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Papaya	Bihar	91.00	6.20	599.93	471.28	11.97	123404.18	469522.25	346118.08	3.13	120875.18	378202.50	257327.33	2.56
	Jharkhand	38.00	2.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	129.00	8.40	599.93	471.28	11.97	123404.18	469522.25	346118.08	3.13	120875.18	378202.50	257327.33	2.56
Pine apple	Bihar	10.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	10.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
Water melon	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	14.00	2.00	182.00	148.00	22.97	60000.00	218400.00	158400.00	3.64	50000.00	177600.00	127600.00	3.55
	Total	14.00	2.00	182.00	148.00	22.97	60000.00	218400.00	158400.00	3.64	50000.00	177600.00	127600.00	3.55
Grand Total		461.00	52.00	306.18	247.86	23.69	96865.57	353003.08	334595.32	3.31	92699.67	479601.10	191901.43	4.56

Livestock and Fisheries

The KVKs of ICAR-ATARI Zone-IV conducted front line demonstrations on livestock and fisheries, focusing on various aspects such as promotional livestock breed, feed and fodder management, animal vaccination, deworming, pond management, stocking density, fish production, and fingerling production. A total of 2848 farmers participated in the livestock demonstrations, which involved 11834 units. Among these, 2574 farmers were from Bihar, and 274 farmers were from Jharkhand. In the fisheries sector, a total of 112 farmers participated in the fisheries demonstrations, which involved 102.5 hectare land area. Among these, 103 farmers were from Bihar, and 9 farmers were from Jharkhand (Table).

Table: Details of Front-Line Demonstration on Livestock and Fisheries

Sl.No.		state	No. of Farmer	No. of units
1	Fisheries	Bihar	103.00	96.50
		Jharkhand	9.00	6.00
		Total	112.00	102.50
2	Livestock	Bihar	2574.00	9381.00
		Jharkhand	274.00	2453.00
		Total	2848.00	11834.00
Grand Total			2960.00	11936.50

Livestock

Livestock are the domesticated animals raised in an agricultural setting in order to provide labour and produce diversified products for consumption such as meat, eggs, milk, fur, leather, and wool. The KVKs of ICAR-ATARI Zone-IV conducted front line demonstrations on livestock focusing on various enterprises like Buffalo, Cow, Duckery, Piggery, Poultry, Sheep and Goat. A total 2848 farmers participated in livestock FLD having 11834 units. Maximum number of farmers participated in Poultry (975farmers) (Table).

Table: Details of Front-Line Demonstration on Livestock

Crop	state	No. of Farmers	No. of unit	Yield		Increase (%)	Economics of Demonstration (Rs/unit)				Economics of Check (Rs/unit)			
				Demo	Check		Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
Buffalo	Bihar	20.00	20.00	0.00	0.00	0.00	16920.00	32610.00	15690.00	1.93	13500.00	24900.00	11400.00	1.84
	Jharkhand	40.00	2000.00	1540.00	1400.00	10.00	20000.00	53900.00	33900.00	2.69	19400.00	49000.00	29600.00	2.52
	Total	60.00	2020.00	1540.00	1400.00	10.00	18460.00	43255.00	24795.00	2.31	16450.00	36950.00	20500.00	2.18
Cow	Bihar	1003.00	1532.00	457.68	386.66	26.73	15322.40	37395.21	22072.81	1.78	13393.63	29196.53	15802.90	1.57
	Jharkhand	25.00	100.00	950.00	800.00	18.75	12600.00	33250.00	20650.00	2.64	12100.00	28000.00	15900.00	2.31
	Total	1028.00	1632.00	703.84	593.33	22.74	13961.20	35322.60	21361.40	2.21	12746.81	28598.26	15851.45	1.94
Duckery	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	35.00	5.00	260.00	200.00	77.00	300.00	350.00	50.00	1.66	350.00	400.00	50.00	1.14
	Total	35.00	5.00	260.00	200.00	77.00	300.00	350.00	50.00	1.66	350.00	400.00	50.00	1.14
Piggery	Bihar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Jharkhand	10.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	10.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poultry	Bihar	821.00	5540.00	98.38	90.11	25.98	61269.18	165012.00	103742.80	2.65	53271.18	114118.10	60846.91	2.02
	Jharkhand	154.00	308.00	549.96	523.93	25.99	62577.20	87224.40	24647.40	1.64	64032.60	83541.60	19509.00	2.44
	Total	975.00	5848.00	324.17	307.02	25.99	61923.19	126118.20	64195.11	2.15	58651.89	98829.85	40177.96	2.23
Sheep and Goat	Bihar	730.00	2289.00	30.42	20.33	15.83	30715.57	74451.43	43735.86	1.12	29992.29	46566.43	15140.72	0.91
	Jharkhand	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
	Total	740.00	2299.00	30.42	20.33	15.83	30715.57	74451.43	43735.86	1.12	29992.29	46566.43	15140.72	0.91
Grant Total		2848.00	11834.00	571.69	504.14	30.31	25071.99	55899.45	30827.47	1.89	23638.20	42268.91	18344.03	1.68

Fisheries

Fisheries is an economic activity that involves harvesting fish or any aquatic organism from the wild (Capture Fisheries) or raising them in confinement (Culture Fisheries/ Aquaculture). In recent years, the government has prioritized the fisheries farming. The KVKs of ICAR-ATARI Patna conducted front line demonstration on fisheries during reporting year 2023.The total 112 farmers involves in the fisheries farming with an area of 102.5 hectare. Among these, 103 farmers were from Bihar, and 9 farmers were from Jharkhand (Table).

Table: Details of Front-Line Demonstration on Fisheries

Crop	state	No. of Farmers	Area (ha)	Yield (q/ha)		Increase	Economics of Demonstration (Rs/ha)				Economics of Check (Rs/ha)			
				Demo	Check	(%)	Gross Cost	Gross Return	Net Return	BCR	Gross Cost	Gross Return	Net Return	BCR
Common carps	Bihar	57.00	75.00	36.09	27.84	33.68	78125.64	253951.38	180825.74	2.77	71000.68	178751.01	107537.84	1.99
	Jharkhand	9.00	6.00	7.55	4.20	79.76	46200.00	188750.00	142550.00	4.08	42800.00	105000.00	62200.00	2.45
	Total	66.00	81.00	21.82	16.02	56.72	62162.82	221350.69	161687.87	3.43	56900.34	141875.51	84868.92	2.22
Other	Bihar	46.00	21.50	103.06	72.42	37.13	192728.00	636577.00	444849.00	3.03	158500.00	454220.00	295720.00	2.49
	Jharkhand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	46.00	21.50	103.06	72.42	37.13	192728.00	636577.00	444849.00	3.03	158500.00	454220.00	295720.00	2.49
Grand Total		112.00	102.50	62.44	44.22	46.93	127445.41	428963.85	303268.44	3.23	107700.17	298047.75	190294.46	2.36

Other Enterprises

In addition to conducting demonstrations on field crops, horticultural crops, livestock, and fisheries, the KVKs also organized demonstrations on various agro-enterprises in farmers' fields. These demonstrations aimed to showcase the relative advantages of improved technologies compared to conventional practices and introduce new income-generating enterprises. A total of 1658 farmers were involved in these activities, covering 6617 units. The demonstrations included vermicompost production, beekeeping, value addition, mushroom cultivation, backyard poultry rearing, homestead vegetable cultivation, feed production, azolla cultivation, and many other enterprises undertaken by the KVKs. In Bihar, the KVKs conducted 1897 units involving 1237 farmers, while in Jharkhand, 4720 were demonstrated, with the participation of 421 farmers during the reporting year 2023 (Table).

Table: Details of Front-Line Demonstration onOther Enterprises

S.No.	Category	State	No. of Farmers	No. of units
1	Enterprise	Bihar	1237.00	1897.00
		Jharkhand	421.00	4720.00
Grand Total			**1658.00**	**6617.00**

Women Empowerment

In order to empower farm women and involve them in decision-making processes and income generating activities, advanced agro-techniques were demonstrated. These demonstrations focused on various activities such as tailoring, value addition, embroidery, and other related skills. A total of 2596 women participated in these initiatives, with 1521 women from Bihar and 1075 women from Jharkhand state (Table). The aim of these

demonstrations was to enhance the economic independence and decision-making capabilities of farm women, enabling them to contribute actively to their households and communities.

Table: Details of Front-Line Demonstration on Women Empowerment

S.No.	Category	State	Sum of No. of Beneficiaries
1	Women Empowerment	Bihar	1521.00
		Jharkhand	1075.00
Grand Total			2596.00

Farm Implements

Farm machinery, tools, and implements play a crucial role in reducing labour requirements, minimizing seed usage, improving water use efficiency, and alleviating physical strain on farmers. In the ICAR-ATARI Zone-IV, various types of farm machinery, tools, and implements were demonstrated to benefit a total of 2586 farmers having 1197 farm implements. Among these demonstrations, the KVKs of Bihar 1533 farmers benefited with 671 farm implements and in KVKs of Jharkhand 1053 farmers benefited with 526 farm implements. These efforts aimed to highlight the advantages and encourage the adoption of modern agricultural machinery for improved farming practices in the region (Table).

Table: Details of Front-Line Demonstration on Farm Implements

S. No.	Category	State	No. of Farmer	Number of implements
1	Farm Implements	Bihar	1533.00	671.00
		Jharkhand	1053.00	526.00
Grand Total			2586.00	1197.00

F1 Hybrid Seed

In Bihar and Jharkhand majority of farmers are small and marginal with small and fragmented plots. In order to bring more areas under the use of hybrid varieties for getting higher return, Front Line Demonstrations were conducted on adopting F1 hybrid varieties of different crops by farmers KVKs of Bihar and Jharkhand demonstrating in 737.69 hectares area involving 3872 farmers (Table).

Table: Details of Front-Line Demonstration on F1 Hybrid Seed

S. No.	Category	State	Sum of No. of Farmers	Sum of Area (ha)
1	F1 Hybrid Seed	Bihar	803.00	102.69
		Jharkhand	3069.00	635.00
Grand Total			3872.00	737.69

CLUSTER FRONT LINE DEMONSTRATION (CFLD) ON OILSEEDS.

For enhancement of oilseed production and productivity in India. Government of India was striving to increase oilseeds production, ICAR has taken key initiative to enhance oilseeds production and productivity by conducting nationwide Cluster Front Line Demonstrations through a wide network of Krishi Vigyan Kendras. ICAR has implemented a collaborative project "Cluster Front Line Demonstrations on Oilseeds" since October 2015 under National Food Security Mission with the financial assistance of Department of Agriculture & Cooperation, Ministry of Agriculture & Farmers Welfare, GOI, New Delhi. Krishi Vigyan Kendras are facilitating farmers with quality seeds and proven technological packages. This initiative lays emphasis on major oilseed crops, namely soybean, sesame, niger, sunflower, mustard, linseed and safflower. Under ICAR-ATARI, Zone-IV, Patna, 61 KVKs are actively involved to demonstrate proven technological packages of oilseeds for higher productivity and profitability. Total 61 KVKs including 39 KVKs from Bihar & 22 KVKs from Jharkhand were actively demonstrated production potentialities of oilseeds during Kharif, Rabi and Summer season.

During 2023-24, total of 11290 CFLDs were laid out in the 4020 ha area under different micro-farming situations of selected districts under Oilseeds crops. Results of CFLDs has shown encouraging potentials, the average yield was increased by 41.03 % and average difference of yield between demonstration and local practice was 3.09 (q/ha).Total 5970 CFLDs were laid out in the 2090 ha area and yield was increased by 39.19% and average difference of yield between demonstration and local practice was 3.75 (q/ha) in Bihar state similarly total 5320 CFLDs were laid out in the 1930 ha area and yield was increased by42.87% and average difference of yield between demonstration and local practice was 2.43 (q/ha) in Jharkhand state (Table 00.)

Table 00:State wise details of Cluster Front Line Demonstration on Oilseeds

Sl. No.	State	Target of CFLD Approved		Achievement of CFLD		Yield(q/ha)		Yield Increased (%)	Average difference of yield between Demo and Local (q/ha)
		Area (ha)	No. of Demonstration	Area (ha)	No. of Demonstration	Local	Demo		
1	Bihar	2090	5225	2090	5970	9.73	13.48	39.19	3.75
2	Jharkhand	2030	5075	1930	5320	5.82	8.31	42.87	2.43
Grand Total		**4120**	**10300**	**4020**	**11290**	**7.78**	**10.90**	**41.03**	**3.09**

Cluster Front Line Demonstration on oilseed during Kharif season

Total 26 KVKs including 6KVKs from Bihar & 20 KVKs from Jharkhand were actively demonstrated production potentialities of oilseedsduring 2023-24.The CFLD program focused on various oilseed crops such as Niger, Soybean, Sesame, and Sunflower. Total of 2561 CFLDs were laid out in the 920 ha area under different micro-farming situations of selected districts. Results of CFLDs has shown encouraging potentials, the average yield was increased by 31.48 % and average difference of

yield between demonstration and local practice was 2.0 (q/ha). Among the different oilseed crops, the highest number of demonstrations 904 were laid out for Niger cultivation with an area of 310 hectares and yield was increased by 27.97% and average difference of yield between demonstration and local practice was 1.07(q/ha) in Bihar and Jharkhand states. Total 61 CFLDs were laid out in the 20 ha area and yield was increased by 19.32% and average difference of yield between demonstration and local practice was 0.85 (q/ha) in Bihar state similarly total 843 CFLDs were laid out in the 290 ha area and yield was increased by 36.62% and average difference of yield between demonstration and local practice was 1.29 (q/ha) in Jharkhand state.Total 698 CFLDs were laid out in 260 ha area in Sesame and yield was increased by 35.55% and average difference of yield between demonstration and local practice was 1.34 (q/ha) in Bihar and Jharkhand states. Total 111 CFLDs were laid out in the 40 ha area and yield was increased by 31.57% and average difference of yield between demonstration and local practice was 1.24 (q/ha) in Bihar state similarly total 587 CFLDs were laid out in the 220 ha area and yield was increased by 39.54% and average difference of yield between demonstration and local practice was 1.43 (q/ha) in Jharkhand state.Total 467 CFLDs were laid out in 170 ha area in Soybean and yield was increased by 33.53% and average difference of yield between demonstration and local practice was 3.35 (q/ha) in Bihar and Jharkhand states. Total 279 CFLDs were laid out in the 100 ha area and yield was increased by 36.20% and average difference of yield between demonstration and local practice was 4.08 (q/ha) in Bihar state similarly total 188 CFLDs were laid out in the 70 ha area and yield was increased by 30.86% and average difference of yield between demonstration and local practice was 2.62 (q/ha) in Jharkhand state.Total 492 CFLDs were laid out in 180 ha area in Sunflower and yield was increased by 28.85% and average difference of yield between demonstration and local practice was 2.22(q/ha) in Bihar and Jharkhand states. Total 62 CFLDs were laid out in the 20 ha area and yield was increased by 21.84% and average difference of yield between demonstration and local practice was 2.14(q/ha) in Bihar state similarly total 430 CFLDs were laid out in the 160 ha area and yield was increased by35.86% and average difference of yield between demonstration and local practice was 2.31(q/ha) in Jharkhand state.

Table : Cluster Frontline Demonstration on Kharif Oilseed

Sl. No.	Crop	State	Target of CFLD Approved		Achievement of CFLD		Yield(q/ha)		Yield Increase (%)	Average difference of yield between Demo and Local (q/ha)
			Area (ha)	No. of Demonstration	Area (ha)	No. of Demonstration	Local	Demo		
1	Niger	Bihar	20	50	20	61	4.40	5.25	19.32	0.85
		Jharkhand	300	750	290	843	3.96	5.32	36.62	1.29
		Total	320	800	310	904	4.18	5.29	27.97	1.07
2	Sesame	Bihar	40	100	40	111	4.02	5.26	31.57	1.24
		Jharkhand	240	600	220	587	4.01	5.55	39.54	1.43
		Total	280	700	260	698	4.02	5.40	35.55	1.34

Sl. No.	Crop	State	Target of CFLD Approved		Achievement of CFLD		Yield(q/ha)		Yield Increase (%)	Average difference of yield between Demo and Local (q/ha)
			Area (ha)	No. of Demonstration	Area (ha)	No. of Demonstration	Local	Demo		
3	Soybean	Bihar	100	250	100	279	12.04	16.12	36.20	4.08
		Jharkhand	70	175	70	188	8.51	11.14	30.86	2.62
		Total	170	425	170	467	10.28	13.63	33.53	3.35
4	Sunflower	Bihar	20	50	20	62	9.80	11.94	21.84	2.14
		Jharkhand	160	400	160	430	6.43	8.73	35.86	2.31
		Total	180	450	180	492	8.11	10.34	28.85	2.22
Grand Total			950	2375	920	2561	6.65	8.66	31.48	2.00

Cluster Front Line Demonstration on Oilseeds during Rabi season

Total 61 KVKs including 39KVKs from Bihar & 22 KVKs from Jharkhand were actively demonstrated production potentialities of oilseeds during 2023-24.Total 8729 CFLDs were laid out in the 3100 ha area under different micro-farming situations in selected districts in different oilseeds crops such as linseed, mustard, safflower, sesame and sunflower. Results of CFLDs has shown encouraging potentials, the average yield was increased by 48.56% and average difference of yield between demonstration and local practice was 3.09 (q/ha).6868CFLDswere laid out with an area of 2460 ha in mustard crop and yield was increased by 45.95% and average difference of yield between demonstration and local practice was 4.06(q/ha) in Bihar and Jharkhand states. Total 4882 CFLDs were laid out in the 1750 ha area and yield was increased by 41.42% and average difference of yield between demonstration and local practice was 4.18 (q/ha) in Bihar state similarly total 1986 CFLDs were laid out in the 710 ha area and yield was increased by 50.48% and average difference of yield between demonstration and local practice was 3.94 (q/ha) in Jharkhand state. Total 1306 CFLDs were laid out in 430 ha area in linseed and yield was increased by 41.70% and average difference of yield between demonstration and local practice was 2.44 (q/ha) in Bihar and Jharkhand states. Total 500 CFLDs were laid out in the 130 ha area and yield was increased by 36.99% and average difference of yield between demonstration and local practice was 2.52(q/ha) in Bihar state similarly total 806 CFLDs were laid out in the 300 ha area and yield was increased by 46.40% and average difference of yield between demonstration and local practice was 2.35(q/ha) in Jharkhand state in linseed. Total 75 CFLDs were laid out in 30 ha area in safflower and yield was increased by 65.74% and average difference of yield between demonstration and local practice was 2.37 (q/ha) in Jharkhand states. Total 78 CFLDs were laid out in 30 ha area in sesame and yield was increased by 48.39% and average difference of yield between demonstration and local practice was 2.16 (q/ha) in Jharkhand states. Total 402 CFLDs were laid out in 150 ha area in sunflower and yield was increased by 41.03% and average difference of yield between demonstration and local practice was 4.44 (q/ha) in Bihar and Jharkhand states. Total 75 CFLDs were laid out in the 30 ha area and yield was increased by 40.18% and average difference of yield between demonstration and local practice was 5.79 (q/ha) in Bihar state

similarly total 327 CFLDs were laid out in the 120 ha area and yield was increased by41.87% and average difference of yield between demonstration and local practice was 3.08(q/ha) in Jharkhand state.

Table : Cluster Frontline Demonstration on Rabi Oilseed

S. No.	Crop	State	Target of CFLD Approved		Achievement of CFLD		Yield (q/ha)		Yield Increase (%)	Average difference of yield between Demo and Local (q/ha)
			Area (ha)	No. of Demo	Area (ha)	No. of Demo	Local	Demo		
1	Linseed	Bihar	130	325	130	500	7.55	10.07	36.99	2.52
		Jharkhand	310	775	300	806	5.39	7.86	46.40	2.35
		Total	**440**	**1100**	**430**	**1306**	**6.47**	**8.97**	**41.70**	**2.44**
2	Mustard	Bihar	1750	4375	1750	4882	10.24	14.42	41.42	4.18
		Jharkhand	750	1875	710	1986	8.00	11.93	50.48	3.94
		Total	**2500**	**6250**	**2460**	**6868**	**9.12**	**13.18**	**45.95**	**4.06**
3	Safflower	Bihar	00	00	00	00	00	00	00	00
		Jharkhand	30	75	30	75	3.60	5.97	65.74	2.37
		Total	**30**	**75**	**30**	**75**	**3.60**	**5.97**	**65.74**	**2.37**
4	Sesame	Bihar	00	00	00	00	00	00	00	00
		Jharkhand	30	75	30	78	4.27	6.42	48.39	2.16
		Total	**30**	**75**	**30**	**78**	**4.27**	**6.42**	**48.39**	**2.16**
5	Sunflower	Bihar	30	75	30	75	14.74	20.53	40.18	5.79
		Jharkhand	140	350	120	327	6.75	9.75	41.87	3.08
		Total	**170**	**425**	**150**	**402**	**10.75**	**15.14**	**41.03**	**4.44**
Grand Total			**3170**	**7925**	**3100**	**8729**	**6.84**	**9.93**	**48.56**	**3.09**

Cluster Front Line Demonstration on oilseeds during Summer season

Total 24 KVKs including 9 KVKs from Bihar &15 KVKs from Jharkhand were actively demonstrated production potentialities of oilseeds during summer season in 2022-23. Total 1018 CFLDs were laid out in 394 ha area under different micro-farming situations in selected districts in sesame and sunflower crops. Results of CFLDs has shown encouraging potentials, the average yield was increased by 30.24% and average difference of yield between demonstration and local practice was 1.78(q/ha) Bihar and Jharkhand states.Total 410 CFLDs were laid out in 154 ha area in sesame and yield was increased by 34.05% and average difference of yield between demonstration and local practice was 1.33(q/ha) in Bihar and Jharkhand states. Total 276 CFLDs were laid out in the 104 ha area and yield was increased by 27.67 % and average difference of yield between demonstration and local practice was 1.19 (q/ha) in Bihar state similarly total 134 CFLDs were laid out in the 50 ha area and yield was increased by40.44% and average difference of yield between demonstration and local practice was 1.48 (q/ha) in Jharkhand state. Total 608 CFLDs were laid out in 240 ha area in sunflower and yield was increased by 26.41% and average difference of yield between demonstration and local practice was 2.22(q/ha) in Bihar and Jharkhand states. Total 279 CFLDs were laid

out in the 110 ha area and yield was increased by 16.73% and average difference of yield between demonstration and local practice was 2.36(q/ha) in Bihar state similarly total 329 CFLDs were laid out in the 130 ha area and yield was increased by 36.10% and average difference of yield between demonstration and local practice was 2.09(q/ha) in Jharkhand state.

Table : Cluster Frontline Demonstration on summer Oilseed 2022-23

S. No.	Crops	State	Target of FLDs approved		Achievements of FLDs		Yield (q/ha)		Yield increase (%)	Average difference of yield between Demo and Local (q/ha)
			Area (ha)	No. of Demos	Area (ha)	No. of Demos	Local	Demo		
1	Groundnut	Bihar	10	25	0	0	0	0	0	0
		Total	**10**	**25**	**0**	**0**	**0**	**0**	**0**	**0**
2	Sesame	Bihar	100	250	104	276	4.3	5.49	27.67	1.19
		Jharkhand	50	125	50	134	3.66	5.14	40.44	1.48
		Total	**150**	**375**	**154**	**410**	**3.98**	**5.31**	**34.05**	**1.33**
3	Sunflower	Bihar	100	250	110	279	14.11	16.47	16.73	2.36
		Jharkhand	180	450	130	329	5.79	7.88	36.10	2.09
		Total	**280**	**700**	**240**	**608**	**9.95**	**12.17**	**26.41**	**2.225**
Grand total			**440**	**1100**	**394**	**1018**	**6.97**	**8.75**	**30.24**	**1.78**

CLUSTER FRONT LINE DEMONSTRATION (CFLD)

Pulses are rich source of protein and occupy a unique place in the world by its high protein content, which is almost double than that of cereals. Government of India was striving to increase pulse production, ICAR has taken key initiative to enhance pulse production and productivity by conducting nationwide Cluster Front Line Demonstrations through a wide network of Krishi Vigyan Kendras. ICAR has implemented a collaborative project "Cluster Front Line Demonstrations on Pulses" since October 2015 under National Food Security Mission with the financial assistance of Department of Agriculture & Cooperation, Ministry of Agriculture & Farmers Welfare, GOI, New Delhi. Krishi Vigyan Kendras are facilitating farmers with quality seeds and proven technological packages. This initiative lays emphasis on major pulse crops, namely pigeon pea, green gram, black gram, moth bean, chickpea and lentil. Under ICAR-ATARI, Zone-IV, Patna, 53 KVKs are actively involved to demonstrate proven technological packages of pulses for higher productivity and profitability. Total 55 KVKs including 33 KVKs from Bihar & 22 KVKs from Jharkhand were actively demonstrated production potentialities of pulses during Kharif, Rabi and Summer season. During 2023-24, a total of 6661 CFLDs were laid out in the 2349 ha area under different micro-farming situations of selected districts. Total 1717 CFLDs were laid out in the 579 ha area and yield was increased by 30.59% and average difference of yield between demonstration and local practice was 2.91 (q/ha) in Bihar state similarly total 4944 CFLDs were laid out in the 1770 ha area and yield was increased by 44.07% and average difference of yield between demonstration and local practice was 3.42 (q/ha) in Jharkhand state.

Table : State-wise details of cluster front line demonstration on pulses

Sl. No.	State	Target of CFLD Approved		Achievement of CFLD		Average Yield (q/ha)		Yield Increase (%)	Average difference of yield between Demo and Local (q/ha)
		Area (ha)	No. of Demonstration	Area (ha)	No. of Demonstration	Demo	Local		
1	Bihar	600	1500	579	1717	12.42	9.51	30.59	2.91
2	Jharkhand	1840	4600	1770	4944	11.18	7.76	44.07	3.42
Grand Total		2440	6100	2349	6661	11.59	8.35	38.80	3.25

Cluster Front Line Demonstration on pulses during kharif season

Total 22 KVKs of Jharkhand state were actively demonstrated production potentialities of pulses during 2023-24, a total of 3745 CFLDs were laid out in the 1350 ha area under different micro-farming situations of selected districts. Results of CFLDs has shown encouraging potentials, the average yield was increased by 47.10% and average difference of yield between demonstration and local practice was 3.82 (q/ha). Total 1291 CFLDs were laid out in the 460 ha area in black gram 2454 CFLDs were laid out in the 890 ha area in pigeon pea. Result shows that yield was increased by 46.49% and average difference of yield between demonstration and local practice was 3.39 (q/ha) in black gram similarly yield was increased by 47.40 % and average difference of yield between demonstration and local practice was 4.21 (q/ha) in pigeon pea crop.

Table: Details of cluster front line demonstration in kharif season

Sl. No.	Crop	State	Target of CFLD Approved		Achievement of CFLD		Average Yield (q/ha)		Yield Increase (%)	Average difference of yield between Demo and Local (q/ha)
			Area (ha)	No. of Demonstration	Area (ha)	No. of Demonstration	Demo	Local		
1	Black Gram	Jharkhand	500	1250	460	1291	10.65	7.27	46.49	3.39
2	Pigeon Pea	Jharkhand	900	2250	890	2454	13.09	8.88	47.40	4.21
Grand Total			1400	3500	1350	3745	11.93	8.11	47.10	3.82

Cluster Front Line Demonstration on pulses during rabi season

Total 55 KVKs including 33 KVKs from Bihar and 22 KVKs from Jharkhand were actively demonstrated production potentialities of pulses during 2023-24 Rabi season. A total of 2916 CFLDs were laid out in the 999 ha area under different micro-farming situations of selected districts in lentil crop. Results of CFLDs has shown encouraging potentials, the average yield was increased by 32.91% and average difference of yield between demonstration and local practice was 2.85 (q/ha). Total 1717 CFLDs were laid out in the 579-ha area and yield was increased by 30.59% and average difference of yield between demonstration and local practice was 2.91 (q/ha) in Bihar state in lentil crop similarly total 1199 CFLDs were laid out in the 420-ha area and yield was increased by 37.36% and average difference of yield between demonstration and local practice was 2.78 (q/ha) in Jharkhand state in lentil crop.

Table: Details of cluster front line demonstration in rabi season

Sl. No.	Crop	State	Target of CFLD Approved		Achievement of CFLD		Average Yield (q/ha)		Yield Increase (%)	Average difference of yield between Demo and Local (q/ha)
			Area (ha)	No. of Demonstration	Area (ha)	No. of Demonstration	Demo	Local		
1	Lentil	Bihar	600	1500	579	1717	12.42	9.51	30.59	2.91
2		Jharkhand	440	1100	420	1199	10.22	7.44	37.36	2.78
Grand Total			1040	2600	999	2916	11.55	8.49	32.91	2.85

Cluster Front Line Demonstration on pulses during summer season

Total 55 KVKs including 43 KVKs from Bihar & 12 KVKs from Jharkhand were actively demonstrated production potentialities of pulses during 2022-23 summer season. A total of 2659 CFLDs were laid out in the 935 ha area under different micro-farming situations of selected districts in green gram and black gram crop. Out of which 2370 CFLDs were laid out in the 835 ha area in green gram in Bihar and Jharkhand state. 2061 CFLDs were laid out in the 715 ha area under green gram in Bihar and 309 CFLDs were laid out in the 120 ha area under green gram in Jharkhand. 289 CFLDs were laid out in the 100 ha area in black gram in the both state. 211 CFLDs were laid out in the 70 ha area under black gram in Bihar and 78 CFLDs were laid out in the 30 ha area under black gram in Jharkhand. Results of CFLDs has shown encouraging potentials. The overall yield was increased by 33.41% and average difference of yield between demonstration and local practice was 2.25 (q/ha) in green gram in both the states. The average yield was increased by 30.42% and average difference of yield between demonstration and local practice was 2.06 (q/ha)

and 36.40% and average difference of yield between demonstration and local practice was 2.44 (q/ha) in green gram in Bihar and Jharkhand state respectively. The overall yield was increased by 33.01% and average difference of yield between demonstration and local practice was 2.29 (q/ha) in black gram in both the states. The average yield was increased by 31.78% and average difference of yield between demonstration and local practice was 2.08 (q/ha) and 34.23% and average difference of yield between demonstration and local practice was 2.50 (q/ha) in black gram in Bihar and Jharkhand state respectively.

Table: Details of Cluster Frontline Demonstration on summer season

Sl. No.	Crop	State	Target of CFLD Approved		Achievement of CFLD		Average Yield (q/ha)		Yield Increase (%)	Average difference of yield between Demo and Local (q/ha)
			Area (ha)	No. of Demonstration	Area (ha)	No. of Demonstration	Demo	Local		
1	Green gram	Bihar	730	1825	715	2061	9.03	6.97	30.42	2.06
		Jharkhand	140	350	120	309	9.40	6.96	36.40	2.44
		Total	870	2175	835	2370	9.22	6.97	33.41	2.25
2	Black gram	Bihar	70	175	70	211	8.87	6.79	31.78	2.08
		Jharkhand	30	75	30	78	9.85	7.35	34.23	2.5
		Total	100	250	100	289	9.36	7.07	33.01	2.29
Grand Total			970	2425	935	2659	9.27	7.02	33.21	2.27

Training Programme for farmers and farm women

Adequate knowledge and technological proficiency play a critical role in advancing agriculture through adoption and implementation of improved and advance technologies. KVK acts a connecting bridge to provide knowledge and skills related to novel technologies created by universities and research centres especially designed for farming communities. To achieve this, KVK provide, both on-campus and off-campus training programmes to not only farmers but also rural youths, extension workers and women. Interested farmers and farm women have to registered with great anticipation in order to obtain up-to-date information and the new technology interventions in the agricultural fields. In addition, rural youth also showing a strong interest in practical skill development courses that are focused on certain sector related to agriculture in their own district.

A total of 2,05,501 farmers have benefited from 6,375 training courses that KVKs have arranged this year on different topics related to agriculture and its allied sectors namely cereal crop cultivation, vegetable and fruit production, ornamental plant cultivation, plantation crop management, livestock production and management, home science and women empowerment, agricultural engineering, plant protection, fisheries development, on-site input production, capacity building, group dynamics, agroforestry, and other relevant fields. Among the participants, there were 13,4479 male farmers, including 21,975 from SC and 16,351 from ST communities, whilst farm women made up 71,022, including 21,604 from SC and 16,057 from ST (Table 00).

Table 00: State-wise details of training programme for practising farmers & farm women

State	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
Bihar	4681	84464	24446	108910	17811	17834	35645	3108	2719	5827	105383	44999	150382
Jharkhand	1694	11689	8915	20604	4164	3770	7934	13243	13338	26581	29096	26023	55119
Total	**6375**	**96153**	**33361**	**129514**	**21975**	**21604**	**43579**	**16351**	**16057**	**32408**	**134479**	**71022**	**205501**

Thematic area wise training programmes

After a thorough analysis of the training programmes offered under Zone IV, it was revealed that, of the 6375 training programmes, 1532 were in the field of crop production, and 907 were in horticulture. These training covered a variety of topics, including the production of vegetables (588), fruits (207), ornamental plants (36), tuber crops (21), plantation crops (20),aromatic and medicinal plants (19)and spices (16). Similarly, as indicated in the Table 00, KVK has offered skill training in the areas of plant protection (846),home science (752) agricultural engineering (761),soil health and fertility management (608)and livestockproduction and management (443) (Table 00).

Table 00: Thematic area wise details of training programs of crop production

Thematic area		No. of Courses	No. of Participants									Grand Total		
			Other			SC			ST					
			M	F	T	M	F	T	M	F	T	M	F	T
I. Crop Production		1532	27793	7154	34947	5417	3373	8790	5506	5117	10623	38716	15644	54360
Horti-culture	a) Vegetable Crops	588	8417	2802	11219	2335	2019	4354	1510	1652	3162	12262	6473	18735
	b) Fruits	207	2717	735	3452	624	542	1166	414	499	913	3755	1776	5531
	c) Ornamental Plants	36	444	91	535	140	67	207	135	93	228	719	251	970
	d) Plantation crops	20	201	138	339	116	77	193	36	86	122	353	301	654
	e) Tuber crops	21	294	89	383	98	41	139	32	16	48	424	146	570
	f) Spices	16	159	96	255	37	38	75	88	116	204	284	250	534
	g) Medicinal and Aromatic Plants	19	225	44	269	97	68	165	36	53	89	358	165	523
	Sub Total	**907**	**12457**	**3995**	**16452**	**3447**	**2852**	**6299**	**2251**	**2515**	**4766**	**18155**	**9362**	**27517**
Soil Health and Fertility Management		608	10270	2579	12849	1892	1124	3016	2405	1720	4125	14567	5423	19990
Livestock Production and Management		443	5354	1640	6994	1865	2056	3921	1456	1210	2666	8675	4906	13581
Home Science/Women empowerment		752	4976	8510	13486	1664	5651	7315	572	1857	2429	7212	16018	23230
Agril. Engineering		761	12677	3226	15903	2863	2236	5099	1278	1016	2294	16818	6478	23296
Plant Protection		846	15792	3945	19737	3287	3218	6505	1489	1255	2744	20568	8418	28986
Fisheries		194	3118	713	3831	536	264	800	188	141	329	3842	1118	4960
Production of Inputs at site		92	873	431	1304	225	166	391	525	641	1166	1623	1238	2861
Capacity Building and Group Dynamics		220	2702	1052	3754	746	651	1397	540	490	1030	3988	2193	6181
Agroforestry		20	141	116	257	33	13	46	141	95	236	315	224	539
Grand Total		**6375**	**96153**	**33361**	**129514**	**21975**	**21604**	**43579**	**16351**	**16057**	**32408**	**134479**	**71022**	**205501**

I. Crop Production

A thorough categorization of the KVKs' thematically arranged training programmes revealed that 68 KVKs offered a total of 1532 training in the subject of crop production. 54360 farmers benefited from these courses, 15644 of them were farm women. Out of all the sub-thematic areas, integrated crop management had the highest courses (317), with10107 farmers including 2870 farm women participation. 5063 no. of farmers and1128 of them were farm women, enrolled in the 158 weed management courses that were offered. Furthermore, KVKs conducted training in various sub-thematic areas such cropping systems (143 courses), resource conservation technologies (143 courses), seed production (111 courses), water management (109 courses), crop diversification (93 courses), and integrated farming (58 courses). The data also showed that there was substantial participation in all these sub-thematic areas

from farmers in crop production training(Table 00).

Table 00:Details of training programme for cropproduction

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
I. Crop Production		M	F	T	M	F	T	M	F	T	M	F	T
Crop Diversification	93	1719	306	2025	240	213	453	261	283	544	2220	802	3022
Cropping Systems	143	3161	630	3791	764	371	1135	462	434	896	4387	1435	5822
Integrated Crop Management	317	5076	1226	6302	929	491	1420	1232	1153	2385	7237	2870	10107
Integrated Farming	58	1270	323	1593	252	149	401	251	192	443	1773	664	2437
Nursery management	29	278	53	331	135	117	252	125	75	200	538	245	783
Productionof organic inputs	65	987	400	1387	193	198	391	232	333	565	1412	931	2343
Resource Conservation Technologies	143	2892	599	3491	409	158	567	375	264	639	3676	1021	4697
Seed production	111	1766	217	1983	280	146	426	353	465	818	2399	828	3227
Water Management	109	1540	1609	3149	310	437	747	412	753	1165	2262	2799	5061
Weed Management	158	3074	540	3614	465	326	791	396	262	658	3935	1128	5063
Fodder production	21	351	60	411	83	38	121	124	61	185	558	159	717
Others, if any	285	5679	1191	6870	1357	729	2086	1283	842	2125	8319	2762	11081
Total	**1532**	**27793**	**7154**	**34947**	**5417**	**3373**	**8790**	**5506**	**5117**	**10623**	**38716**	**15644**	**54360**

II. Horticulture Crop

Horticulture emerged as the second most prominent subject area, with 907 training courses offered to 27,517 farmers, including 9,362 farm women (34% participation rate). Among the seven sub-thematic categories, the production of vegetable crops received the highest attentionwith 588 courses drawing a total of 18,735 farmers. Fruit crop cultivation followed closely behind, with 207 courses with 5,531participants. 36training programs were conducted for 970 participants in ornamental plants, 21 for tuber crops,20 for plantation crops, 19 for medicinal and aromatic plantsand 16 for spices.(Table 00).

Table 00 Details of training programme for horticultural crop

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
II. Horticulture													
a) Vegetable Crops													
Enterprise development	08	56	41	97	6	9	15	53	73	126	115	123	238
Export potential vegetables	11	154	29	183	29	10	39	13	65	78	196	104	300
Grading and standardization	14	242	82	324	44	24	68	21	22	43	307	128	435
Integrated nutrient management	73	1097	369	1466	275	205	480	182	191	373	1554	765	2319
Nursery raising	80	978	366	1344	451	303	754	212	203	415	1641	872	2513
Off-season vegetables	70	768	228	996	216	215	431	333	421	754	1317	864	2181
Production of low volume and high value crops	42	519	283	802	142	160	302	64	56	120	725	499	1224
Protective cultivation (Green Houses, Shade Net etc.)	41	556	147	703	184	96	280	134	76	210	874	319	1193
Water management	19	237	102	339	53	28	81	87	87	174	377	217	594
Yield increment	38	637	190	827	176	94	270	87	83	170	900	367	1267
Training and Pruning	5	79	37	116	16	5	21	4	4	8	99	46	145
Skill development	1	7	0	7	24	0	24	0	0	0	31	0	31
Others, if any	186	3087	928	4015	719	870	1589	320	371	691	4126	2169	6295
Total	588	8417	2802	11219	2335	2019	4354	1510	1652	3162	12262	6473	18735
b) Fruits													
Cultivation of Fruit	63	767	214	981	133	152	285	147	186	333	1047	552	1599
Layout and Management of Orchards	58	780	181	961	196	147	343	105	143	248	1081	471	1552
Management of young plants/orchards	25	387	94	481	93	66	159	6	3	9	486	163	649
Micro irrigation systems of orchards	10	183	42	225	27	28	55	28	10	38	238	80	318
Plant propagation techniques	19	139	72	211	66	43	109	97	106	203	302	221	523
Rejuvenation of old orchards	11	135	73	208	28	15	43	21	31	52	184	119	303
Export potential fruits	3	69	4	73	7	2	9	0	0	0	76	6	82
Others, if any	18	257	55	312	74	89	163	10	20	30	341	164	505
Total	207	2717	735	3452	624	542	1166	414	499	913	3755	1776	5531

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
II. Horticulture													
c) Ornamental Plants													
Nursery Management	10	129	52	181	42	23	65	15	13	28	186	88	274
Propagation techniques of Ornamental Plants	09	119	18	137	23	22	45	2	28	30	144	68	212
Export potential of ornamental plants	05	39	1	40	21	12	33	14	22	36	74	35	109
Management of potted plants	06	13	2	15	4	0	4	104	30	134	121	32	153
Others, if any	06	144	18	162	50	10	60	0	0	0	194	28	222
Total	36	444	91	535	140	67	207	135	93	228	719	251	970
d) Plantation crops													
Production and Management technology	11	100	90	190	56	49	105	22	62	84	178	201	379
Processing and value addition	04	74	7	81	38	7	45	4	3	7	116	17	133
Others, if any	05	27	41	68	22	21	43	10	21	31	59	83	142
Total	20	201	138	339	116	77	193	36	86	122	353	301	654
e) Tuber crops													
Production and Management technology	16	239	43	282	83	34	117	21	16	37	343	93	436
Processing and value addition	04	30	45	75	12	7	19	11	0	11	53	52	105
Others, if any	01	25	1	26	3	0	3	0	0	0	28	1	29
Total	21	294	89	383	98	41	139	32	16	48	424	146	570
f) Spices													
Production and Management technology	14	133	86	219	27	30	57	78	106	184	238	222	460
Processing and value addition	02	26	10	36	10	8	18	10	10	20	46	28	74
Total	16	159	96	255	37	38	75	88	116	204	284	250	534
g) Medicinal and Aromatic Plants													
Nursery Management	02	50	2	52	19	6	25	0	0	0	69	8	77
Production and Management technology	11	130	21	151	43	56	99	32	17	49	205	94	299
Post harvest technology and value addition	05	45	21	66	35	6	41	2	13	15	82	40	122
Others, if any	01	0	0	0	0	0	0	2	23	25	2	23	25
Total	19	225	44	269	97	68	165	36	53	89	358	165	523

III. Soil Health and Fertility Management

Soil health and fertility management is an equally significant thematic area, with a total of 608 training courses offered for 19990 farmers. Among these courses, integrated nutrient management took the lead with 154 offerings, followed by production and use of organic inputs (111 courses),soil fertility management (94 courses)and soil and water testing (79). These courses attracted5006, 3825, 3227 and 2437farmer participants, respectively. Other crucial aspects such as micronutrient deficiency in crops, nutrient use efficiency, and soil and water conservation were also covered in the training programs. (Table 00).

Table 00: Details of training programme for soil health and fertility management

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Others			SC			ST					
III. Soil Health and Fertility Management		M	F	T	M	F	T	M	F	T	M	F	T
Integrated Nutrient Management	154	2801	639	3440	447	287	734	426	406	832	3674	1332	5006
Management of Problematic soils	16	209	36	245	42	7	49	77	45	122	328	88	416
Micro nutrient deficiency in crops	35	477	102	579	119	26	145	137	85	222	733	213	946
Nutrient Use Efficiency	29	367	133	500	74	56	130	128	97	225	569	286	855
Production and use of organic inputs	111	2220	375	2595	277	225	502	431	297	728	2928	897	3825
Soil and Water Conservation	43	632	166	798	187	103	290	191	101	292	1010	370	1380
Soil and Water Testing	79	1315	411	1726	227	79	306	253	152	405	1795	642	2437
Soil fertility management	94	1552	532	2084	344	223	567	315	261	576	2211	1016	3227
Others, if any	47	697	185	882	175	118	293	447	276	723	1319	579	1898
Total	**608**	**10270**	**2579**	**12849**	**1892**	**1124**	**3016**	**2405**	**1720**	**4125**	**14567**	**5423**	**19990**

IV. Livestock Production and Management

Livestock production and management emerged as a key and priority area for training, both in terms of course offerings and farmer engagement. The KVK of the Zone offered a total of 443 courses in this subject area, benefiting 13581 farmers, 4906 of them were farm women, accounting for roughly 36.12%. The subject area of disease management offered the highest (123),followed by dairy management (88),poultry management (69) feed management (42)and 22 training programmes for the development of quality animal products. The number of participants in these courses is as follows: 3809 for disease

management, 2537 for dairy management, 2093 for poultry management,1091 for feed management and 633 for the development of high-quality animal products. (Table 00).

Table 00: Details of training programme for livestock production and management

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Others			SC			ST					
IV. Livestock Production and Management		M	F	T	M	F	T	M	F	T	M	F	T
Dairy Management	88	1184	319	1503	313	256	569	248	217	465	1745	792	2537
Disease Management	123	1757	345	2102	564	550	1114	350	243	593	2671	1138	3809
Feed management	42	470	159	629	156	72	228	135	99	234	761	330	1091
Poultry Management	69	544	272	816	297	551	848	180	249	429	1021	1072	2093
Production of quality animal products	22	315	81	396	76	77	153	48	36	84	439	194	633
Piggery Management	28	133	83	216	115	114	229	215	178	393	463	375	838
Rabbit Management	03	0	0	0	0	0	0	71	30	101	71	30	101
Others, if any	68	951	381	1332	344	436	780	209	158	367	1504	975	2479
Total	**443**	**5354**	**1640**	**6994**	**1865**	**2056**	**3921**	**1456**	**1210**	**2666**	**8675**	**4906**	**13581**

V. Home Science/ Women Empowerment

KVK offerthe ideal platform for women's empowerment, which is a top priority in the current scenario. When it came to training offering and involvement in the KVK system, home science and women's empowerment were considered the fifth important domain. 752 courseswere offered to 23230 farmers in the reporting year out of which almost 69% were women (16018) participants. Attendees of the 5715-course focused on household food security by kitchen gardening and nutrition gardening as a means of achieving family food security. With 158 courses and the active engagement of 4631 farm women, value addition was gaining importance as a new source of income generation. (Table 00).

Table 00: Details of training programme for home science/women empowerment

Thematic Area	No. of Courses	No. of Participants							Grand Total				
		Others			SC			ST					
V. Home Science/Women empowerment		M	F	T	M	F	T	M	F	T	M	F	T
Capacity building	16	166	64	230	27	158	185	32	58	90	225	280	505
Design and development of low/minimum cost diet	48	118	511	629	86	303	389	79	195	274	283	1009	1292
Designing and development for high nutrient efficiency diet	33	299	427	726	133	257	390	30	135	165	462	819	1281
Disease management	6	46	7	53	20	51	71	0	0	0	66	58	124
Enterprise development	54	519	791	1310	57	432	489	50	158	208	626	1381	2007
Feed management	02	16	1	17	9	15	24	0	0	0	25	16	41
Gender main streaming through SHGs	08	0	109	109	1	91	92	0	10	10	1	210	211
Household food security by kitchen gardening and nutrition gardening	195	1047	2326	3373	367	1580	1947	85	310	395	1499	4216	5715
Income generation activities for empowerment of rural Women	38	258	596	854	57	156	213	67	91	158	382	843	1225
Location specific drudgery reduction technologies	20	141	295	436	23	193	216	0	3	3	164	491	655
Poultry management	02	20	0	20	30	8	38	0	0	0	50	8	58
Rural crafts	19	27	159	186	78	451	529	24	65	89	129	675	804
Storage loss minimization techniques	20	179	160	339	19	129	148	14	60	74	212	349	561
Value addition	158	1189	1727	2916	381	786	1167	138	410	548	1708	2923	4631
Women and child care	42	106	410	516	47	341	388	50	161	211	203	912	1115
Minimization of nutrient loss in processing	25	232	292	524	32	134	166	3	26	29	267	452	719
Others, if any	66	613	635	1248	297	566	863	0	175	175	910	1376	2286
Total	752	4976	8510	13486	1664	5651	7315	572	1857	2429	7212	16018	23230

VI. Agriculture Engineering

The mechanization of farms has led to a notable surge in the area of agricultural engineering in recent years. 23296 farmers participated in 761 training courses that were held in total. The fact that 28% of these participants were farm women shows how much more involved they are in this sector. A total of 6170 farmers attended 208 courses on the repair and maintenance of agricultural machinery and implements, making it one of the most prominent themtic area. The setup and upkeep of micro-irrigation systems, in which 2604 farmers took part in 95 courses, was another critical area. Furthermore, with 69 courses offered and 1833 farmers in attendance, post-harvest technology was recognized as a significant sub-thematic field.(Table 00).

Table 00 : Details of training programme for agricultural engineering

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Others			SC			ST					
VI.Agril. Engineering		M	F	T	M	F	T	M	F	T	M	F	T
Installation and maintenance of micro irrigation systems	95	1707	253	1960	340	136	476	94	74	168	2141	463	2604
Post Harvest Technology	69	951	334	1285	182	115	297	110	141	251	1243	590	1833
Production of small tools and implements	79	1024	272	1296	307	402	709	113	72	185	1444	746	2190
Repair and maintenance of farm machinery and implements	208	3316	769	4085	834	489	1323	405	357	762	4555	1615	6170
Small scale processing and value addition	40	618	183	801	140	90	230	28	39	67	786	312	1098
Use of Plastics in farming practices	38	572	199	771	174	77	251	102	49	151	848	325	1173
Others, if any	232	4489	1216	5705	886	927	1813	426	284	710	5801	2427	8228
Total	**761**	**12677**	**3226**	**15903**	**2863**	**2236**	**5099**	**1278**	**1016**	**2294**	**16818**	**6478**	**23296**

VII. Plant Protection

Plant protection is a crucial field that has received considerable attention with regards to training programmes and farmers engagement. In collaboration, the KVKs of Bihar and Jharkhand organized a total of 846 courses, which proved beneficial for 28,986 farmers, including 8,418 farm women. The primary focus of these courses was integrated pest management, which accounted for 424courses and attracted 13,502 participants. Integrated disease management followed closely, with 199 courses and 5,910 participants. Additionally, bio-control of pests and diseases was another important area, with 63 courses involving 1,923 participants. These areas received significant emphasis, as evidenced by the substantial number of courses conducted and the active involvement of farmers.(Table 00).

Table :Details of training programme for plant protection

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
VII. Plant Protection		M	F	T	M	F	T	M	F	T	M	F	T
Bio-control of pests and diseases	63	973	297	1270	231	139	370	158	125	283	1362	561	1923
Integrated Disease Management	199	3148	631	3779	610	716	1326	461	344	805	4219	1691	5910
Integrated Pest Management	424	7737	1670	9407	1465	1446	2911	646	538	1184	9848	3654	13502
Production of bio control agents and bio pesticides	31	503	209	712	114	58	172	58	49	107	675	316	991
Others, if any	129	3431	1138	4569	867	859	1726	166	199	365	4464	2196	6660
Total	**846**	**15792**	**3945**	**19737**	**3287**	**3218**	**6505**	**1489**	**1255**	**2744**	**20568**	**8418**	**28986**

VIII. Fisheries

The KVKs organized 194 fishery science courses for 4960 farmers and farmwomen in 2023, focusing on various aspects such as ornamental fish breeding, carp breeding, hatchery management, fish feed preparation, carp fry and fingerling rearing, fish processing, freshwater prawn culture, integrated fish farming, pearl culture, pen culture, composite fish culture and fish disease. Out of 194 trainings, 43 courses focused on composite fish culture and fish disease (889),32 on integrated fish farming 845, 24Carp fry and fingerling rearing524, 21 on fish feed preparation and its application to fish ponds (573), and 15 on carp breeding and hatchery management (386). (Table00).

Table 00 :Details of training programme for fisheries

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
VIII.Fisheries		M	F	T	M	F	T	M	F	T	M	F	T
Composite fish culture & fish disease	43	588	119	707	68	32	100	43	39	82	699	190	889
Fish feed preparation & its application to fish pond, like nursery, rearing & stocking pond	21	371	74	445	48	11	59	43	26	69	462	111	573
Fish processing and value addition	6	53	63	116	5	3	8	0	14	14	58	80	138
Integrated fish farming	32	559	80	639	93	63	156	27	23	50	679	166	845
Others, if any	29	573	149	722	163	75	238	12	1	13	748	225	973
Carp fry and fingerling rearing	24	326	73	399	58	17	75	34	16	50	418	106	524
Carp breeding and hatchery management	15	251	72	323	34	22	56	7	0	7	292	94	386
Hatchery management and culture of freshwater prawn	12	170	41	211	40	41	81	20	22	42	230	104	334
Breeding and culture of ornamental fishes	6	110	40	150	14	0	14	1	0	1	125	40	165
Portable plastic carp hatchery	3	56	0	56	11	0	11	1	0	1	68	0	68
Pen culture of fish and prawn	2	46	2	48	2	0	2	0	0	0	48	2	50
Pearl culture	1	15	0	15	0	0	0	0	0	0	15	0	15
Total	**194**	**3118**	**713**	**3831**	**536**	**264**	**800**	**188**	**141**	**329**	**3842**	**1118**	**4960**

IX. Production of input at sites

Under the theme of "production of inputs at site," the KVKs of Zone IV offered 92 courses among 2861 individuals. These courses included vermicompost production (21 courses) with 666 participants, production of Bee-coloniesand wax sheets (20 courses) with 530 participants, seed production (11 courses) with 375 participants, organic manures production (09 courses) with 250 participants, planting material production (05 courses) with 155 participants, Small tools and implements (5 courses) with 155 participants , bio-pesticides production (04 courses) with 113 participants, production of livestock feed and fodder (03 courses) with 80 participants(Table 00).

Table 00: Details of training programme for production of input at sites

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
IX. Production of Input at Sites		M	F	T	M	F	T	M	F	T	M	F	T
Production of Bee-colonies and wax sheets	20	36	70	106	25	22	47	149	228	377	210	320	530
Seed production	11	121	47	168	31	7	38	83	86	169	235	140	375
Vermi-compost production	21	260	182	442	42	64	106	55	63	118	357	309	666
Organic manures production	09	128	40	168	26	18	44	25	13	38	179	71	250
Planting material production	05	61	21	82	19	22	41	21	11	32	101	54	155
Small tools and implements	05	45	9	54	9	0	9	53	39	92	107	48	155
Production of livestock feed and fodder	03	39	20	59	19	2	21	0	0	0	58	22	80
Bio-pesticides production	04	69	12	81	23	9	32	0	0	0	92	21	113
Production of Fish feed	01	13	0	13	9	0	9	0	0	0	22	0	22
Others, if any	13	101	30	131	22	22	44	139	201	340	262	253	515
Total	**92**	**873**	**431**	**1304**	**225**	**166**	**391**	**525**	**641**	**1166**	**1623**	**1238**	**2861**

Table 00: Details of training programme for capacity building programme and group dynamics

X. Capacity Building Programme and Group Dynamics

Together, the KVKs of Jharkhand and Bihar held 220 training courses that primarily addressed the group dynamics and capacity building, involving6181 farmers and farmwomen. These training covered a wide range of important topics, such as creating and running self-help groups (SHGs) (47), groupdynamics (36 sessions), developing leadership skills (26), and Entrepreneurial development of farmers/youths(25). The following participation figures were recorded: 1338 farmers took part in SHG classes, 986 group dynamics,747 people leadership development, 735 people Entrepreneurial development of farmers/youths, and 661 farmers actively worked on social capital mobilization (Table 00).

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
X. Capacity Building Programme and Group Dynamics		M	F	T	M	F	T	M	F	T	M	F	T
Formation and Management of SHGs	47	706	149	855	90	152	242	83	158	241	879	459	1338
Leadership development	26	280	167	447	83	59	142	93	65	158	456	291	747
Mobilization of social capital	24	274	66	340	73	94	167	79	75	154	426	235	661
Others, if any	55	762	237	999	290	189	479	39	11	50	1091	437	1528
Group dynamics	36	346	234	580	80	110	190	122	94	216	548	438	986
Entrepreneurial development of farmers/youths	25	255	144	399	114	41	155	104	77	181	473	262	735
WTO and IPR issues	07	79	55	134	16	6	22	20	10	30	115	71	186
Total	220	2702	1052	3754	746	651	1397	540	490	1030	3988	2193	6181

XI. Agro-Forestry

The KVKs also organized 10 courses on agro-forestry covering integrated farming system 243by involving139 male and 104 farm women, respectively etc(Table 00).

Table 00:Details of training programme for agro-forestry

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
XI.AgroForestry System		M	F	T	M	F	T	M	F	T	M	F	T
Integrated Farming Systems	10	57	63	120	15	6	21	67	35	102	139	104	243
Nursery Management	5	30	34	64	0	0	0	37	43	80	67	77	144
Production technologies	5	54	19	73	18	7	25	37	17	54	109	43	152
Total	20	141	116	257	33	13	46	141	95	236	315	224	539
Grand Total	6375	96153	33361	129514	21975	21604	43579	16351	16057	32408	134479	71022	205501

B. Training Programme for Rural Youth

In 2022, the KVKs of Zone-IV undertook a systematic approach to provide skill-oriented training for rural youth, aiming to generate self-employment opportunities. These enterprise-oriented training programs were meticulously organized, benefitting a large number of rural youths. A total of 1228 training programs were conducted, catering the needs of 34243 rural youth, comprising 21939 boys and 12304 girls. Among the participants, 22% belonged to the Schedule Caste category, while 20% were from the Schedule Tribe communities. Among the courses offered, mushroom production was the most sought-after, attracting 4503 trainees, seed production with 2927 trainees is rank second, followed by Integrated farming with 2434 participants and Repair and maintenance of farm machinery and implements for 2247 others. These courses were designed to equip rural youth with the necessary skills and expertise for self-employment, empowering them to contribute to the economic growth and development for their communities. Table 00.

Table 00:State-wise details of training programme for rural youth

State	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
Bihar	802	12162	3814	15976	3170	2965	6135	583	466	1049	15915	7245	23160
Jharkhand	426	2442	1553	3995	766	682	1448	2816	2824	5640	6024	5059	11083
Total	**1228**	**14604**	**5367**	**19971**	**3936**	**3647**	**7583**	**3399**	**3290**	**6689**	**21939**	**12304**	**34243**

Table 00: Thematic area wise details of training programme for rural youth

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
Bee-keeping	55	545	218	763	228	276	504	137	93	230	910	587	1497
Cold water fisheries	1	5	10	15	5	5	10	5	2	7	15	17	32
Commercial fruit production	12	107	66	173	14	5	19	35	90	125	156	161	317
Composite fish culture	9	183	24	207	28	13	41	38	26	64	249	63	312
Dairying	49	743	150	893	237	74	311	156	27	183	1136	251	1387
Enterprise development	51	626	340	966	126	261	387	40	24	64	792	625	1417
Fish harvest and processing technology	3	53	11	64	1	4	5	0	0	0	54	15	69
Freshwater prawn culture	1	23	3	26	1	0	1	1	0	1	25	3	28
Fry and fingerling rearing	9	131	26	157	36	6	42	20	26	46	187	58	245
Integrated farming	89	1006	278	1284	360	143	503	313	334	647	1679	755	2434
Mushroom Production	159	1591	1047	2638	504	571	1075	166	624	790	2261	2242	4503
Nursery Management of Horticulture crops	53	677	184	861	212	144	356	143	160	303	1032	488	1520
Ornamental fisheries	6	100	32	132	20	9	29	0	0	0	120	41	161
Para extension workers	4	73	11	84	25	6	31	0	3	3	98	20	118
Para vets	10	186	40	226	16	1	17	37	25	62	239	66	305
Piggery	14	63	29	92	27	15	42	129	148	277	219	192	411
Planting material production	27	241	81	322	100	58	158	134	66	200	475	205	680
Post-Harvest Technology	16	143	84	227	50	59	109	50	73	123	243	216	459
Poultry production	37	437	95	532	72	81	153	111	76	187	620	252	872
Production of organic inputs	63	960	215	1175	221	126	347	251	86	337	1432	427	1859
Production of quality animal products	6	25	42	67	1	12	13	45	68	113	71	122	193
Protected cultivation of vegetable crops	67	1045	240	1285	202	208	410	309	243	552	1556	691	2247
Repair and maintenance of farm machinery and implements	65	900	195	1095	238	166	404	137	97	234	1275	458	1733
Rural Crafts	13	75	161	236	22	104	126	12	10	22	109	275	384
Seed production	102	1626	314	1940	414	158	572	238	177	415	2278	649	2927

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
Sheep and goat rearing	62	844	164	1008	317	412	729	149	106	255	1310	682	1992
Small scale processing	10	85	47	132	22	53	75	7	59	66	114	159	273
Tailoring and Stitching	11	36	91	127	9	61	70	0	48	48	45	200	245
Training and pruning of orchards	15	222	20	242	45	7	52	30	11	41	297	38	335
Value addition	70	193	708	901	76	392	468	123	226	349	392	1326	1718
Vermi-culture	55	522	140	662	98	48	146	361	137	498	981	325	1306
Pearl culture	1	15	3	18	0	0	0	0	0	0	15	3	18
Quail farming	2	44	3	47	11	4	15	17	17	34	72	24	96
Rabbit farming	1	37	9	46	2	0	2	2	0	2	41	9	50
Shrimp farming	3	66	11	77	4	0	4	29	0	29	99	11	110
Other if any	77	976	275	1251	192	165	357	174	208	382	1342	648	1990
Grand Total	**1228**	**14604**	**5367**	**19971**	**3936**	**3647**	**7583**	**3399**	**3290**	**6689**	**21939**	**12304**	**34243**

C. Training Programme for Extension Functionaries

The Extension personnel of State Government Departments play a critical role in bringing new technologies to larger agricultural producing areas. It is imperative that these extension workers have up-to-date training on the most recent developments in agricultural sciences, including the livestock sector. A vast array of extension workers, including line department officals, teachers, NGO staff, and other agriculture related workers from Bihar and Jharkhand were taken part in KVKs training programme. The KVKs trained 20319 extension functionaries through a total of 557 training courses covering a wide range of subject areas. 63545 women and 13964 men made up the total participant count. Productivity enhancement in field crops ranks highest with 82v courses, followed by integrated pest management (65 courses), integrated nutrition management (59 courses), care and production and use of organic inputs (43 courses), maintenance of farm machinery and implements (37 courses), production and use of organic inputs (34 courses), protected cultivation technology (33 courses), capacity building for ICT application (16 courses) and value addition (15 courses). Rejuvenating aged, senile orchards, forming and managing Self-Help Groups (SHGs), and value addition were additional significant training themes for extension workers. (Table 00.)

Table 00:State-wise details of training programme for extension functionaries

State	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
Bihar	371	9213	3068	12281	1274	687	1961	138	78	216	10625	3833	14458
Jharkhand	186	1697	1058	2755	437	447	884	1205	1017	2222	3339	2522	5861
Total	**557**	**10910**	**4126**	**15036**	**1711**	**1134**	**2845**	**1343**	**1095**	**2438**	**13964**	**6355**	**20319**

Table 00 Thematic area wise training programme for extension functionaries

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
Capacity building for ICT application	16	136	74	210	42	100	142	34	62	96	212	236	448
Care and maintenance of farm machinery and implements	37	1142	302	1444	142	131	273	22	24	46	1306	457	1763
Formation and Management of SHGs	16	143	164	307	60	51	111	44	61	105	247	276	523
Gender main streaming through SHGs	9	50	64	114	32	31	63	6	37	43	88	132	220
Group Dynamics and farmers organization	21	286	85	371	83	22	105	127	86	213	496	193	689
Household food security	26	165	1027	1192	36	65	101	21	9	30	222	1101	1323
Information networking among farmers	9	168	19	187	32	11	43	18	30	48	218	60	278
Integrated Nutrient management	59	1356	252	1608	149	78	227	277	182	459	1782	512	2294
Integrated Pest Management	65	1240	225	1465	272	63	335	161	84	245	1673	372	2045
Livestock feed and fodder production	16	268	80	348	42	17	59	50	56	106	360	153	513
Low cost and nutrient efficient diet designing	13	92	119	211	8	30	38	23	42	65	123	191	314
Management in farm animals	29	481	85	566	58	51	109	45	31	76	584	167	751
Other if any	53	1480	342	1822	200	106	306	59	85	144	1739	533	2272
Production and use of organic inputs	34	590	185	775	68	65	133	76	38	114	734	288	1022
Productivity enhancement in field crops	82	2193	511	2704	248	136	384	275	112	387	2716	759	3475

Thematic Area	No. of Courses	No. of Participants									Grand Total		
		Other			SC			ST					
		M	F	T	M	F	T	M	F	T	M	F	T
Productivity enhancement in field crops	82	2193	511	2704	248	136	384	275	112	387	2716	759	3475
Protected cultivation technology	33	561	206	767	140	57	197	58	66	124	759	329	1088
Rejuvenation of old orchards	13	397	75	472	51	15	66	13	7	20	461	97	558
Value addition	15	80	153	233	27	57	84	14	60	74	121	270	391
Women and Child care	10	67	153	220	16	46	62	15	23	38	98	222	320
WTO and IPR issues	1	15	5	20	5	2	7	5	0	5	25	7	32
Total	557	10910	4126	15036	1711	1134	2845	1343	1095	2438	13964	6355	20319

D. Sponsored Training Programme

The KVKs of ATARI Zone-IV provide crucial support, educate farmers, and foster collaboration with agricultural development organizations. They use HRD programs to assist agricultural development and farmers. The government and organizations have frequently contacted KVKs to offer training on various topics such as crop production and management, post-harvest technology and value addition, livestock production, home science and agricultural extension. The KVKs, on the other hand, have tried to meet these organization' expectations in addition to finishing the necessary responsibilities. KVKs were crop production (836), which involved 43297 participants, post-harvest technology and value addition (197) which involve 7238 participants and livestock production (170), which involved 5724 participants. The other two primary training sectors were home science (122) courses with 3785 participants and agricultural extension (90) courses with 3407 participants (Table). Attendance trends revealed that sponsors preferred to train their clients in areas where participants might start their own enterprises and become independent.

Table 00: State wise details of sponsored training programme

State	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Bihar	1068	32291	6821	39112	5615	4278	9893	778	936	1714	38684	12035	50719
Jharkhand	396	3402	2587	5989	1380	1262	2642	2520	3216	5736	7302	7065	14367
Total	**1464**	**35693**	**9408**	**45101**	**6995**	**5540**	**12535**	**3298**	**4152**	**7450**	**45986**	**19100**	**65086**

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Crop production and management													
Commercial production of vegetables	122	6095	614	6709	400	376	776	412	265	677	6907	1255	8162
Fruit Plants	43	532	298	830	308	311	619	86	109	195	926	718	1644
Increasing production and productivity of crops	406	13422	2537	15959	2941	1444	4385	879	1076	1955	17242	5057	22299
Methods of protective cultivation	31	596	180	776	103	44	147	82	167	249	781	391	1172
Ornamental plants	15	152	64	216	27	5	32	34	12	46	213	81	294
Other (Integrated pest management)	81	1722	353	2075	382	214	596	189	297	486	2293	864	3157
Production and value addition	37	559	87	646	162	96	258	95	172	267	816	355	1171
Production of Inputs at site	16	315	42	357	35	59	94	37	6	43	387	107	494
Soil health and fertility management	71	1918	746	2664	306	173	479	347	320	667	2571	1239	3810
Spices crops	14	612	157	769	152	63	215	57	53	110	821	273	1094
Total	**836**	**25923**	**5078**	**31001**	**4816**	**2785**	**7601**	**2218**	**2477**	**4695**	**32957**	**10340**	**43297**
Post harvest technology and value addition													
Processing and value addition	29	270	347	617	79	194	273	27	80	107	376	621	997
Other	20	348	97	445	88	84	172	21	0	21	457	181	638
Total	49	618	444	1062	167	278	445	48	80	128	833	802	1635
Farm machinery													
Farm machinery, tools and implements	125	2394	655	3049	600	386	986	256	282	538	3250	1323	4573
Other (Repair & maintenance of farm implement)	72	1629	395	2024	328	187	515	61	65	126	2018	647	2665
Total	**197**	**4023**	**1050**	**5073**	928	**573**	**1501**	**317**	**347**	**664**	**5268**	**1970**	**7238**
Livestock Production													
Animal Disease Management	29	507	101	608	38	79	117	23	82	105	568	262	830
Animal Nutrition Management	21	261	136	397	106	98	204	126	84	210	493	318	811
Fisheries Management	19	361	112	473	46	89	135	49	38	87	456	239	695
Fisheries Nutrition	18	314	77	391	22	26	48	6	0	6	342	103	445

Area of training	No. of Courses	No. of Participants											
		General			SC			ST			Grand Total		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
Livestock production and management	43	580	294	874	318	346	664	114	104	218	1012	744	1756
Other	40	537	150	687	168	161	329	72	99	171	777	410	1187
Total	**170**	**2560**	**870**	**3430**	**698**	**799**	**1497**	**390**	**407**	**797**	**3648**	**2076**	**5724**
Home Science													
Drudgery reduction of women	28	139	242	381	28	225	253	16	59	75	183	526	709
Economic empowerment of women	15	293	166	459	13	20	33	10	29	39	316	215	531
Household nutritional security	42	517	350	867	52	211	263	1	121	122	570	682	1252
Other	37	226	533	759	42	351	393	7	134	141	275	1018	1293
Total	**122**	**1175**	**1291**	**2466**	**135**	**807**	**942**	**34**	**343**	**377**	**1344**	**2441**	**3785**
Agricultural Extension													
Capacity Building and Group Dynamics	54	1148	376	1524	165	177	342	138	153	291	1451	706	2157
Other	36	246	299	545	86	121	207	153	345	498	485	765	1250
Total	90	1394	675	2069	251	298	549	291	498	789	1936	1471	3407
Grand Total	**1464**	**35693**	**9408**	**45101**	**6995**	**5540**	**12535**	**3298**	**4152**	**7450**	**45986**	**19100**	**65086**

E. Vocational Training Programme

In 2023, Zone IV organized 407 vocational training programs to address unemployment in the rural areas. The goal was to provide participants with the necessary skills to improve their job prospects. 11568 people participated in these programs, aiming to reduce unemployment and promote economic growth. The KVKs identified viable areas for skill development, including mushroom cultivation, goat farming, entrepreneurial development, dairy management, vegetable cultivation, value addition and commercial for sustainable livelihoods. The KVKs collaborated with banks and credit unions to provide seed, money to the trainees, reducing their concerns about business development. This strategy not only addressed unemployment but also promoted self-reliance and entrepreneurship among participants.

Table 00: State wise details of vocational training programme

State	No. of Training	Grand Total		
		Male	Female	Total
Bihar	243	4743	2674	7417
Jharkhand	164	2634	1517	4151
Total	**407**	**7377**	**4191**	**11568**

Table00 :Thematic area wise details of vocational training programme

Area of training	No. of Training	Grand Total		
		M	F	Total
Beekeeping	18	320	209	529
Commercial Fruit Production	31	480	326	806
Dairy Management	23	633	177	810
Entrepreneurship Development	28	464	303	767

Area of training	No. of Training	Grand Total		
		M	F	Total
Farm Mechanization	21	399	162	561
Fish Production	10	227	77	304
Goat farming	41	1030	312	1342
Income generation	10	141	120	261
Integrated farming system	12	210	115	325
Integrated Nutrient management	9	276	43	319
Mushroom Production	70	1042	709	1751
Organic Farming	6	105	63	168
Poultry farming	17	332	131	463
Production of Organic Input	14	264	81	345
Protected cultivation	9	179	125	304
Seed Production	12	216	162	378
Soil & water testing	14	323	28	351
Tailoring and Stitching	11	1	255	256
Value addition	18	149	385	534
Vegetable cultivation	19	318	267	585
Vermicompost production	14	268	141	409
Grand Total	**407**	**7377**	**4191**	**11568**

Extension Programme

Under Zone IV KVKs conducted 141638 number of diverse extension activities with the aim of raising awareness among farmers about the advantage of modern and recent agriculture & allied technologies. These activities covered various aspect such scientific based scientific visit to farmers field (6610) farmers visit to KVK (64255), advisory services (53001), diagnostic visit (3398) and animal health camp (73). The primary objective was to reach out to a total of 1950775 farmers and extension official whereas 281116 SC and 345240 ST candidate participated in the extension activities (Table 00).

Table 00: State wise details of Extension Programme

Name of State	No. of activities	Farmers					Extension Officials					Total				
		M	F	Total	SC (no.)	ST (no.)	M	F	Total	SC (no.)	ST (no.)	M	F	Total	SC (no.)	ST (no.)
Bihar	120285	986643	294097	1280740	208880	30153	22053	8011	30064	5753	13318	1008696	302108	1310804	214633	43471
Jharkhand	21353	351361	276988	628349	63890	292405	7572	4050	11622	2593	9364	358933	281038	639971	66483	301769
Total	141638	1338004	571085	1909089	272770	322558	29625	12061	41686	8346	22682	1367629	583146	1950775	281116	345240

Table00 :Details of various extension activities organized

Nature of Extension Activity	No. of activities	Farmers					Extension Officials					Total				
		M	F	Total	SC (no.)	ST (no.)	M	F	Total	SC (no.)	ST (no.)	M	F	Total	SC (no.)	ST (no.)
Advisory Services	53001	386537	170135	556672	84319	111967	4205	1877	6082	718	2860	390742	172012	562754	85037	114827
Animal Health Camp	73	4612	1592	6204	1457	895	167	94	261	41	101	4779	1686	6465	1498	996

Nature of Extension Activity	No. of activities	Farmers					Extension Officials					Total				
		M	F	Total	SC (no.)	ST (no.)	M	F	Total	SC (no.)	ST (no.)	M	F	Total	SC (no.)	ST (no.)
Celebration of important date	476	19155	12171	31326	5079	2858	1294	792	2086	824	641	20449	12963	33412	5903	3499
Clinical Service	163	126	44	170	3	139	0	0	0	0	0	126	44	170	3	139
Diagnostic visits	3398	16669	5766	22435	5290	2423	1480	367	1847	348	837	18149	6133	24282	5638	3260
Exhibition organized	73	10486	4344	14830	1432	1127	889	222	1111	239	629	11375	4566	15941	1671	1756
Exposure visits	448	14928	5094	20022	2489	2214	446	151	597	64	341	15374	5245	20619	2553	2555
Ex-trainees Sammelan	46	2093	644	2737	431	326	148	144	292	15	60	2241	788	3029	446	386
Farm Science Club Conveners meet	29	983	449	1432	146	131	36	29	65	36	357	1019	478	1497	182	488
Farmers Seminar	52	4535	1895	6430	1148	301	233	91	324	98	352	4768	1986	6754	1246	653
Farmers visit to KVK	64255	85425	31841	117266	18640	13237	1528	504	2032	1046	4845	86953	32345	119298	19686	18082
Field Day	757	22311	8548	30859	4233	5146	844	286	1130	147	1336	23155	8834	31989	4380	6482
Film Show	606	19310	11772	31082	3077	10507	409	124	533	145	592	19719	11896	31615	3222	11099
Group discussion	478	12738	2696	15434	3066	2364	1299	482	1781	265	514	14037	3178	17215	3331	2878
Kisan Ghosthi	842	50675	29242	79917	16161	5777	1658	561	2219	245	593	52333	29803	82136	16406	6370
Kisan Mela organized	38	27807	13759	41566	4689	11402	1052	353	1405	205	403	28859	14112	42971	4894	11805
Kisan Mela participated	155	88280	42184	130464	16198	10420	2910	1167	4077	414	433	91190	43351	134541	16612	10853
Lectures delivered as resource persons	2586	83512	33059	116571	15156	4685	2590	1405	3995	1170	2462	86102	34464	120566	16326	7147
Mahila Mandals Conveners meetings	67	1148	2030	3178	626	739	82	51	133	83	99	1230	2081	3311	709	838
Method Demonstr-ations	550	10653	3511	14164	1388	1091	406	161	567	131	695	11059	3672	14731	1519	1786
Others	3961	246854	31270	278124	59269	8799	2341	716	3057	313	5	249195	31986	281181	59582	8804
Participation in exhibition	143	25765	9563	35328	5274	1760	446	173	619	102	194	26211	9736	35947	5376	1954
PM live telecast	40	1505	1029	2534	145	675	101	13	114	2	2	1606	1042	2648	147	677
Sankalp Se Siddhi	79	2052	1494	3546	764	769	158	131	289	75	118	2210	1625	3835	839	887

Nature of Extension Activity	No. of activities	Farmers					Extension Officials					Total				
		M	F	Total	SC (no.)	ST (no.)	M	F	Total	SC (no.)	ST (no.)	M	F	Total	SC (no.)	ST (no.)
Scientific visit to farmers field	6610	41590	12157	53747	8160	5731	1858	586	2444	341	1520	43448	12743	56191	8501	7251
Self Help Group Conveners meetings	113	1803	2613	4416	728	709	117	107	224	98	175	1920	2720	4640	826	884
Soil health Camp	98	3164	1260	4424	657	555	184	126	310	61	159	3348	1386	4734	718	714
Soil test campaigns	364	8893	4567	13460	1536	4189	304	175	479	92	551	9197	4742	13939	1628	4740
Special day celebration	351	17054	9564	26618	4199	4540	726	573	1299	640	329	17780	10137	27917	4839	4869
Special Programme	23	419	428	847	98	0	0	12	12	14	0	419	440	859	112	0
Swachhta Hi Sewa	843	25905	9342	35247	2799	2957	757	262	1019	203	542	26662	9604	36266	3002	3499
Viksit Bharat Sankalp Yatra	743	92479	103651	196130	2105	102637	441	144	585	40	206	92920	103795	196715	2145	102843
Workshop	177	8538	3371	11909	2008	1488	516	182	698	131	731	9054	3553	12607	2139	2219
Grand Total	141638	1338004	571085	1909089	272770	322558	29625	12061	41686	8346	22682	1367629	583146	1950775	281116	345240

Others Extension Activities

The KVKs are also involved in the other forms of extension activities such as publication of popular articles, mass media communication through giving radio and TV talks, producing extension material, serving as resource parson for the state agriculture department or ATMA, planning awareness campaigns and more. These kinds of 21641 extension activities were carried out by the KVKs in Zone IV during the year. Bihar KVKs organized 16062whereas Jharkhand organized 5579 extension activitiesthrough different activities such as extension literature, newspaper coverage, different articles, electronic media (Table).

Table :Others extension activities organized

Nature of Extension Activity	No. of Activities		Total
	Bihar	Jharkhand	
Electronic media	313	68	381
Extension Literature	10264	4151	14415
Newspaper coverage	4751	998	5749
Radio talks	105	67	172
TV talks	146	132	278
Research paper	23	0	23
Popular articles published	346	122	468
Books/ Book Chapter	28	0	28
Any other	86	41	127
Grand Total	**16062**	**5579**	**21641**

PRODUCTION OF SEED, PLANTING MATERIALS AND BIO PRODUCTS

Seed produced by KVKs (Farm and Village Seed Production)

Seed production is a critical component of agricultural development, ensuring that farmers have access to high-quality seeds that can lead to increased yields, improved crop performance, and sustainability. By focusing on quality control, capacity building, and strategic partnerships, Zone IV has initiated a program on Farm and Village Seed Production Programmeto maximize seed production in order to meet the demand of quality seeds from farmers and support the livelihoods of farming communities. In 2023, KVKs of Zone IV successfully produced 25211.95 quintals of seeds for major field crops such as cereals, pulses, and oilseeds, as well as horticultural crops including vegetables, flowers, and spices. This achievement has been instrumental in ensuring a steady supply of high-quality seeds to support agricultural activities and meet the needs of farmers.

Table: State-wise details of seed production

Sl. No.	States	Seed Production (q)
1	Bihar	23516.70
2	Jharkhand	1695.25
	Total	25211.95

Crop-wise seed production

In the year 2023, the KVKs of ATARI ZoneIV contributed significantly to the production of seeds for several crops. In total, they produced 11577.21 quintals of cereals, 493.03 quintals of pulses, 294.94 quintals of oilseeds, 11232.99 quintals of vegetables, 106.84 quintals of fruits, 1436.48 quintals of commercial crops, 24.60 quintals of spices, 31.68 quintals of fodder crops, and 14.18 quintals of green manures (Table). The goal of producing these high-quality seeds was to make them easily accessible to farmers of the nearby area. In order to promote agricultural activities and guarantee that farmers have access to high-quality seeds for their farming pursuits, this effort has been extremely important.

Table: Details of crop wise seed production

Crop Type	Name of Crop	Bihar	Jharkhand	Grand Total
		Quantity of Seed (q)		
Cereals	Barley	3	0	3
	Barnyard Millet	0.78	0	0.78
	Buckwheat	0.2	0	0.2
	Cereals	785.9	0	785.9
	Cheena	2.23	0	2.23
	Chickpea	7.8	0	7.8
	Finger Millets	18.4	28.76	47.16
	Green gram	7.45	0	7.45
	Jowar	0	1	1
	Kodo	0	0.1	0.1
	Maize	35.16	0	35.16
	Millets	0	12	12
	Paddy	6499.62	1278.81	7778.43
	Pearl Millet	4.02	0	4.02
	Ragi	17.39	1.04	18.43
	Wheat	2770.87	102.68	2873.55
	Sub Total	**10152.82**	**1424.39**	**11577.21**
Commercial crop	Makhana	67.7	0	67.7
	Sugarcane	1288.5	0	1288.5
	Elephant Foot Yam	4	76.28	80.28
	Sub Total	**1360.2**	**76.28**	**1436.48**
Fodder	Azolla	0.3	0	0.3
	Hybrid Napier	25	0	25
	Niger	1.24	5.14	6.38
	Sub Total	26.54	5.14	31.68
Fruits	Aonla	0	6.784	6.784
	Dragon fruits	100	0	100
	Papaya	0	0.06	0.06
	Sub Total	**100**	**6.844**	**106.844**
Green Manure	Dhaincha	0.71	0	0.71
	Green Manure	0	13.44	13.44
	Tephrosia	0	0.03	0.03
	Sub Total	**0.71**	**13.47**	**14.18**
Pulses	Black gram	0.27	2	2.27
	Chickpea	78.16	9.75	87.91
	Green gram	87.01	1	88.01
	Lentil	95.73	0	95.73
	Linseed	1.17	3	4.17
	Pigeon pea	188.24	26.7	214.94
	Sub Total	**450.58**	**42.45**	**493.03**
Spices	Coriander	2.5	0	2.5
	Turmeric	22.1	0	22.1
	Sub Total	**24.6**	**0**	**24.6**
Vegetables	Potato	1141	63.5	1204.5
	Other	10011.15	17.34	10028.49
	Sub Total	**11152.15**	**80.84**	**11232.99**
Oilseeds	Linseed	17.45	2.18	19.63
	Mustard	228.41	43.59	272
	Sesame	3.24	0.07	3.31
	Sub Total	**249.1**	**45.84**	**294.94**
Grand Total		23516.70	1695.25	25211.95

Horticultural planting materials

High-quality horticultural planting materials are essential for successful crop production and the overall development of the horticulture sector. Horticultural planting materials encompass a variety of propagation sources used to grow fruits, vegetables, flowers, and ornamental plants. These materials include seeds, seedlings, cuttings, tubers, bulbs, rhizomes, grafts, and tissue culture plants. The quality of planting materials significantly affects the growth, yield, and health of horticultural crops, making it crucial to use high-quality, disease-free materials. In 2023, KVKs produced a total 36.51 lakh planting materials, with Bihar producing 24.86 lakh and Jharkhand contributing 11.64 lakh. This led to a revenue of Rs. 15.06 million from selling high-quality materials to 47681 beneficiaries in Zone IV (Table). This initiative has significantly contributed to horticulture advancement and provided farmers with valuable resources, enabling them to improve their agricultural activities.

Table: State-wise production of Horticultural Planting Materials by KVKs

Commercial	Bihar			Jharkhand			Total		
	No. of plants	Value (Rs.)	No. of farmers	No. of plants	Value (Rs.)	No. of farmers	No. of plants	Value (Rs.)	No. of farmers
Vegetable seedlings	2183472	1213886	12382	1045934	582149	13303	3229406	1796035	25685
Fruits	191066	11644855	14603	43230	857425	2118	234296	12502280	16721
Ornamental plants	94783	162840	448	1841	95370	490	96624	258210	938
Medicinal & Aromatic	11511	66300	56	73450	255000	4090	84961	321300	4146
Others	4800	7000	40	0	0	0	4800	7000	40
Spices	1045	148700	84	10	35000	67	1055	183700	151
Grand Total	**2486677**	**13243581**	**27613**	**1164465**	**1824944**	**20068**	**3651142**	**15068525**	**47681**

Fruit crops

The production of high-quality planting materials for fruit crops likemango, litchi, guava, lemon and many more is a foundational aspect of successful orchard farming. By employing appropriate propagation techniques, maintaining rigorous quality control, and managing nurseries effectively, producers can ensure that farmers have access to superior planting materials. This not only enhances crop yields and quality but also supports the sustainability and profitability of fruit production. Investing in the production of planting materials is crucial for the growth and development of the horticulture sector. To address the demand for high quality planting material, KVKs in Zone IV propagated 2.34 lakh excellent planting materials for essential fruit crops, with mango saplings ranking highest (116113) followed by papaya (42097). Guava plants were propagated in 33649, with Bihar's share at 78% and Jharkhand's at 22%. Litchi plants were propagated in 18040, with Bihar accounting for 96% of the total. These efforts have significantly contributed to meeting the demand for quality planting materials and supporting fruit crop cultivation.

Table :Details of production of planting materials in fruits crop

Fruit crops	Bihar			Jharkhand			Total		
	No. of plants	Value (Rs.)	No. of farmers	No. of plants	Value (Rs.)	No. of farmers	No. of plants	Value (Rs.)	No. of farmers
Mango	100058	7271265	7431	16055	407700	808	116113	7678965	8239
Papaya	24440	370325	1888	17657	72855	245	42097	443180	2133
Guava	26382	1396100	2438	7267	245280	630	33649	1641380	3068
Litchi	17353	1679200	193	687	46590	120	18040	1725790	313
Lime	13743	767050	2001	990	31200	285	14733	798250	2286
Banana	5356	47760	183	150	3000	30	5506	50760	213
Dragon Fruit	1515	60600	0	0	0	0	1515	60600	0
Pomegranate	829	46255	174	0	0	0	829	46255	174
Pear	0	0	0	400	2000	0	400	2000	0
Jamun	150	0	55	0	0	0	150	0	55
Custard Apple	140	4200	70	0	0	0	140	4200	70
Black Berry	70	2100	70	0	0	0	70	2100	70
Passion Fruits	30	0	0	0	0	0	30	0	0
Aonla	0	0	0	24	48800	0	24	48800	0
Others	1000	0	100	0	0	0	1000	0	100
Grand Total	**191066**	**11644855**	**14603**	**43230**	**857425**	**2118**	**234296**	**12502280**	**16721**

Vegetable crops

Producing high-quality planting materials for vegetable crops is vital for ensuring successful crop establishment, high yields, and disease-free plants. This process involves selecting the right propagation methods, managing nurseries effectively, and adhering to quality control standards. In light of this, Zone IV has focused heavily all year long on producing excellent planting materials for necessary vegetable crops in accordance with their particular seasons. Based on the total planting material 3228806 produced, out of these highest was produced in tomato (945358 seedlings) that was propagated the most, followed by onion, brinjal and chilli with respective quantities of 554093,451381 and 389111seedlings (Table). Remarkably, the Bihar KVKs produced majority of the seedlings from tomatoes contributing the highest amount (710975 seedlings), while Jharkhand KVKs supply remaining 234383 tomato seedlings. With a special emphasis on tomatoes, these committed efforts have been crucial in guaranteeing the supply of premium planting materials for vegetable crops. This project has given farmers in the area the tools they need to successfully cultivate vegetables, considerably enhancing agricultural practices in the area.

Table :Details of production of planting materials in vegetable crops

Vegetable Crops	Bihar			Jharkhand			Total		
	No. of plants	Value (Rs.)	No. of farmers	No. of plants	Value (Rs.)	No. of farmers	No. of plants	Value (Rs.)	No. of farmers
Tomato	710975	326177	2906	234383	116019.75	4547	945358	442196.75	7453
Onion	414093	22640	156	140000	1000	90	554093	23640	246
Brinjal	238373	153345	1670	213008	140813.5	4346	451381	294158.5	6016
Chilli	241671	89513	1586	147440	53283.75	688	389111	142796.75	2274
Cauliflower	245838	197804	2381	140952	64279	1146	386790	262083	3527
Cabbage	121312	108072	1404	120469	59389	942	241781	167461	2346
Others	68318	124945	565	10915	111230	705	79233	236175	1270
Broccoli	15182	27781	178	36767	31134	776	51949	58915	954
Capsicum	37407	40551	259	2000	5000	63	39407	45551	322
French Beans	18800	25100	85	0	0	0	18800	25100	85
Bitter gourd	12729	11290	199	0	0	0	12729	11290	199
Radish	11000	0	110	0	0	0	11000	0	110
Lobia	10000	0	103	0	0	0	10000	0	103
Bottle gourd	7946	29592	161	0	0	0	7946	29592	161
Cucumber	7232	10990	228	0	0	0	7232	10990	228
Cucurbits	6700	20100	42	0	0	0	6700	20100	42
Sponge Gourd	6441	14436	117	0	0	0	6441	14436	117
Spinach	5000	0	103	0	0	0	5000	0	103
Carrot	2500	0	0	0	0	0	2500	0	0
Lettuce	880	4400	0	0	0	0	880	4400	0
Ridge gourd	284	1624	78	0	0	0	284	1624	78
Pumpkin	191	1026	30	0	0	0	191	1026	30
Grand Total	**2182872**	**1209386**	**12361**	**1045934**	**582149**	**13303**	**3228806**	**1791535**	**25664**

Spices, Medicinal and Aromatic crops

Producing high-quality planting materials for spices, medicinal, and aromatic crops is essential for ensuring the successful cultivation of these high-value crops. In light of this, in 2023, the KVKs in Bihar and Jharkhand actively propagated planting materials of various categories, including medicinal and aromatic plants (84961), ornamental plants (96624), and spices (1055) (Table). This highlights the farmers' interest in cultivating these high-value crops, which have local demand and possess bio-aesthetic values, as depicted. In the domain of medicinal and aromatic plants, there was a high demand for lemongrass, Pama Rose, Moringa, Citronella, Aloe vera, and Mentha with quantities of 29000,20000,12641,10000,8320 and 5000 number of seedlings respectively. The KVKs' initiatives have played a pivotal role in promoting these crops and supporting the local agricultural landscape in Bihar and Jharkhand.

Table:Details of production of planting materials in other horticultural crops

Other Horticultural crops	Planting Materials	Bihar			Jharkhand			Total		
		No. of plants	Value (Rs.)	No. of farmers	No. of plants	Value (Rs.)	No. of farmers	No. of plants	Value (Rs.)	No. of farmers
Ornamental plants	Marigold	88230	5340	183	0	0	0	88230	5340	183
	Croton	4000	120000	187	0	0	0	4000	120000	187
	Others	2500	22500	35	1341	93870	490	3841	116370	525
	Arhul	0	0	0	500	1500	0	500	1500	0
	Tuberose	53	15000	43	0	0	0	53	15000	43
Total		**94783**	**162840**	**448**	**1841**	**95370**	**490**	**96624**	**258210**	**938**
Medicinal and Aromatic	Lemon Grass	1000	2100	34	28000	44000	0	29000	46100	34
	Pama Rosa	0	0	0	20000	40000	0	20000	40000	0
	Moringa	5191	56000	0	7450	111000	1480	12641	167000	1480
	Citronella	0	0	0	10000	20000	2610	10000	20000	2610
	Aloevera	320	3200	0	8000	40000	0	8320	43200	0
	Mentha	5000	5000	22	0	0	0	5000	5000	22
Total		**11511**	**66300**	**56**	**73450**	**255000**	**4090**	**84961**	**321300**	**4146**
Spices	Turmeric	745	148200	41	10	35000	67	755	183200	108
	Ajwain	300	500	43	0	0	0	300	500	43
Total		**1045**	**148700**	**84**	**10**	**35000**	**67**	**1055**	**183700**	**151**
Other	Hybrid Napier	2500	2500	10	0	0	0	2500	2500	10
	Sugarcane	2000	0	0	0	0	0	2000	0	0
	Forest species	300	4500	30	0	0	0	300	4500	30
Total		4800	7000	40	0	0	0	4800	7000	40
Grand Total		**112139**	**384840**	**628**	**75301**	**385370**	**4647**	**187440**	**770210**	**5275**

Bio-Products

The production of bio-products encompasses a wide range of industries and applications to agriculture which can contribute significantly to environmental conservation, economic growth, and improved public health. Investing in research, development, and efficient production techniques is crucial for the continued growth and success of the bio-products sector. To support and promote the utilization and production of these products, the KVKs in Zone IV have been proactive in ensuring a steady supply of bio-pesticides, bio-fertilizers, and bio-agents, with bio-pesticides gaining the highest demand. They have produced 5850 kilograms per liter of bio-pesticides, 70024 kilograms per liter of biofertilizers, and 32064.40 kilograms per liter of bioagents, catering to the diverse needs of the farming community (Table). This initiative has not only met demand but also encouraged farmers to adopt environmentally friendly alternatives for sustainable agricultural practices.

Table :State-wise details of bio-product productions

Name of Bio-Products	Bihar			Jharkhand			Total		
	Quantity (Kg. or Litre)	Value (Rs.)	No. of Farmers	Quantity (Kg. or Litre)	Value (Rs.)	No. of Farmers	Quantity (Kg. or Litre)	Value (Rs.)	No. of Farmers
Bio-agents	14435	69479.5	512	17629.4	68447	196	32064.4	137926.5	708
Bio-fertilizers	35525	236748	272	34499	310530	719	70024	547278	991
Bio-fungicide	50	7500	25	9250	137750	244	9300	145250	269
Bio-pesticide	300	11000	105	5550	140250	671	5850	151250	776
Others	59874.8	324113	347	5792.57	330770	1470	65667.37	654883	1817
Grand Total	**110184.8**	**648840.5**	**1261**	**72720.97**	**987747**	**3300**	**182905.77**	**1636588**	**4561**

Livestock Production

Livestock production is crucial for small and marginal farmers in this region, contributing to their livelihoods and income generation. It involves genetic improvement, balanced nutrition, health management, housing, and sustainable practices. Continuous education, technological adoption, and best management practices are essential for sustainable growth. The KVKs have been working to provide farmers with improved breeds and strains of livestock, poultry birds, ducks, piglets, and fingerling spawn. In 2023, the KVKs facilitated the distribution of 53 dairy animals, 83611 poultry birds, 100 piggery animals, and 411445 fish fingerlingsensuring supply tomore than 1600 farmers to a diverse range of high-quality livestock resources, enhancing their animal-based activities and economic prospects (Table).

Table 101: State-wise details of livestock production

Particulars of Livestock	Bihar			Jharkhand			Total		
	Numbers	Value (Rs.)	No. of Farmers	Numbers	Value (Rs.)	No. of Farmers	Numbers	Value (Rs.)	No. of Farmers
Fisheries	411345	495797	272	100	25000	62	411445	520797	334
Dairy animals	51	1342400	9	2	12000	0	53	1354400	9
Poultry	8036	339050	174	75575	4855270	663	83611	5194320	837
Small ruminants	153	389024	20	70	3600	0	223	392624	20
Piggery	28	287810	13	72	220800	8	100	508610	21
Total	**1002528**	**3605440**	**946**	**76243**	**5201737**	**664**	**1078771**	**8807177**	**1610**

Soil and Water Sample Analysis

Soil testing and soil-based fertilizer application are crucial for increasing productivity and doubling farmers' income. KVK scientists in Zone IV have promoted testing before crop cultivation to reduce fertilizer use and manage environmental hazardsThe KVKs in this Zone-IV have tested total 33709 samples constituting 16186 soil,30 water and 1661 plant and others including food and manure in their laboratories(Table). The opportunity of soil and water testing was availed by as many as 32459farmers from 1558 villages. The number of samples being tested by the KVKs is increasing over the years. This indicates that KVKs have been able to encourage farmers to get soil, water and plant samples tested and apply recommended doses of inputs.

Table 00: Soil, water and plant analysis at KVKs

State	Analysis	No. of Samples analyzed	No. of Villages	No. of Farmers benefitted
Bihar	Soil	16186	937	17369
	Plant	1661	42	974
	Food	36	1	36
	Water	30	12	25
	Manures	4	1	1
Total (Bihar)		17917	993	18405
Total (Jharkhand)	Soil	15792	565	14054
Grand Total		**33709**	**1558**	**32459**

Kisan Mobile Advisories

Kisan Mobile Advisory is one of the Information and Communication Technology (ICT) tools for dissemination of requisite and need based agricultural information to the farmers at the right time.Farmers can get information, services, and advisories in English, Hindi, and local languages via SMS regarding weather patterns and agricultural and related sector practices via the mKisan Portal. During the reporting year, a total of 2410647 farmers were benefited from 9244 advisories delivered by 34 KVKs through mKIsan portal(www.mkisan.gov.in). A wide range of topics are covered, including packages of practices, disease outbreak and prevention, storage, fertilizers, seeds, crops, farmers' insurance, farm equipment, and storage and fertilization costs.

Table 151: State wise advisories sent through mKisan portal by KVKs

State	No. of KVKs	No. of Advisories	No. of Beneficiaries
Bihar	24	8810	631455
Jharkhand	10	434	1779192
Grand Total	**34**	**9244**	**2410647**

Scientific Advisory Committee Meeting of KVKs

The KVKs convene the Annual Scientific Advisory Committee (SAC) meeting to go over the day-to-day work in depth and talk about local issues in order to prepare the Action Plan for the following year with input from progressive farmers, NGOs, and other agencies as well as all the line department members. Representatives from ICAR-ATARI Patna, the Host Organization, other nearby ICAR Institutes, SAU, district developmental departments, media personnel, financial institutions, progressive farmers and farm women, and others make up the committee, as per ICAR guidelines. A 36 KVKs in the state of Bihar and 19 KVKs in the state of Jharkhand were organized a cumulative of 55 SAC meeting in 2023 (Table).

Table 00: State wise details of SAC

State	No. of SAC	No of Participants	Total statutory member present (State line dept.)
Bihar	36	1311	470
Jharkhand	19	692	297
Total	55	2003	767

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

The National Innovations in Climate Resilient Agriculture (NICRA) is a network project initiated by the Indian Council of Agricultural Research (ICAR) aimed at increasing the resilience of Indian agriculture to climate change and climate variability. The Technology Demonstration Component (TDC) of NICRA is carried out through Krishi Vigyan Kendras (KVKs) in the country's most climatically vulnerable districts. The objective is to demonstrate existing technologies developed by the National Agriculture Research System (NARS) on farmers' fields, helping to adapt to climate variability and make Indian agriculture more climate resilient. In order to boost the resilience of Indian agriculture against climatic variability and climate change, the NICRA project is actively operating in 11 districts having 25 Villages for 5894.06 ha cultivated area of Bihar and 3 districts having 7 villages for 1577 ha cultivated area of Jharkhand (Table 00).

Table 00:State-wise details of villages adopted under

State	Name of Districts	Name of Villages	No. of Villages	Cultivated area
Bihar	Buxar	Bhitihara,Jamuaon	2	648
	Darbhanga	Chandauna,Jogiara, Muraitha	3	1545.06
	Kishanganj	Khanabadi,Kharsel (Dengabasti)	2	341
	Bhagalpur	Belsira, Bhatuachak -Navtollia	2	133
	lakhisarai	Gaura,Bhanpura, Kaniyari,Surjichak	4	770
	Nalanda	Sherpur,Gokulpur	2	231
	Saharsa	Chandraya,Bareta	2	585
	Sitamarhi	Pipradhi	1	158
	Siwan	Mirjumla, Sankarpur,Mahmadpur	3	240
	Supaul	Kalyanpur,Nonpar	2	596
	West Champaran	Bagahi Baghamberpur,Parsa	2	647
	Total		25	5894.06
Jharkhand	Godda	Garhi,Gauripur	2	499
	Gumla	Nawatoli,Shivrajpur,Sarnatoli	3	548
	Garwah	Tenar,Sangbaria	2	530
	Total		7	1577

NICRA Project

The interventions being implemented are categorized under four modules, i.e. Natural resource Management (NRM), Crop Production, Livestock & Fisheries, Capacity Building and Extension Activities. Under NRM modules different interventions under taken like Green Manuring, Mulching, Summer ploughing, zero tillage, DSR, Rain water Harvesting structure were followed. Under there interventions 428 number of demonstrations in 616.3 ha area was achieved during the reporting period. Under crop modules different crop were grown in the farmers field with different interventions like short duration variety, direct seeded rice, pest and disease management, flood tolerant varieties etc. This intervention conducted through 104demonstrationsin 1373.45 ha area. In case of livestock & fisheries different interventions were taken like animal health camp,

parasitic control in cattle, immunization, fodder production etc. through 33 demonstrations in133.7 ha area including 56917 animals and 50000 fingerlings.

During the year, theunder-capacity building activities, 163 courses were organized forbenefited 5157 farmers, with thematic areas such as Scientific cultivation of different crop, contingency crop Plan, integrated weed management, entrepreneurship development, green manure and management. Also 427 extension activities including exposure visits, field days, kisan gosthi, RAWE student visits, were conducted for 4680 farmers covering various thematic areas, like vaccination, soil health, millet-based recipe contest, Agri-Drone Technology plant health clinics, and pesticide application etc.(Table 00)

Table 00: State wise details of NICRA modules

States	NRM		Crop production		Livestock & Fisheries			Capacity Building		Extension Activities	
	Demo.	Area (ha)	Demo.	Area (ha)	Demo.	Area (ha)	No. of Animals	No of Courses	Farmers	No. of Programs	Farmers
Bihar	350	503.9	63	1126.3	26	132.3	56507 (50000 fingerlings)	130	4250	346	3332
Jharkhand	78	112.4	41	247.15	7	1.4	410	33	907	81	1348
Total	428	616.3	104	1373.45	33	133.7	56917 (50000 fingerlings)	163	5157	427	4680

Attracting and Retaining Youth in Agriculture (ARYA)

The Indian Council of Agricultural Research (ICAR) has launched “ARYA” "*Attracting and Retaining Youth in Agriculture*." to attract the rural youth to agriculture andits allied sector as a viable income-generating source. The focus is to engage rural youth in primary and secondary agriculture activities under this program.Rural youths remain as trainees in different enterprise of their choice such as Bee keeping, Goat farming, Horticulture Nursery, Lac cultivation, Mushroom Production, Pig farming etc. This initiative is implemented through 10 KVKs of ATARI Zone IV [6 KVKs in Bihar (Aurangabad, Bhagalpur, Bhojpur, Vaishali, East Champaran, and West Champaran) 4 KVKs in Jharkhand (Chatra, East Singhbhum, Gumla, and Ranchi)].

In the year 2023, the data reveals that almost 471 entrepreneurial units were established (314 in Bihar and 157 in Jharkhand) in which maximum entrepreneurial units from Poultry Farming in Bihar and maximum entrepreneurial units from Goat Farming in Jharkhand were established. 58 training programs were organized (34 in Bihar and 24 in Jharkhand) in which 1760 rural youth were trained (1030 male and 730 female) and at present 680 entrepreneurial units were found functional. This program has proven to be instrumental in addressing the issue of rural youth migration that was prevalent in Zone IV. By providing alternative livelihood options and empowering rural youth with relevant skills and knowledge, the ARYA

project has brought about a significant transformation in the living conditions of families in the region (Table 00).

Table 00 : State wise details of ARYA project

State	Subject	No. of Entrepreneurial units Established (2023)	No. of Training Programs Organized (2023)	No. of Rural Youth Trained		No. of Youth Established Units		Total Entrepreneurial Units Formed	Total Entrepreneurial Units Functional
				Male	Female	Male	Female		
Bihar	Goat Farming	1	1	5	2	5	2	1	2
	Fisheries	78	6	0	12	0	0	78	37
	Food Processing	1	1	7	3	7	3	1	2
	Horticulture Nursery/Management	4	2	10	0	10	0	83	57
	Mushroom Production	73	9	102	215	61	159	209	199
	Quail Unit	15	2	22	8	22	8	15	10
	Bee keeping/Honey Processing	20	2	45	5	20	0	20	20
	Poultry Farming	115	8	293	37	120	20	145	97
	Banana Fiber Extraction Units & Value addition	7	3	23	37	1	6	5	3
Sub Total		314	34	507	319	246	198	557	427
Jharkhand	Goat Farming	64	5	59	72	36	41	57	57
	Duck Farming	25	3	42	23	10	2	36	24
	Horticulture Nursery/Management	0	0	0	54	25	0	64	52
	Mushroom Production	13	3	95	65	95	65	26	13
	Pig Farming	12	6	117	98	92	57	9	8
	Seed Production	17	3	90	60	90	60	22	17
	Bee keeping/Honey Processing	5	1	13	9	3	0	42	8
	Poultry Farming	0	0	60	25	0	2	43	28
	Lac Cultivation/Processing	21	3	47	5	11	5	49	46
Sub Total		157	24	523	411	362	232	348	253
Grand Total		471	58	1030	730	608	430	905	680

Farmers FIRST Program (FFP)

Farmer FIRST is an adaptive research project which signifies the Farm, Innovations, Resources, Science and Technology (FIRST). The basic concept is that the farmer of a village will be in a centric role for research problem identification, prioritization, conduct of experiments and its management in farmers' field conditions. It emphasizes resource management, climate resilient agriculture, and production management including storage, marketing, supply chains, value chains, innovation systems and mobilization of information systems for focusing on shifting from production to profit. Thus, the initiative was taken by ICAR to move beyond the production and productivity; to privilege the smallholder agriculture; and complex, diverse and risk prone realities of majority of the farmers. In Farmer FIRST four projects, two for ICAR Institutes and two for State Agricultural Universities, were sanctioned under ICAR-ATARI, Patna(Table 00).

Table 00:Details of Institute, Project Title and Budget under FFP

Sl. No.	Name of the Institute	Title of project	Fund sanctioned during 2023-24 (Rs. in lakh)
1.	Bihar Agricultural University, Sabour, Bhagalpur, Bihar	Cross Sectional Livelihood Improvement and Income Enhancement through Agro -Enterprise Diversification	10.30
2.	Birsa Agricultural University, Ranchi	Technology integration for doubling farm income through participatory research and extension approaches in Ranchi district of Jharkhand	8.20
3.	MGIFRI, Motihari, Bihar	Improved livelihood through good practices in agricultural production system	11.30
4.	ICAR -RCER, RC, Ranchi	Enhancing food, nutritional and livelihood security of marginal and small farmers in Jharkhand through need based agricultural technologies	13.16
5.	ICAR -ATARI, Patna		3.75
Total			46.75

Under crop modules different crop were demonstrated in the farmer's field through 875 demonstrations benefiting 757 households. In case of NRM module about 115 demonstration and 1258 demonstration in horticulture module were conducted by covering 180 and 653 households respectively. In case of livestock and poultry module different interventions were through 218 demonstrations including 928 animals benefiting 462 households. Similarly in IFS module 93 demonstration was done with 57 farm families. About 72 extension activities covering 3699 farm families were also conducted during the reporting period.

Table 00: Institute wise details of FFP

FFP Centre	NRM Module		Crop Module		Horticulture Module		Livestock & Poultry			IFS Model		Extension Activities	
	Demo	No Farm Families	Demo	No Farm Families	Demo	No Farm Families	Demo	No Farm Families	No of Animals	Demo	No Farm Families	No. of prog	No of Farmers participated
BAU, Sabour	27	31	65	132	96	165	136	330	928	0	0	31	665
	32	59	108	424	31	128	0	0	0	4	4	18	1838
ICAR - RCER - FSRCH PR	53	80	659	149	864	240	82	132	0	83	6	18	949
BAU Ranchi	3	10	43	52	267	120	0	0	0	6	47	5	247
Total	115	180	875	757	1258	653	218	462	928	93	57	72	3699

Seed Hub

In terms of production, imports, and consumption, India leads the world in pulses. Due to their significant contribution to India's exports, they are a valuable crop category that also provide significant financial rewards for the country. However, in recent years, the area dedicated to pulse cultivation has been steadily decreasing due to non-availability of quality seed at the time of sowing. In light of this, the government has launched many initiatives to increase the nation's output of pulses, providing timely access to sufficient supplies of high-quality seeds and lowering reliance on imports. In response to this issue, on June 15, 2016, the Ministry of Agriculture and Farmers Welfare launched the "Creation of Seed Hub for increasing indigenous production of pulses in India," a Centrally Sponsored Scheme under the National Food Security Mission (NFSM).To meet the increased demand for high-quality seed from farmers, 10 KVKs in zone IV, seven KVKs in Bihar, and three KVKs in Jharkhand are producing high-quality pulse seed.

Under the seed hub plan in the zone, 6483.95 q of foundation and certified seed of pulses were produced in total during 2023–2024. Notified Pulse varieties not older than 10 years, green gram (IPM-02-3, Shikha, Varsha, Virat), chick pea (GNG-2207, GNG-2299, RVG-202, RVG-204, Sabour Chana-1), Lentil (IPL-220, IPL-316, L-4717) and Pigeon pea (IPA-203, Rajendra Arhar-1) seeds were produced in Bihar in an amount of 4357.95 q, whilst Jharkhand produced the remainder 2126 q of black gram (Birsa Urd-2, IPU-2-11, IPU-2-43, WBU-109), green gram (GM-06, Shikha), chick pea (JG-12), Lentil (IPL-221, IPL-316, IPL-321) and pigeon pea (IPA-15-2, IPA-203). During the late kharif and rabi seasons, the class of seed comprises foundation seed and certified seed.Under ICAR-ATARI, Patna, 10 KVKs—Bojpur, Buxar, East Champaran-I, Lakhisarai, Munger, Saran, Vaishali, Bokaro, Dumka, and East Singhbhum—established Seed Hubs that were operational from 2016-2017. A thorough examination of the seed hub project revealed that, among all KVK's, Dumka KVK had the highest production (1380 q), followed by Lakhisarai KVK (1100 q) while Bokaro KVK had the least production (70 q). Data also showed that, 6483.95 q pulse seed were produced by Seed Hub KVKs of which highest quantity produced was Lentil (2603.59 q) followed by chickpea (1629 q), greengram (1135.17 q), pigeon pea (800 q) and black gram (316 q).

Table: Crop wise details Performance of Seed Hub

Crop	Varieties	Seed target (q)	Area (ha)	Seed Production Crop wise (q)	Category(F/S ,C/S,T/L)
Black Gram	Birsa Urd -2, IPU -2-11, IPU -2-43, WBU -109	1367	77.00	316.00	F/S, C/S
Chickpea	GNG -2207, GNG -2299, JG -12, RVG -202, RVG-204, Sabour Chana -1	2250	145.70	1629.00	F/S, C/S
Green Gram	IPM -02-3, Shikha, Varsha, Virat	1442	137.50	1135.17	F/S, C/S
Lentil	HUL -57, IPL -220, IPL -221, IPL -316, IPL -321, IPL -526, L -4717	4400	292.50	2603.59	F/S, C/S, T/L
Pigeon pea	IPA -15 -2, IPA -203, Rajendra Arhar -1	1125	61.50	800.19	F/S, C/S, T/L
TOTAL		10584	714.20	6483.95	

Table 00: Seed produced and revolving fund status

State	KVK Name	Seed Production (q)	Revolving Fund status (Lakh)
Bihar	Bhojpur	1047.75	105.24
	Buxar	437.00	99.69
	East Champran-I	598.20	99.76
	Lakhisarai	1100.00	89.63
	Munger	530.00	116.98
	Saran	485.00	101.76
	Vaishaili	160.00	32.28
Jharkhand	Bokaro	70.00	113.05
	Dumka	1380.00	147.97
	East Singhbhum	676.00	68.63
TOTAL		6483.95	974.99

District Agro Meteorology Unit (DAMU)

The Agromet Advisory Service, provide by the India Meteorological Department (IMD), Government of India, is committed to delivering weather-informed strategies and operations to optimize crop and livestock management, with the overreaching goal of boosting crop production and securing food resources. This programme was funded for functioning under Gramin Krishi Mausam Sewa (GKMS) of project Atmospheric & Climate Research Modeling Observing & service (ACROSS) scheme of IMD, New Delhi. This year, IMD is partnering with the ICAR to introduce block-level Agromet Advisory Services through KVK under the GKMS initiative, with the aim of broadening the reach of agromet information at the grassroots level. This collaborative effort has a dual focus: crafting Agromet Advisory Bulletins for farmers and stakeholders, providing guidance on weather-sensitive agricultural activities to mitigate weather-related risks, and delivering training to farmers on climate change and potential mitigation measures.

In 2023, a total of 17 centers, comprising 12 in Bihar and 05 in Jharkhand, effectively implemented block-level Agromet Advisory Services, disseminating crucial information to farmers in their respective districts. Over the course in 2023 a cumulative count of 1609 advisory bulletins were distributed covering 463 blocks across Bihar and Jharkhand, benefiting a substantial population of 523959 farmers. Furthermore, a series of 1186 Farmers Awareness Programs (FAP) were organized to enlighten farmers about the invaluable advantages of the Gramin Krishi Mausam Sewa initiative (Table 00).

Table 00 : Details of activities under Agromet Advisories Services

Sl. No.	State	No. of KVK	No. of Block Agromet Advisories	No. of Advisory Bulletin	No. of FAP Organized	No. of Farmers Feedback Received	No. of farmers Received Agro met Advisory Bulletin	No. of Publication
1.	Bihar	12	325	1035	1041	8875	406040	9
2.	Jharkhand	5	138	574	145	2116	117919	6
Grand Total		17	463	1609	1186	10991	523959	15

Cereal System Initiative in South Asia (CSISA)

ICAR collaboration with CSISA of CIMMYT has implemented this project to increase the staple crops yields and incomes of millions of farms families through wide spread adoption of efficient and productive agronomic practices. This includes cultivation of high yielding and stress tolerant cereal cultivaracrossecologies.Under Zone IV, 10 KVKs (Begusarai, Bhojpur, Lakhisarai, Buxuar, East Champaran, Rohtas, Madhepura, Nalanda, Samastipur-I and Muzafferpur-I) in Bihar and 04 KVKs (Gumla, Ranchi, Sahibganj, Dumka) in Jharkhand conducted demonstrated technologies related to DSR, zero tillage, puddled transplanted rice, transplantation and line sowing during the year. The detail of the same is given below in the Table 00.

Table 00: Season wise details of CSISA

Season	Name of Crop	No. of KVK Involved	Total Area Covered (ha)	Avg. Grain Yield (q/ha)	Avg. Cost of Cultivation (Rs/ha)	Avg. Gross Return (Rs/ha)	Avg. Net Return (Rs/ha)	Avg. BCR
Kharif	Paddy	8	338.30	56.19	42,242.02	1,23,629.22	81,387.20	2.93
Rabi	Wheat	8	375.06	40.63	36,102.26	83,801.35	47,699.09	2.32

Table 00: Crops and KVKs wise details of CSISA project

Name of Crops	Name of KVKs	Total Area covered (ha)	Avg. Grain Yield (q/ha)	Avg. Cost of Cultivation (Rs/ha)	Avg. Gross Return (Rs/ha)	Avg. Net Return (Rs/ha)	Avg. BCR
Paddy	Begusarai	50.00	44.99	34,962.00	98,204.44	63,242.44	2.81
	Bhojpur	74.00	61.48	43,609.44	1,10,666.00	67,056.56	2.54
	Buxar	5.00	62.95	46,016.36	1,37,451.96	91,435.60	2.99
	East Champaran	80.00	46.38	39,579.50	1,05,836.88	66,257.38	2.67
	Lakhisarai	23.30	38.00	27,950.00	76,800.00	48,850.00	2.75
	Madhepura	40.00	51.70	44,675.00	1,13,895.10	69,220.10	2.55
	Muzaffarpur	8.00	45.56	36,577.05	1,00,924.13	64,347.08	2.76
	Rohtas	58.00	57.80	41,840.12	1,53,652.97	1,11,812.86	3.67
Wheat	Begusarai	150.00	39.79	32,576.67	78,723.03	46,146.36	2.42
	Bhojpur	54.00	41.49	36,400.00	82,971.43	46,571.43	2.28
	Buxar	33.00	44.97	41,761.11	95,564.00	53,802.89	2.29
	East Champaran	30.00	47.84	33,890.00	1,10,249.37	76,359.37	3.25
	Lakhisarai	10.00	23.00	36,450.00	54,650.00	18,200.00	1.50
	Madhepura	40.00	48.00	35,140.00	1,02,000.00	66,860.00	2.90
	Muzaffarpur	19.00	46.72	34,089.47	94,144.29	60,054.81	2.76
	Rohtas	39.06	35.67	37,419.94	75,800.81	38,380.88	2.03

Nutri-Sensitive Agricultural Resources and Innovation (NARI) project

The Nutri-Sensitive Agricultural Resources and Innovations (NARI) Programme is an initiative by the ICAR to improve the food system's ability to produce nutritious outcomes. The program aims to eradicate malnutrition by focusing on food fortification, dietary diversity, and nutritious food. It also includes safe storage, processing, packaging, transportation, and marketing. The initiative is to grow food what we want to eat. The focus of these programmes to address malnutrition and micronutrient deficiencies in rural areas, promotion of nutritionally enriched foods, mapping of the entire food system of village and suggesting what they should eat.

Under this project, 39 KVKs conducted various activities in 165 Nutri-smart villages for improving the nutrition literacy and nutritional security among the women and young girls. During the year KVKs conducted 09 OFTs and 679 FLD on various technologies on nutrition-based interventions. Along with this 220-training programme benefitting 6819 farm women and 174 extension programmes for 6064 beneficiaries were also organized (Table 00).

Table: 00Details of Nutri-Sensitive Agricultural Resources and Innovation (NARI) project

Sl. No.	States	No. of KVK Involved	No. of Nutri Smart Village Developed	Area (ha)	No of OFT organized	No. of FLD organized	No. of training/ Capacity Development Programme	No. of farmers/ beneficiaries	No. of Extension Programmes	No. of Farmers/ Beneficiaries
1	Bihar	27	120	12 .96	3	504	163	5067	129	4338
2	Jharkhand	12	45	54.62	6	175	57	1752	45	1726
Grand Total		39	165	67.58	9	679	220	6819	174	6064

Out-scaling of Natural Farming through KVKs

Natural farming project was launched by Government of India in the year 2022. Natural Farming (NF) is one such low-input, climate-resilient type of farming that encourages farmers to use low-cost locally-sourced inputs, eliminating the use of artificial fertilizers, and industrial pesticides. Natural Farming (or ZBNF) involves has following four essential components: *Jeevamritha, Beejamritha, Whapsa and Mulching*. It also involves mixed cropping system, home-made preparations for plant protection and seed/planting materials, and mulching. Thus, it envisages complete freedom from chemicals from farming. The KVKs has assigned the activities under these three components through Awareness, Training and Demonstration. In ICAR-ATARI Zone- IV under this project a total 39 KVKs (28 KVKs in Bihar and 11 KVKs in Jharkhand)were selected for this purpose. During the reporting year, total 676 awareness programs with a 121070 total number of participants, 212 training programs with 8173 farmers trained and 468 demonstrations (each having area of 01 acre) were conducted by KVK in farmer's field and KVK farm as mentioned below(Table 00).

Table 00: State wise details of Out Scaling of Natural Farming

State	No. of KVKs involved	No. of Training organized	No. of Farmers participated	No. of Awareness programs	No. of Farmers participated	No. of Demonstrations
Bihar	28	134	5057	433	106508	338
Jharkhand	11	78	3116	243	14562	130
Total	**39**	**212**	**8173**	**676**	**121070**	**468**

Agri-Drone Project

Agri Drone Project under Sub Mission on Agricultural Mechanization for the year 2023. The drone pilot training in Bihar and Jharkhand state. The Un-Crewed / Unmanned Arial Vehicle (UAV) popularly known as “Drone” are increasingly available now for use in various sectors of agriculture for increasing the efficiency in production and reduce the labour burden on farmers. This emerging technology can help to reduce time and increase efficiency in soil and field analysis, crop monitoring and surveillance, crop spraying for pest and disease control, nutrient application, etc. It is being predicted that the agriculture sector will be the second - largest user of drones I the world. Keeping this in view, the agri-drone project has been formulated by ICAR,New Delhi and submitted to the Department of Agriculture &Farmer Welfare, Govt. Of India.

During this year 09 Kisan drones sanctioned for 10 KVKs and 08 drones purchased by the PIC and total area covered under drone was 1244.41 ha through 2586 number of demonstrations. 10 Pilot training wereconducted this year as proposed (Table 00).

Table 00: KVKs wise details of Agri Drone project

SI. No	Name on the project implementation center (PIC)	No. of kisan drones sanctioned	No. of kisan drones purchased by the PIC	Procurement of no of drones in process	Area covered under the kisan drone demonstration (ha)	No. of demonstration conducted	No. of Pilot training proposed	No. of Pilot training conducted
1	KVK-Banka	0	0	0	100	4	0	0
2	KVK-East Champaran	1	1	1	4	14	1	1
3	KVK-Jehanabad	1	1	0	0	0	0	2
4	KVK-Kishanganj	1	1	1	0	0	2	0
5	KVK-Nawada	1	1	0	250	625	2	2
6	KVK-Patna	1	1	0	15	15	0	0
7	KVK-Saharsa	1	1	0	250	389	2	1
8	KVK-Samastipur	1	1	0	60	150	1	1
9	KVK-Gumla	1	1	0	315.41	789	2	2
10	KVK-Jamtara	1	0	1	250	600	0	0
Total		9	8	3	1244.41	2586	10	9

Tribal Sub Plan (TSP)

The TSP initiative was launched for tribal development intended to address the issue of backwardness in tribal area tribal population in an integrated way with aim to minimize the gap between the livelihood of tribal people and other. And the aim of fostering the holistic development of tribal communities, addressing their socioeconomic disparities. Its core objective was to narrow the gap between the livelihoods of tribal populations and other segments of society.This programme is operational under 24 KVKs of Zone IV with total outlay 231 lakh. To uplift the livelihoods and augment the skills of tribal individuals, KVKs in Zone IV undertook a plethora of agricultural and allied sector activities throughout the year. These endeavors encompassed agricultural farming, horticulture, animal husbandry, fish production, and vocational training. The primary beneficiaries of these initiatives were individuals or families belonging to scheduled tribes, with the overarching goal of enhancing their economic well-being. During the year of KVK under this programme 766 training /demonstration for farmers; 168numbers of training /demonstration for women farmers and 282 training programmes for rural youth and 77 training for extensional personals were organized by this zone. In which is 21948,5139,6930,2801 person participated respectively. On farm trial and frontlinedemonstrations were also conducted by some of the KVKs to provide direct interface between researcher and farmers by involving 833 and 5632 farmers respectively.Apart from this 630683 agro-advisory were also send to farmers. Through this programme 1189.41 q of seed of various crops and 5.88513 lakh planting material near about one lakh livestock strains and 10 lakh fingerlings were also providedto the tribal community. Services like 4638 number of soil, water, plant, manures samples were also tested for the farmers(Table 00).

Table 00: Detail activities conducted under TSP

Sl. No.	Name of Activities		Bihar	Jharkhand	Total
1	Farmer Training	No. of Training/Demos	68	698	766
		No. of Farmers	1791	20157	21948
2	Women Farmer Training	No. of Training/Demos	33	135	168
		No. of Women Farmers	933	4206	5139
3	Rural Youths	No. of Training/Demos	23	259	282
		No. of Youths	618	6312	6930
4	Extension Personnel	No. of Training/Demos	11	66	77
		No. of Ext. Person	609	2192	2801
5	Number of farmers involved	On- farm trials	71	762	833
		Frontline demos	761	4871	5632
		Mobile agro - advisory to farmers	13683	617000	630683
6	Participants in extension activities (No.)		3319	139296	142615
7	Production of seed (q)		170.00	1019.41	1189.41
8	Production of Planting material (Number in lakh)		0.31400	5.57113	5.88513
9	Production of Livestock strains (Number in lakh)		0.00000	0.80283	0.80283
10	Production of fingerlings (Number in lakh)		0.00	10.00	10.00
11	Testing of Soil, water, plant, manures samples (Number)		40	4598	4638

Scheduled Caste Sub Plan (SCSP)

The SCSP is a governmental initiative in India aimed at the socioeconomic development of farmers from scheduled caste communities. It focuses on uplifting SC farmers through targeted interventions in various sectors, including agriculture. The goal of this programme is to provide science-based solutions and develop location-specific technologies to help these communities and also aims to ensure that SC receive their fair share of benefits and outlays from the state and central governments, in proportion to their population.

This programme is operational under 52 KVKs of Zone IV with total outlay 233 lakh. During the year of KVK under this programme 320 training /demonstration for farmers; 128 number of training /demonstrations for women farmers and 72 training programmes for rural youth and 03 trainings for extensional personals were organized by this zone. In which is 9683, 3943, 2223, 167 person participated respectively. On farm trial and

frontline demonstrations were also conducted by involving 141and 7618 farmers respectively. Apart from this 113513 agro-advisory send to farmers. Through this programme 54.48 q of seed of various crop and 6.36374 lakh planting material of different crop, 525 livestock strains and 43.82lakh of fingerlings were provided to farmers as critical inputs. 6542 number of samples of soil, water, plant, manures were also tested for the farmers(Table 00).

Table 00: Details of activities conducted under schedule caste sub plan

Sl. No.	Name of Activities		Bihar	Jharkhand	Total
1.	Farmer Training	No. of Training/Demos	242	78	320
		No. of Farmers	7022	2661	9683
2.	Women Farmer Training	No. of Training/Demos	105	23	128
		No. of Women Farmers	3214	729	3943
3.	Rural Youths	No. of Training/Demos	50	22	72
		No. of Youths	1607	616	2223
4.	Extension Personnel	No. of Training/Demos	1	2	3
		No. of Ext. Person	105	62	167
5.	Number of farmers involved	On- farm trials	23	118	141
		Frontline demos	6592	1026	7618
		Mobile agro - advisory to farmers	43609	69904	113513
6.	Participants in extension activities (No.)		5907	1089	6996
7.	Production of seed (q)		28.94	26.00	54.94
8.	Production of Planting material (Number in lakh)		5.55441	0.80933	6.36374
9.	Production of Livestock strains (Number in lakh)		0.00525	0	0.00525
10.	Production of fingerlings (Number in lakh)		43.815	0.00	43.815
11.	Testing of Soil, water, plant, manures samples (Number)		1071	5471	6542
12	Asset creation (Number; Sprayer, ridge maker, pump set, weeder etc.)		36	4705	4741
13	No. of other programmes (Swachha Bharat Abhiyaan, Agriculture knowledge in rural school, Planting material distribution, Vaccination camp etc.)		66	3655	3721

Swachata Action Plan (SAP)

Under the Swachata Action Plan (SAP), *"Evaluation of Vermicomposting Technology for Dairy Waste Management at Household Level"*project was initiated as Institute ProjectThe main objective of the project was to promote vermicomposting technology at household level through suitable technological interventions in Bihar and Jharkhand.In this project total 06 KVKs (03 KVKs in Bihar namely Begusarai, Nawada, Jehanabad and 03 KVKs in Jharkhand namely Ranchi, Godda and Deoghar)were selected for establishment of vermicompostingunits in order to study the sustainability ofthis technology over the farmer's practices. During the reporting year, a new species of earthworm namely Jai Gopal was procured from Indian VeterinaryResearch Institute, Izatnagar to be introduced in the farmer's field. The master training programme for SMS of the concerned KVKs was carried out at IVRI to know the technical know-how of the new technology. Along with this the selection of 20 farmers from each district was done to assess the Knowledge, Attitude and Practices followed by the livestock farmers towards dairy farm waste management (Table 00).

Table 00: Details of SAP Project

State	No. of KVKs	No. of Farmers Selected	No. of Demonstration to be conducted on Farmers Field
Bihar	3	60	60
Jharkhand	3	60	60
Total	6	120	120

Formation and promotion of Farmer Producer Organization (FPO) by KVKs and ICAR institute

An organization that provides services to small farmers is owned and operated by a voluntary group of farmers known as FPO. An FPO's objective is to increase its members' competitiveness and assist them in seizing new market possibilities. 10,000 FPOs were formed under this project by KVKs and the ICAR Institute as Cluster Based Business Organizations (CBBOs). The National Cooperative Development Corporation (NCDC) funded five KVK namely Darbhanga, Vaisali, and Samastipur in Bihar, and Dumka and Gumla in Jharkhand for formation of two FPOs each district. Till date 3249 farmers were registered under Zone IV, which is composed of 10 FPOs managed by five KVKs The details of the same are mentioned below (Table 00):

Table 00: Detail of Farmer Producer Organization (FPO) activities conducted by KVKs

State	Name of KVKs	Name of Block	No. of FPOs	No of Farmers	Status Registration of FPO	Name of FPO
Bihar	Darbhanga	1. Jale 2.Singhwara	2	1. 325 2. 65	Registered District cooperative Darbhanga	1. Jale makhana kisan utpadak sangathan swalambi sahkari samiti limited 2. Singhwara Makka kisan utpadak sangathan swalambi sahkari samiti limited
	Vaishali	1. Bidupur 2.Vaishali	2	1. 400 2. 405	Registered by NCDC, RO Patna	1.Samridhi Farmer Producer Organization Self Supporting Co-operative Society Ltd. 2.Diwan Farmer Producer Organization Self Supporting Co-operative Society Ltd.
	Samastipur-I	1.Morwa 2.Pusa	2	1. 310 2. 160	Registered by NCDC, RO Patna	1. Morwa Jankalyan kisan utpadak sangathan swawlambi sahkari samiti limited 2. Pusa Jankalyan kisan utpadak sangathan swawlambi sahkari samiti limited
Jharkhand	Gumla	1. Gumla 2. Raidih	2	1. 386 2. 304	Registered by Jharkhand Coperative Society	1. Gumla Sabji Utpadak Sahyog Samiti Ltd. 2. Raidih Phal Utpadak Sahyog Samiti Ltd.
	Dumka	1. Kathikund 2. Shikaripara	2	1. 444 2. 450	Registered by Jharkhand Coperative Society	1. Daninath Krishak Utpadak Swawlambi Sahyog Samiti Limited 2. Maluti Krishak Utpadak Swawlambi Sahyog Samiti Limited

New Extension Methodology and Approaches (NEMA)

New Extension Methodologies and Approaches (NEMA) is a network project of the ICAR involving ATARI under guidance of RAC (Research advisory committee) of division of agriculture extension, the entire KVKs network research involve in research activities planned by a network project of ATARI covering various problem/thematic area of their respective zones. Thus, network project is conceived to generate data on adoption of selected improved technologies, the determinants of adoption, constraints and impact from a large pool of samples across the country for generalization and drawing meaningful conclusion(Table 00). The details of Network Project are given below:

Table 00: Details of Network Project implemented by ATARI Zone-IV

S.No	Name of Schemes/Title of Project	Activities	Name of KVKs	PI/CoPI
1	Impact of Climate Resilient Technology Interventions Implemented Through National Innovations in Climate Resilient Agriculture (NICRA) Across Different Agro -Ecological Regions of India	Information on scaling up resilient technologies	Aurangabad, Gumla and East Singhbhum	Dr. Anjani Kumar
2	Assessing Dietary Diversity, Consumption Pattern and Nutritional Security in Nutri-SMART Villages -A Step Towards Vocal for Local	Information of household in NSV and control Village under Gender and Nutrition	Purnea, Khagaria, Nalanda, Vaishali andPatna	Dr. Anjani Kumar
3	Network Project on Impact Assessment of selected Interventions by KVKs under DFI for enhancing Farmers Income	1. Compilation of data of DFI and Non- DFI 2. Impact assessment of selected interventions by KVK under doubling farmers income for enhancing farmers income	Darbhanga, Patna, East Champaran, Godda, Siwan, Bokar, Bhagalpur, Chatra, Katihar, Gumla, Kishanganj, Ranchi, Saharsa, Munger, Bhojpur, Gaya, East Singhbhum, Koderma and Dhanabad	Dr. Amrendra Kumar
4	Impact of Technological Interventions of KVKs on socio-economic empowerment and sustainable livelihood security of Tribal Farmers	4 to 5 number of quality photographs under TSP	Banka, Garhwa,Dumka, Godda, East Singhbhum, Gumla, West Singhbhum and Ranchi	Dr. Anjani Kumar
5.	Network Project on Analysis of Agriculture Programme conducted in Aspirational Districts in India	1. Two best success story/case under aspirational district by each KVKs 2. Aspirational district project survey to validate data already submitted by attached google form	Gaya, Gumla, Nawada,Ranchi, Sitamarhi, Hazaribagh and Godda	Dr. Anjani Kumar
6	Impact of ARYA on promotion of Agri -epreneurship, alternative livelihoods and spin off effect		East Champaran Gumla	Dr. Amrendra Kumar
7	Impact assessment of popular pulses varieties and technologies disseminated by KVKs through cluster frontline demonstration on pulses (CFLD-P) in India	Fund release for data collection of concern KVKs of the country for chickpea and lentil	Patna, Katihar, Nalanda, Supaul, Buxar, Saharsa, Aurangabad, Purnia, Bhojpur and Kishanganj	Dr. Amrendra Kumar

Kisan Sarathi

Kisan Sarathi is an intelligent online digital platform for supporting agriculture at local niche with national perspective. Which is intended to provide a seamless, multimedia, multi-ways connectivity to the farmers with the latest agricultural technologies, knowledge base and the pool of large number the subject matter experts. It is a joint initiative of ICAR & Digital India Corporation (DIC) launched by the Union Ministers for Agriculture and Farmers' Welfare and Electronics & Information Technology to help farmers get the right information at the right time.

During the year 2023, a total 502673 farmers have been registered on the portal by the 43 KVKs of Bihar (425216) and 23 KVKs of Jharkhand (77457) (Table 00).

Table 00: Details of Kisan Sarathi programme by KVKs

State	No of KVKs registered	No. of farmers registered
Bihar	43	425216
Jharkhand	23	77457
Grand Total	**66**	**502673**

Integrated Farming System

An integrated agricultural system can lessen the chance of crop failure and offer steady cash flow all year long by diversifying its sources of income, which also lessens the income's seasonality. This approach entails supplementing primary agriculture with alternative businesses related to rural off-farm pursuits. Cro based, horticulture based or animal-based IFS models are a few examples of practices that can be included into agricultural systems. The following lists the number of IFS system components that the KVKs of Jharkhand (25) and Bihar (146) have established. Various activities were organizedunder IFS which includes 324 demonstrations for 6115 farmers and 76 training programmes for 1342 number of farmers in Bihar. In Jharkhand 511 demonstration for 985 farmers and 184 training programmes for 5321 farmers were conducted during the reporting period (Table 00).

Table 00: Details component wise IFS activities by KVKs

Component wise IFS activities by KVKs in 2023

State	Component Name	No. of KVKs under the Component	Number of Components established	Area (ha)	Number of Activities		No. of farmers benefited	
					Demo	Training	Demo	Training
Bihar	Cereal crops	5	23	20.45	5	7	108	170
	Dairy unit	6	13	0.472	58	9	926	185
	Fish production unit	8	13	6.38	14	9	723	182
	Horticulture crop	9	70	4.26	123	26	2390	299
	Poultry/Duckery Unit	8	17	0.96	63	13	1043	247
	Small Ruminants	3	6	0.09	58	6	850	142
	Vermicompost	2	3	0.0018	3	6	75	117
	Other Enterprises	1	1	0.01	-	-	-	-
Total of Bihar			146	32.64	324	76	6115	1342
Jharkhand	Cereal crops	3	4	26.20	225	48	409	1315
	Dairy unit	2	2	0.25	51	15	52	387
	Fish production unit	2	2	0.42	2	5	46	260
	Horticulture crop	3	6	1.76	67	42	218	1247
	Poultry/Duckery Unit	3	3	0.09	102	16	145	343
	Small Ruminants	2	3	0.35	3	7	26	226
	Vermicompost	1	1	0.0017	1	3	10	51
	Other Enterprises	2	4	0.0836	60	48	79	1492
Total of Jharkhand			25	29.1 5	511	184	985	5321

Attachment Training Programme

Attachment Training Program for Rural Agricultural Work Experience (RAWE) and other related programs were implemented for students enrolled in agricultural degree programs at various State Agricultural Universities as well as for others trainee probationers. Rural Agricultural Work Experience (RAWE) is a program that provides agricultural students with practical experience in real-world situations, such as working with farm families, identifying problems, and learning about agricultural technologies. The program also aims to help students develop confidence, communication skills, and problem-solving abilities. The primary objective of these program was to familiarize them with the comprehensive agricultural landscape in rural India. During these programs, the trainees including both students and probationary officers, actively engaged with the scientists and administrative staff of KVKs under the guidance of ATARI Zone-IV Patna. This collaboration enabled them to observe and document the diverse activities carried out by the institute. It provides valuable opportunity for the students and trainees to gain practical experience and deeper understanding of agricultural practices in rural areas and they were able to develop insights into the overall agricultural scenario and contribute to their knowledge and skill development. Total 644 students participated in RAWE in 43 districts of

Bihar and 278 students participated in RAWE in 23 districts of Jharkhand in the Year 2023 (Table 00).

Table 00: State wise details of attachment training programme

State	No. of KVKs	No of RAWE trainees	Training duration for RAWE (days)	No of ARS trainees	Training duration for ARS probationers (days)
Bihar	43	644	3333	7	23
Jharkhand	23	278	347	0	0
Total	66	922	3680	7	23

Diploma in Agricultural Extension Service for Input Dealers Program (DAESI)

The Diploma in Agricultural Extension Service for Input Dealers (DAESI) Program, sponsored by the ATMA of Bihar and Jharkhand, aimed to educate Agri-Input Dealers and enhance their ability to serve farmers effectively. This program was conducted in three KVKs in Bihar, namely Buxar, Munger, and Sheohar, as well as two KVKs in Jharkhand, East Sighbhum, and Dhanbad. The objective was to equip Agri-Input Dealers with knowledge and skills to function as para-extension professionals within their respective districts. A total of 293 participants completed the program, which consisted of 9 training courses.

Table: Details of (DAESI)

Viksit Bharat Sankalp Yatra

The Viksit Bharat Sankalp Yatra was a nationwide campaign that aims to implement government schemes across India. The campaign's goal was to ensure that the benefits of government schemes reach all targeted beneficiaries in a timely manner. The campaign raised awareness of and tracks the implementation of central schemes, including: Ayushman Bharat, Ujjwala Yojana, PM Surkasha Bima, and Kisan Samman Nidhi and PM-Kisan scheme. The campaign uses a holistic approach, involving various ministries, departments, organizations, and institutions of the government including Krishi Vigyan Kendra's across the nation.In zone-IV, the first phase of the scheme was launchedon Janjatiya Gaurav Diwas on 15th Nov 2023 upto 25th Nov in 09 districts of Jharkhand and 01 district of Bihar. Later on, in second phase from 26th Nov, the rest of the districts were covered. During this campaign 6042 events were conducted in6867 Gram panchayat covering 1923818 farmers. During this campaign KVK marked their visibility through technical lecture on soil health and natural farming along with soil sample collection, group discussion, trainings, demonstrations. (Table 00).

State	No of events conducted	No. of Gram Panchayat covered	Farmer participated	No of Lecture Delivered on Soil Health/ Natural Farming
Bihar	4131	4495	1485978	6408
Jharkhand	1911	2372	437840	2997
Total	**6042**	**6867**	**1923818**	**9405**

Promotion of Millets under International Year of Millets

The UN General Assembly proclaimed in March 2021 as the International Year of Millets (IYM 2023) in response to a request from India and backing from more than 70 nations. The year's objective was to raise public awareness of millets' benefits and highlight how ideal they are for cultivation in harsh and variable climates and also aimed to highlight the benefits of providing producers and consumers with access to sustainable markets. The KVKs of Bihar and Jharkhand conducted 6 OFTs on finger millets. 770.07 h area for millets (Sorghum, pearl millets, finger millets, kodo millets, foxtail millets and other millets) for front line demonstration. 452 no.of training programme with 14262 no. of participants and 437 no. of extension activities organized with 23257 no. of participants (Table 00).

States	No. of OFTs Finger Millet	FLD (Area in ha)						No. of training programme organized	No. of participants in training programme organized	No. of Extension activity organized (Awareness programme/ Mela, etc.)	No. of participants in extension activity organized
		Sorghum	Pearl Millet	Finger Millet	Kodo millet	Foxtail millet	Others				
Bihar	3	39.05	74.45	246.97	5.95	30.85	25.5	316	9736	288	17480
Jharkhand	3	5	2	325	0.4	0.4	15.4	136	4326	149	5777
Total	6	44.05	76.45	571.97	6.35	31.25	40.9	452	14062	437	23257

Millet Recipe Contest

Under the aegis of ICAR-ATARI Patna, to enhance the practices of growing and consuming millet crops,23 KVKs (10 KVKs in Bihar and 13 KVKs in Jharkhand) has participated and organized Millet Recipe Contests among rural and farm women of various millet producing districts. During the outreach programme, a total 69 Millet Recipe Contest were conducted including 30 in Bihar with 750 Participants and 39 in Jharkhand with 975 participants as mentioned below in Table.These contests were conducted during July-Dec 2023 respectively under the guidance of Director ATARI and coordination of Dr. Pragya Bhadauria, Senior Scientist and nodal officer of the Programme. The event saw the enthusiastic participation of rural women showcasing up to 45-50 types of (conventional and contemporary processed) food recipes using millets as a major ingredient such as Roti, Ladoo, Sev, Dhuska, Idli, Pakodas, and many more. At the end of event, the best contestants were awarded in a well-organized formal meeting. Prizes were arranged in that align with the theme, on the basis of the scores awarded on the basis of different parameters along with knowledge variability on cooking and processing. Women's creativity in food-based conservations and adaptations.These recipe contest presented a unique opportunity to celebrate the rich agricultural heritage and incorporate locally grown millets into their daily lives.

Table 00: State wise details of Millet Recipe Contest in Zone-IV

State	No. of KVKs	No. of Millet Recipe Contest Conducted	No. of Participants
Bihar	10	30	750
Jharkhand	13	39	975
Total	**23**	**69**	**1725**

Technology Week Celebration

ICAR celebrated its 95th Foundation Day as Technology Day from July 16–18, 2023 across the ICAR Institute and KVKs. The main event was organized at the Dr. C. Subramaniam Auditorium of the National Agriculture Science Complex (NASC) in New Delhi. Under Zone-IV, about 56 KVKs marked the celebration in villages for promoting the ICAR technologies. These programmes were conducted for 03 days during July 16-18under the guidance of Director ATARI and coordination of Dr. Amrendra Kumar, Principal Scientist and nodal officer of the Programme. Mass awareness were created among farmers on promotion of production of millets, value addition, seed treatment, azolla cultivation, organic cultivation, Direct Seeded Rice, SR, orchard and its management with new improved varieties of fruits crop, biochar use for improving soil fertility and sustainability, Agri-Drone, drudgery reduction, disease and pest management, food processing, drip irrigation, IFS technology-based approach for sustainable income etc. Under Zone IV, 37 KVKs of Bihar and 19 KVKs of Jharkhand celebrated this week and a total 107 activities with 4635 farmers participated this programme (Table 00).

Table 00: State wise details of technology week celebration

State	No. of KVKs	No. of Millet Activities	No. of Participants
Bihar	37	79	3447
Jharkhand	19	28	1188
Total	56	107	4635

Swach Bharat Abhiyan

As part of the nationwide fortnight cleanliness movement initiated by the Government of India, all personnel of ICAR-ATARI, Patna, including the KVKs, actively participated in cleaning activities, known as Swach Bharat Abhiyan. Under 'Swachhta Hi Sewa' campaign organized during 2nd-31st Oct 2023, a total 53 KVKs within Zone IV of ATARI Patna actively joined efforts to promote awareness about cleanliness and sanitation. Their endeavors reached 628 rural villages, involving 19717 farmers and 512 VIPs (Table 00). These campaigns aimed to foster a sense of responsibility and active

involvement among community members in upholding cleanliness standards and effectively managing plastic waste.

Table: Detail of activities under Swachata Hi Sewa (2nd-31st Oct 2023)

State	No. of KVKs	No. of Activities	No. of Participants			
			Staffs	Farmers	Others	Total
Bihar	37	438	1939	8931	974	11844
Jharkhand	16	190	247	6612	1014	7873
Total	53	628	2186	15543	1988	19717

The KVKs played a pivotal role in amplifying the cleanliness campaign by spreading awareness among farmers and villagers, advocating the slogan "Neither litter, nor let others litter." Armed with brooms and other cleaning tools, the entire staff diligently cleared dirt, garbage, debris, litter, and other unwanted materials from office premises, roads, and residential areas. In addition to the cleanliness drive, a series of awareness programs, workshops, and campaigns were organized by the KVKs. Across the 53 KVKs of ICAR-ATARI, Patna zone, a total of 543 activities were conducted during this campaign, engaging 2081 staff, 31736 farmers and total 35502 participants (Table 00). Although, these collective effortswere conducted during the whole year under the guidance of Director ATARI and coordination of Dr. Pragya Bhadauria, Senior Scientist and nodal officer of the Programme as cleanliness drive aimed to instill a shared responsibility for fostering a cleaner and healthier environment.

Table: Celebration of Swachata Pakhwada (16th to 31st Dec 2023)

State	No. of KVKs	No. of Activities	No. of Participants			
			Staffs	Farmers	Others	Total
Bihar	37	355	1666	23296	714	25676
Jharkhand	16	188	415	8440	971	9826
Total	53	543	2081	31736	1685	35502

Rastriya Mahila Kisan Diwas

India's female farmers make up 48% of all employment in agriculture-related activities. To honor their contributions, every year the nation observes "Rashtriya Mahila Kisan Divas" on October 15th.The theme for year was"Millets: Empowering Women and Providing Nutritional Security and the World". As a part of "International Year of Millets", the ICAR Institutes, Agricultural Universities, and KVK collaborated to host this event on women's empowerment, agriculture, nutrition, and income production. The 48 KVK of the Zone-IV with 3213 participants focused on various issues related to women empowerment as well as role of women in agricultural sector through debates, exhibitions, discussions, and competitions (Table 00). Outstanding women from the district were also recognized during various programmes.

Table : Detail of the activities conducted during Mahila Kisan Diwas

State	No. of KVKs	No. of Participants
Bihar	27	1249
Jharkhand	21	1964
Total	48	3213

International Yoga Day

On June 21st, the International Yoga Day honors the value and health benefits of yoga, with the 7th theme being 'Yoga for Vasudhaiva Kutumbakam'. The 61 KVKs of Bihar and Jharkhand organized various activities, including yoga classes, meditation sessions, discussions, and meetings with a variety of cultural performance were organized with 2110 participants. (Table 00).

Table : Detail of the activities conducted during international Yoga Day

State	No. of KVKs	No. of Participants
Bihar	42	1377
Jharkhand	19	733
Total	61	2110

International Food Day

The 44 KVKs of the Zone-IV celebrated International Food Day on October 16thOct. 2023. The day raises awareness about hunger and promotes action for the future of food, people, and

the planet. This year focus on the theme, 'Water is Life, Water is Food. Leave No One Behind'. The theme aims to highlight the critical role of water for life on earth and water as the foundation of our food.

Table : Detail of the activities conducted during International Food Day

State	No. of KVKs organized the event	No. of farmers Participants
Bihar	22	1168
Jharkhand	12	555
Total	34	1723

World Soil Day celebration

Every year, December 5th, is celebrated as the "World soil Health Day" across the country. KVKs of Zone-IV also celebrated the day in the states of Bihar and Jharkhand. Many KVKs organized different programs in collaboration with State Department of Agricultural to sensitize farmers about soil health. As many as 5678 people participated in the KVK programs along with 75 VIPs throughout the states of Zone 1V with a total 2310 number of soil health cards distribution among the farmers. KVKs also spread awareness about benefits of soil testing, importance of soil testing kit, interpreting soil health cards, soil testing-based fertilizer application, ill effects of excessive application of chemical fertilizers, balanced fertilizer application, Integrated Nutrient Management (INM) in different field and horticultural crops, Integrated Pest Management (IPM), etc. Similarly, many KVKs organized exhibitions for the farmers on soil health, soil sampling, soil testing techniques, good agricultural practices and soil and environment friendly technologies. Moreover, appropriate methods of soil sample collection were also demonstrated to the farmers.

Table 00: State wise details of World Soil Day celebration at KVKs on 5th December 2023

State	No. of KVKs	No. of farmers benefitted	Soil Health Cards distributed	Soil Health Cards distributed	No. of VIPs attended
Bihar	42	3353	1679	3918	46
Jharkhand	18	1270	631	1760	29
Total	60	4623	2310	5678	78

Vigilance Awareness Week

ICAR-ATARI, Patna celebrated Vigilance Awareness Week from 30th October to 5th November, 2023. Dr. Anjani Kumar, Director, ICAR-ATARI, Patna, Principal Scientists and Senior Scientists, Administrative Officer and All Project Staff actively participated in this event of ICAR-ATARI, Patna. During the address of the Director ATARI, Dr.Anjani Kumar, urged the employees to continue contributing to their fullest capacity for the Institute's overall growth. He also stressed on following the office ethics, protocols, guidelines and conduct rules to maintain the Institute's integrity.To mark the celebrations, the Institute organized elocutioncompetition on the theme –"Say no to corruption; commit to the Nation" and also taken pledge for the same.

Hindi Pakhwada

ICAR-ATARI, Patna organized Hindi Pakhwada on 08th Sept. to 22nd Sept. 2023. Director, ICAR-ATARI, Patna, Principal Scientists and Senior Scientists, Administrative Officer and all Project Staff actively participated in this event. During the fortnight, the importance of hindi and its usage in official work was stresses upon by the chairman of the programme. Since the institute is committed to the promotion of the official language hindi, various competitions such as essay writing, poetry recitation, hindi vocabulary and debate competitions were also organized during the fortnight. All the officers and employees of the institute participated enthusiastically in all these competitions and awarded with prizes.The entire program was coordinated by Dr. Pragya Bhadauria, Scientist and Officer-in-Charge, Official Language

and her team under the patronage of Dr. Anjani Kumar, Director, ICAR-Agricultural Technology Application Research Institute, Ludhiana.

World Intellectual Property Day

ATARI Patna has organized Programmes (Virtual mode) this day on 26th April 2023. Director ATARI, PATNA and DEE BAU Sabour DEE BAU Ranchi, DEE, BASU, DEE DRPCAU, Principal. Scientists & Sr. Scientist of ATARI and Heads of all KVKs actively participated in this Programmes. During the discussion, the importance of patents, copyrights, trademarks, and designs in agricultural system was discussed. Also, KVKs were motivated to identify the areas which comes under IPR domain so that due credit may be provided for the same. As per the ICAR guidelines, the session also witnesses the views of women scientists of ATARI/women experts from different KVKs to share their knowledge and experience.

Annual Zonal Workshop

6th Annual Zonal Workshop of Krishi Vigyan Kendras was organized by ICAR-ATARI, Patna on 08-10th July 2023 at Ramakrishna Mission Ashrama, Ranchi, Jharkhand. Dr. U. S. Gautam, DDG (AE); Dr. R.K. Singh, ADG (AE) ICAR, New Delhi, Swami Bhaveshananda, Secretary, RKM, Ranchi, Dr. Keshava, Principal Scientist, ICAR (HQ), Director and DEE of different ICAR and Universities has been participated in this zonal workshop. There are almost 470 dignitaries, delegates, administrative staffs and project staff have been actively participated in this Zonal Workshop.The workshop primarily addressed the major challenges faced by the KVKs in the current scenario and work to prioritize the agricultural issues confronted by farmers in their respective districts. There is also need for quantifying the technology gap within the operational areas of the KVKs to work towards achieving the goal of zero technology and zero hunger. The workshop served as an important platform for knowledge exchange, collaboration, and furthering the goals of agricultural extension and rural development though Krishi Vigyan Kendras.

Foundation Day of ICAR-ATARI

8th foundation day of ICAR-ATARI, Patna was organized on 19th August 2023 at BAMETI, Patna.Dr. A.K. Singh, VC. RLBCAU, Jhansi, U.P. was the chief guest. Dr. R.R. Burman, ADG (AE) ICAR, New Delhi; Sri Anil Kumar Jha, Joint secretary Agriculture, Patna; Dr. Vishal Nath, Director, IARI, Hazaribagh; Dr. K.G. Mandal, Director, IGFRI, Motihari; Dr. Anup Das, Director ICAR-RCER, Patna; Dr. Shantanu Kumar Dubey, Director ICAR-ATARI, Kanpur; Sri Abhyanshu C. Jain, Director BAMETI, Patna; were the guest. DEE and Director of different Universities, Head of the different KVKs of Bihar and Jharkhand has been participated in the foundation day ceremony. There were almost 278 dignitaries, delegates, administrative staffs and Project staff have been actively participated on the occasion of foundation day. During the occasion felicitation of progressiveentrepreneursof Bihar and Jharkhandwas done along with release of publication. In technical session scientist-farmers Interaction was successfully carried out for the benefit of farming community. An exhibition of products and technologies from different KVKs were also served as center of attraction of the event.

State Level Workshop on Natural farming

On 17th September 2023, a two-day State Level Natural Farming Conference was organized by Agricultural Technology Application Research Institute, Patna and Krishi Vigyan Kendra, Piprakothi, which was inaugurated by Shri Rajendra Vishwanath Arlekar, Honorable Governor of Bihar at Gandhi Auditorium, Motihari. Shri Radha Mohan Singh ji, Honorable MP, Motihari and former Agriculture and Farmers Welfare Minister, Government of India, was present as a special guest in the program. Shri Pramod Kumar,

Honorable MLA Motihari and former Sugarcane and Law Minister, Government of Bihar, Dr. U.S. Gautam, Honorable Deputy Director General, Indian Council of Agricultural Research, New Delhi, Dr. P.S. Pandey, Honorable Vice Chancellor, Dr. Rajendra Prasad Central Agricultural University, Pusa, Bihar, Dr. Anjani Kumar, Director ATARI, Patna, MLAs of the area, agricultural scientists from Bihar and Jharkhand and more than 500 farmers associated with natural farming taken part during the programme. The workshop primarily focused on the significance of natural farming in the current era of climate change. On the second day during the technical session, national level eminent scientists of ICAR gave their exeprt lecture related to natural farming. In this two-day state level natural farming conference, senior scientists and heads of all the agricultural science centers of Bihar, Jharkhand and farmers of both the states participated. Farmers also visited the natural farming unit established at the Agricultural Science Center Pipra Kothi along with other demonstration units.

Orientation Programme

ICAR-ATARI, Patna welcomes the 1st batch of IARI Hub of ICAR-RCER Patna on 05 Dec 2023.There were 18 undergraduate stident along with three Ph.D student that has enroll in this centre. ICAR-ATARI as satellite center gave an orientation and exposure regarding the national extension system along with useful inputs regarding their academics.

Interactive Meeting with DDG

ICAR-ATARI, Patna Organized Interactive Meet with DDG, VCs, Director and DEE Of Universities on 16/09/2023. Dr. U.S Gautam, DDG Agriculture Extension, Dr. P.S Pandey, VC, RPCAU PUSA, Dr. Rameshwar Singh, VC, BASU, Dr. Anup Das Director, ICAR-RCER, Patna Dr. Anjani Kumar, Director, ICAR-ATARI Patna, and DEE of respective Universities, Pr. Scientists and Sr. Scientists of ICAR-ATARI, Patna, actively participated in this Meeting.During the meeting, the various issues related to host organization and their inputs with regards tosmooth functioning of Krishi Vigyan Kendras (KVKs) in the Zone are discussed in details.

Visits of Ministers

ICAR-ATARI, Patna Campus visited on 11th Oct 2023, Shri Ravi Shankar Parasad, (M.P), Shri Radha Mohan Singh (M.P), Shri Samarat Chaudhary (MLC) and Shri Sanjiv Chaurasia (MLA) along with Dr. Anjani Kumar, Director, ICAR-ATARI, Patna, Pr. Scientists and Sr. Scientists of ICAR-ATARI, Patna, actively participated in this visit.

Visit of DG ICAR

Hon'ble Dr Himanshu Pathak, Secretary (DARE) and Director General (ICAR) visited ICAR-ATARI Patna on 27thFeb. 2023. The DG interacted with Director and Staff of the Institute and encourage them to work in line with mandate of ICAR. A detailed discussion on research mandate of Institute, ongoing flagship programmes and role of KVKs in dissemination of technologies by KVKs on farmers' fields was also held.

Krishi Vigyan Kendra (KVK) Knowledge Network/KVK Portal

The KVK Knowledge Network/Portal (www.kvk.icar.gov.in) was created by the ICAR in order to address this problem and close the communication gap between farmers and KVK. KVK scientists contribute data to the portal, facilitating the rapid national and district-wide adoption of new technologies. 68 KVKs from the ICAR-ATARI, Patna, (24 in Jharkhand and 44 in Bihar) have uploaded a variety of data to the platform. This comprises reports on KVK profiles, facilities that are available, events from the past and present, a practice package, etc. The use of location-specific technology modules in the fields of agriculture, livestock, fisheries, and associated industries is the focus of the Krishi Vigyan Kendra (KVK). In addition, it supports the agricultural sector by acting as a knowledge and resource center for agricultural technology.

KRISHI Portal

The KRISHI (Knowledge-based Resources Information Systems Hub for Innovations in Agriculture) Portal was created as an ICAR Research Data Repository for knowledge management between 2016 and 2017 to till date. By providing information on data availability at the institute level, the Data Inventory Repository seeks to create Meta Data Inventory. The six repositories that make up the portal are: technology, publications, observational data, survey data, experimental data, and geo-portal. The URL for the portal is http://krishi.icar.gov.in. Institute publishing data is being actively uploaded to the ICAR-KRISHI Portal by ICAR-ATARI.

Management Information System (ARMS)

Agricultural Research Management System 2.0 (ARMS 2.0) is an important tool developed and implemented in ICAR for agricultural research management and monitoring on real time basis. In this system each scientist needs to upload his or her scientific achievements in various categories. All scientists of ATARI has been entering the information into the system on regular basis.

Implementation of E-Office/E-hrms

The National Informatics Centre (NIC) created the e-Office program, which was introduced in 2009 with the goal of improving the efficacy, efficiency, and transparency of intergovernmental transactions and procedures. In order to provide a more straightforward, responsive, efficient, and transparent working environment in the office, ATARI Patna has also begun working on e-Office. Along with this ATARI has fully implemented the E-hrms system regularly updated its system for human resource management (HRM), payroll module and other modules.

Table 00: Details of other Important Days Celebrated in KVKs

Important Days	Bihar			Jharkhand			Total		
	No. of KVKs celebrate	No. of Activities	No. of Participants	No. of KVKs celebrate	No. of Activities	No. of Participants	No. of KVKs celebrate	No. of Activities	No. of Participants
National Fisheries Day (21 Nov.)	13	13	574	3	3	201	16	16	775
Ambedkar Jayanti (14th Apr.)	12	12	323	9	9	310	21	21	633
Bihar Diwas	2	2	90				2	2	90
Gandhi Jayanti (2nd Oct.)	31	31	1140	17	17	951	48	48	2091
Hindi Diwas (14th Sep.)	20	20	712	7	7	301	27	27	1013
ICAR Foundation Day and Technology Day celebration	16	16	2038	3	3	316	19	19	2354
Independence Day (15th Aug.)	40	40	2396	20	20	1216	60	60	3612
International Wetland's Day (2nd Feb.)	2	2	87	0	0		2	2	87
International Women's Day (8th Mar.)	25	25	1939	19	19	1930	44	44	3869
International Year of Millets	4	4	317	0	0		4	4	317

Important Days	Bihar			Jharkhand			Total		
	No. of KVKs celebrate	No. of Activities	No. of Participants	No. of KVKs celebrate	No. of Activities	No. of Participants	No. of KVKs celebrate	No. of Activities	No. of Participants
International Yoga Day (21st Jun.)	42	42	1377	19	19	733	61	61	2110
Jal Jeevan Hariyali Diwas	1	1	57				1	1	57
Jharkhand Foundation Day (15th Nov)		0	0	1	1	85	1	1	85
Kisan Diwas (23rd Dec.)	30	30	4662	18	18	2408	48	48	7070
Krishi Shiksha Diwas (3rd Dec)	1	1	35	0	0	0	1	1	35
Mahila Kisan Diwas (15th Oct.)	27	27	1249	21	21	1964	48	48	3213
National Constitution Day (26th Nov.)	22	22	915	12	12	611	34	34	1526
National Education Day (11th Nov.)	14	14	698	5	5	319	19	19	1017
National Science Day (28 Feb)	2	2	84	2	2	49	4	4	133
National Unity Day (31st Oct.)	13	13	589	9	9	409	22	22	998
Parthenium Awareness Week (16th to 22nd Aug.)	41	41	4444	18	18	2303	59	59	6747
Republic day (26th Jan.)	43	43	2533	19	19	934	62	62	3467
Tree plantation & Poshan Mela (17th Sep.)	1	1	87				1	1	87
Vigilance Awareness Week (27th Oct. to 2nd Nov.)	20	20	710	12	12	912	32	32	1622
World Bee Day (20th May)	3	3	93	3	3	123	6	6	216
World Environment Day (5th June)	19	19	2030	2	2	286	21	21	2316
World Food Day (16th Oct.)	22	22	1168	12	12	555	34	34	1723
World Milk Day World	13	13	660	7	7	278	20	20	938
World Science Day (10th Nov.)	14	14	480	6	6	308	20	20	788
World Soil Day (5th Dec.)	41	41	3019	21	21	2124	62	62	5143
World Water Day (22nd March)	5	5	245	1	1	36	6	6	281
World's Veterinary Day	7	7	225	3	3	125	10	10	350
Any other day	9	9	1103	1	1	0	10	10	1103

On-line reporting by KVKs

The preparation of reports and data collecting for Zone IV are essential for keeping an eye on ICAR-ATARI Patna's operations. Email, Google Sheets & Google Forms have been used by ICAR-ATARI Patna to create an online data collection system. Numerous topics are covered by these platforms, such as the outcomes framework, documentation,

monthly financial and physical progress reports, KVK mandated activities OFT, FLD, Capacity building, extension activities, soil analysis, special programs, and flagship programme. To ensure user-friendliness and prompt reporting, the Zone's KVKs have all received specific directives.

Interaction/Live Telecasted Programme of Hon'ble Prime Minister/Agriculture Minister/Govt. of India

The Prime Minister of India, alongside the Minister of Agriculture and Farmer's Welfare, has engaged in multiple interactions with farmers nationwide on various occasions. These sessions were broadcasted live to reach as many farmers as possible. Altogether, 18 programs were directly telecasted to farmers by all 68 KVKs of the Zone, engaging a total of 45193 individuals.

Table 00: Interaction/Live Telecasted Programmes of Hon'ble Prime Minister/Agriculture Minister/Govt. of India

SI No.	Date	Name of event	No. of Programme	Participated
1	01.11.2023	Live Prayogshala Se Khet Tak, Sawal Jawab Karyakaram	3	87
2	03.11.2023	Inauguration of World Food India 2023	2	98
3	06.05.2023	Interaction with Central Agricultural Minister	1	25
4	08.06.2023	Malnutrition Eradication Programme at DKAC inauguration by Hon'ble Agriculture Minister, GoB	5	573
5	09.12.2023	PM Live on Vikshit Bharat Sankalp Yatra 2023	27	4629
6	13.10.2023	Kisano Se Baat Krishi Mantri Ke Sath Hon'ble AM, GoB	17	639
7	15.11.2023	Live telecast program of Hon'ble PM for Release of 15th Installments of PM KISAN Samman Nidhi	42	4976
8	16.07.2023	95th ICAR Foundation Day & Technology Day	11	1484
9	16.12.2023	PM Programme on Viksit Bharat Sankalp Yatra	15	5997
10	18.03.2023	Live Telecast of PM Global Millet Conference & Training prog on millets opportunity in natural farming	25	2411
11	27.02.2023	Live telecast program of Hon'ble PM on Kisan Samman Nidhi (13th Installments)	35	3041
12	27.04.2023	Live Telecast Program of Hon'ble PM Samman Nidhi Sah Anna Utpadan	3	397
13	27.07.2023	Live telecast program of Hon'ble Prime Minister on the occasion of 14th installment of PM Kisan Samman Nidhi	49	5571
14	27.12.2023	Live webcast for VBSY and Launch of New Schemes by Hon'ble Prime Minister	15	7751
15	30.04.2023	Live webcast for VBSY and Launch of New Schemes by Hon'ble Prime Minister	34	3356
16	30.09.2023	Launch of Sankalp Saptaah Under the Aspirational Blocks Programme	22	2539
17	30.11.2023	Viksit Bharat Sankalp Yatra	2	394
18	08.12.2023	Live telecast of Hon'ble PM Programme on VBSY	2	1225
	Total		**310**	**45193**

HUMAN RESOURCE DEVELOPMENT PROGRAMME

The Human Resource Development Programme of the institute were aim to enhance the technical knowledge, skills, and subject matter expertise of the Institute as well as KVK staff thereby increasing their efficiency in carrying out their assignments and supporting their career development. The institute encourages scientists and other staff members to pursue advanced training, actively participate in subject-specific capacity building programmes in line with their areas of work. Additionally, scientists are encouraged to serve as resource persons or instructors, providing training to extension personnel from state development agencies, SAUs, and ICAR Institutes. The following presents a compilation of various meetings, workshops, conferences, and training programs that were conducted to facilitate human resource development and skill enhancement activities.

Table. Details of HRD activities/Review meeting organised by ICAR-ATARI, Zone-IV

Sr. No.	Name of scientific official	Name of event	Date	Venue
1.	Dr. Anjani Kumar, Dr. Amrendra Kumar and Dr. Mukesh Kr. Sinha	Review meeting on Financial Expenditure 2022-23	10 -11 Jan 2023	Patna
2.	Dr. Anjani Kumar, Dr. Amrendra Kumar	Review meeting on Financial Expenditure 2022-23	13 th Feb 2023	Patna
3.	Dr. Anjani Kumar and Dr. Amrendra Kumar	Review meeting cum training for the Assistant of KVKs of ICAR-ATARI, Patna	20th Feb 2023	Patna
4.	Dr. Anjani Kumar, Dr. Amrendra Kumar and Dr. Mukesh Kr. Sinha	Zonal Workshop on CFLD Pulses & Oilseed at ICAR-RCER, Patna	18 -19 th March 2023	Patna
5.	Dr. Anjani Kumar, Dr. Amrendra Kumar and Dr. Mukesh Kr. Sinha	Annual Zonal Workshop of ARYA, FFP, NICRA & SEED HUB at ICAR-ATARI, Patna	25th March 2023	Patna
6.	Dr. Anjani Kumar, Dr. Amrendra Kumar and Dr. Mukesh Kr. Sinha	Workshop cum training for Assistant for KVK under ATARI, Patna	22-24 May 2023	Patna
7.	Dr. Anjani Kumar, Dr. Amrendra Kumar and Dr. Mukesh Kr. Sinha	Convergence Platform meeting (ICAR-CISA Collaboration Programme)	05th June 2023	Patna
8.	Dr. Anjani Kumar, Dr. Amrendra Kumar, Dr. Mukesh Kr. Sinha and Dr. Pragya Bhadauria	6th Annual Zonal Workshop for KVKs for Zone-IV	8-10 th July 2023	Ranchi
9.	Dr. Anjani Kumar, Dr. Amrendra Kumar and Dr. Pragya Bhadauria	Two days state level workshop on Natural Farming	17 -18 th July 2023	Motihari
10.	Dr. Anjani Kumar, Dr. Amrendra Kumar	Convergence Platform meeting for Pre-Rabi at ICAR-ATARI, Patna	17 th Nov 2023	Patna

Table: List of ongoing project and schemes

S.No	Title of project/Programme	Nodal officers
	Externally funded Projects	
1.	Attracting and retaining youth in agriculture (ARYA)	Dr. Amrendra Kumar
2.	Climate resilient agriculture technology demonstration (NICRA-TDC)	Dr. Amrendra Kumar
3.	Cluster Front line demonstration (CFLD) on oilseed	Dr. Amrendra Kumar

S.No	Title of project/Programme	Nodal officers
	Externally funded Projects	
4.	Cluster frontline demonstration (CFLD) on pulses	Dr. Amrendra Kumar
5.	Farmer FIRST Programme (FFP)	Dr. Pragya Bhadauria
6.	District Agro Metrological Unit (DAMU)	Dr. Amrendra Kumar
7.	CSISA-ICAR Collaborative project phase -III (CSISA)	Dr. Amrendra Kumar
8.	New Extension Methodology and Approaches (NEMA)	Dr. Pragya Bhadauria
9.	Agri-Drone project	Dr. Amrendra Kumar
10.	The out scaling of natural farming through Krishi Vigyan Kendra	Dr. Pragya Bhadauria
11.	Tribal Sub Plan (TSP)	Dr. Amrendra Kumar
12.	Scheduled Caste Sub Plan (SCSP)	Dr. Pragya Bhadauria
13.	Formation and promotion of Farmer Producer Organization (FPO) by KVKs and ICAR institute	Dr. Pragya Bhadauria
14.	Microbial Waste Management through Vermicomposting under SAP	Dr. Pragya Bhadauria
15.	Seed Hub	Dr. Amrendra Kumar
	Institute Projects	
1.	Characterization of farming System Typologies of Zone IV Agroclimatic Conditions implemented Through KVKs	Dr. Amrendra Kumar
2.	Nutri-Sensitive Agricultural Resources and Innovation (NARI)	Dr. Pragya Bhadauria
3.	Evaluation of Vermicomposting Technology for Dairy Waste Management at Household Level	Dr. Pragya Bhadauria

PUBLICATION

In order to promote the dissemination of research and technology transfer through scientific, and local language through print media, scientists at ATARI and KVKs are actively encouraged to engage in publishing a wide range of materials. These include research papers, books, book chapters, technical bulletins, newsletters, popular articles, leaflets/pamphlets, and DVD/CD resources. The purpose of this initiative is to make valuable information accessible to researchers, extension workers, KVKs, SAUs, ICAR institutes, line departments, ATMA, NABARD, other agencies, farmers, and other stakeholders.

In this zone, KVK personnel have made significant contributions with a total of 1930 publications. These include 126 research papers, 52 books, and 76 book chapters. Such publications serve to enhance the knowledge sharing and collaboration among various stakeholders, ultimately benefiting the agricultural community and facilitating the effective utilization of research outcomes.

Table: Details of Publications by ATARI Scientists during 2023

Research Paper

1. Pawan Singh, Hemant Kumar Singh, Rajeev Singh, M K Roy, Amrendra Kumar and **Anjani Kumar** 2023: Effect of bunch cover on production, fruit quality and damage by scarring beetle of banana (*Musa paradisiaca L.*) The Pharma innovation Journal 12(9): 331-334.
2. Atar Singh, A K Singh, S K Dubey, VP Chahal, Randhir Singh, Anupam Mishra, Rajbir Singh, B C Deka, S K Singh, S S Singh, Lakhan Singh, A K Tripathi, Y G Prasad, **Anjani Kumar**, M J Chandra Gowda, Sadhna Pandey and Rajeev Singh 2023. Ensuring Productivity advantages through Cluster Frontline Demonstration (CFLD)-Pulses: Nationwide experiences, I.J. Ag. Sci. 93(5): 561-566.

3. Yogi RK, Sharma AK, Kumar Sanjay, Tiwari AB, Rajan Neha, **Kumar Anjani** and P K Rai 2023 Capital formation through Technology Integrated Approaches for Tribal communities: A Pragmatic Analysis. Journal of Oilseeds Research. 40 (Special issue) 15-16.
4. Vishakha Singh, **Ajeet Kumar Singh**, Ravindra Kumar Singh, Dharma Oraon, Ranjay Kumar Singh, Anjani Kumar and Keshava 2023. Physiochemical evaluation of complementary foods mix formulated from functional ingredients. The Pharma Innovation J. 12(4): 1691-1694.
5. Vishakha Singh, Ajeet Kumar Singh, Ravindra Kumar Singh, Dharma Oraon, Ranjay Kumar Singh, **Anjani Kumar** and Keshava 2023. Physiochemical analysis and product development from malted and unmalted sorghum millet. The Pharma Innovation J. 12(4):1779-1784.
6. Aparna, **Pragya Bhadauria**, Satbir Singh and G.S. Makkar. 2023. On-farm evaluation of Azolla as a non-conventional feed ingredient in broiler diets under backyard rearing system. *Indian Journal of Poultry Science* 58(2): 117–121.
7. Vinita Yashveer, Ravikant Nirala, Ravi Ranjan Kumar Sinha, Sudha Kumari, Dhirendra Kumar and **Pragya Bhadauria**. 2023. Evaluation of Growth, Production and Reproduction Performance Traits of Dahlem Red and their Crosses with Native Breeds in the AgroClima tic Conditions of Bihar. *Progressive Research*. 19 (1): 31-36
8. Ravikant Nirala, AKS Tomar, Ravi Ranjan Kumar Sinha, Vinita Yashveer, **Pragya Bhadauria**, Cherryl D. Miranda 2023. Economic analysis of culling in Vrindavani cows Culling in Vrindavani cows. *Journal of AgriSearch*. 10(3):196-200.
9. Rohit Gupta, Surendra S Lathwal, Shilpi Kerketta, **Pragya Bhadauria** and Ahmad Fahim Spectrum analysis of buffaloes acoustic signature for their individuality identification. International Journal of Veterinary Sciences and Animal Husbandry 2024; SP-9(2): 231-237

Technical/Popular Articles

1. Sudeepa Kumari Jha, Md. Monobrullah, Anjani Kumar and Milan Kumar Chakravarty 2023 Royal Jelly, Indian Farming 73 (04) 18-20
2. Dharmendra Kumar, Pragya Bhadauria, Anjani Kumar, Rajesh Kumar and R K Sohane 2024 Round the year fodder production model for small and marginal farmers of Bihar, Indian Farming 74(3) 35-39
3. Priyanka Kumari, Amrendra Kumar, Anjani Kumar, Pragya Bhadauria and Pushpa Kumari 2024 Improved Agrotechnique for Makhana cultivation. Indian Framing 74(3) 40-43
4. Vishakha Singh, Pragya Bhadauria, Ajeet Singh, Anjani Kumar and Rajan K Singh 2024 Millet recipe contest: A community engagement model for exploring the millet diversity in Jharkhand. Indian farming 74(3) 44-47
5. Anjani Kumar, Pragya Bhadauria and Amerandra Kumar. 2023. Unleashing

the Potential of Secondary Agriculture in Bihar and Jharkhand through Krishi Vigyan Kendras. *Agriculture World*. 9(12):42-25.

6. Dharmendra Kumar, Pragya Bhadauria, Anjani Kumar, Rajesh Kumar, R.K. Sohane.2024. Village based Round the Year Fodder Production Model for Small and Marginal Farmer of Bihar. *Indian Farming*.
7. Vishakha Singh, Pragya Bhadauria, Ajeet Singh, Anjani Kumar and R.K Singh. 2023. Millet Recipe Contest: A Community Engagement Model for Exploring the Millet Diversity in Jharkhand. *Indian Farming*.
8. Priyanka Kumari, Amrendra Kumar, Anjani Kumar, Pragya Bhadauria and Pushpa Kumari 2024. Improved Agro-technique for Makhana cultivation. *Indian Farming*.

9. सुदीपा कुमारी झा, मो.मोनोब्रुल्लाह, अंजनी कुमार एवं के ाव:2023 नैरोबीमक्खी का आतंकतथाबचाव, खेती, मार्च 2023, 20
10. खेती, अजीत कुमार सिंह, रविन्द्र कुमार सिंह, अंजनी कुमार, अमरेन्द्र कुमार एवं प्रज्ञा भदौरिया 2024 स्थानीय संसाधन आधारित जैविक खेती से बढ़ाएं आमदनी / खेती 76(11) 10–14.
11. सूरज कुमार, अरविन्द कुमार सिंह, आनंद कुमार, तेजस्विनी कपिल, अं ा गंगवार एवं अंजनी कुमार 2024 भून्य जुताई से गेहूँ उत्पादन / खेती 76(11):46–47
12. रीता सिंह, मृणालवर्मा, अमरेन्द्र कुमार एवंअंजनीकुमार : 2024 कृषि में ड्रोन का बढ़ता उपयोग। खेती 76(11) :48–51.
13. तेजस्वनी कपिल, अरविन्द कुमार सिंह, आनंद कुमार, अं ा गंगवार, प्रज्ञा भदौरिया एवं अंजनी कुमार 2024 नाडेप पद्धति से कृषि ठोस अपशिष्ट प्रबंधन / खेती 76(11):61–64.
14. अजय सिंह गोदारा, गुरदीप सिंह,एवं प्रज्ञा भदौरिया. 2023. लाभदायक व सरल व्यवसाय बकरी पालन आई सी ए आर –शीत जल मत्स्य अनुसंधान निदेशालय. हिमज्योति. 123–125.
15. रवि रंजन कुमार सिन्हा, रविकांत निराला,एवं प्रज्ञा भदौरिया. 2023. डयेरी फार्मिंग एक लाभदायक व्यवस्याय बिहार पशुपालन विश्वविद्यालय. पशुपालन दर्शिका 1(1):11–12.
16. रविकांत निराला, प्रज्ञा भदौरिया रवि एवं रंजन कुमार सिन्हा. 2023. बैकयार्ड मुर्गीपालन ग्रामीण समुदाय की आजीविका एवं पोषण सुरक्षा के लिए एक उत्तम विकल्प. बिहार पशुपालन विश्वविद्यालय. पशुपालन दर्शिका 1(1):23–24.
17. प्रज्ञा भदौरिया, अंजनी कुमार एवं सीमा यादव 2024 वर्मी कम्पोस्टिंग के माध्यम से पशुधन अपशिष्ट प्रबंधन आई सी ए आर–शीत जल मत्स्य अनुसंधान निदेशालय. हिम ज्योति.

Technical bulletins/Reports/Books

1. Amrendra Kumar and Pragya Bhadauria. 2023. Special Issue of Purvi Kiran on 95th ICAR Foundation & Technology Day.ICAR-Agricultural Technology Application Research Institute, Zone-1V, Patna, India.pp:56
2. Bhaduria Pragya, Singh Satbir, Aparna, Singh Inderjeet and Sheoran Parminder. 2023. Pig Farming. Technique & technologies. ICAR-Agricultural Technology Application Research Institute, Zone-1, Ludhiana, India.pp:125
3. Brar Navjot Singh, Kaur Simerjeet, Hundal Jaspal Singh, Kaur Maninder, Bhadauria Pragya, Kumar, Balwinder, SheoranParvender and Singh Rajbir. 2023. Silage Making: An Emerging Enterprise for Dairy Sector. Indian Council of Agricultural Research, New Delhi. pp:112
4. SheoranParvender, Bhadauria Pragya, Bhadauria Sudhir Singh and Shah Rayees Ahmad. 2023. Multidisciplinary

Portrait of Agriculture:Concept & Practices. ICAR-Agricultural Technology Application Research Institute, Zone-1, Ludhiana, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, National Agriculture Development Cooperative Ltd. Baramulla, INDIA

Book Chapter

1. Pragya Bhadauria, Satbir Singh and Rajbir Singh. 2023. Socio-economic Impact of Livestock preurnship on Pig Farmers in Punjab. pp: 189-197. Changing Face of Rural Economy: An Analytical Perspective. ISBN 978-81-7622-541-0
2. Pragya Bhadauria, Anjani Kumar, Atish Kumar and Amrendra Kumar. 2023. Revival of Ancient Grain as Shree Ann for Sustainable Ecosystem. Multidisciplinary Portrait of Agriculture: Concept & Practices. ICAR-Agricultural Technology Application Research Institute, Zone-1, Ludhiana, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, National Agriculture Development Cooperative Ltd. Baramulla, INDIA. ISBN 978-81-7622-541-0
3. Pragya Bhadauria, Anjani Kumar, Rohit Kumar and Amrendra Kumar. 2023. Natural Farming for Sustainable Soil Health Management in Climate Change Scenario. Multidisciplinary Portrait of Agriculture: Concept & Practices. ICAR-Agricultural Technology Application Research Institute, Zone-1, Ludhiana, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, National Agriculture Development Cooperative Ltd. Baramulla, INDIA, ISBN 978-81-7622-541-0.
4. Bilawal Singh, Amandeep Singh, Y.S. Jadoun, Pragya Bhadauria and Gurpreet Kour. Strategies for Sustainable Climate Smart Livestock Farming. Springer
5. Arunveer Singh, Pragya Bhadauria and Sabnam Siddhu. 2023. Livestock Production System with special reference to Northern States of India. Entrepeurship in Integrated Farming System. ISBN 978-93-5461-72-6 (technology).

Presentation in workshops/ seminars/ symposia/ conferences

1. Dharmendra Kumar, Pragya Bhadauria, Anjani Kumar, R.K. Sohane and Pankaj Kumar. 2024. Enhancing Milk Production in Dairy Cattle through Effective Management of Combined Harvested Paddy Straw in 02 days National Conference on "Enhancing Farmer's Income by Livestock, Poultry and Aqua Farming through Sustainable and Eco-friendly Smart Technologies and Practices" organized by Bihar Veterinary College, BASU Patna.

2. Pragya Bhadauria, Aparna, Rajbir Singh, ParvenderSheoran and Anjani Kumar. 2024 Assessment of impact making livestock technologies and their adoption trends in north-western India in 02 days

National Conference on "Enhancing Farmer's Income by Livestock, Poultry and Aqua Farming through Sustainable and Eco-friendly Smart Technologies and Practices" organized by Bihar Veterinary College, BASU Patna.

AGRICULTURE TECHNOLOGY INFORMATION CENTRE (ATIC)

ATIC stands for Agricultural Technology Information Center, it is a system that connects research institutions with end users and intermediary users. ATICs are established in ICAR institutes and State Agriculture Universities (SAUs) to provide research information, technologies, products and service to farmers and other interested groups. ATIC complements KVKs by serving as a centralized information hub.

ICAR-ATARI, Zone IV has total 03 ATICs under the jurisdictions of Bihar Agricultural University (BAU) Sabour, Dr. Rajendra Prasad Central Agricultural University (DRPCAU) Pusa in Bihar and Birsa Agricultural University (BAU) Ranchi in Jharkhand. Offering technological products and technical guidance, these ATICs were visited by 3967 farmers. A total of 41580 agro-advisory visits were made by the farmers to the ATICs. 3648 farmers in Bihar and 280 farmers in Jharkhand were able to access technology information through the Kisan Call Center, which included information on improved hybrid varieties, agro-techniques, soil and water conservation, value addition, pest and disease control, and animal husbandry, including fisheries. Furthermore, the ATIC in this zone is a potential source for technological quality products to the farmers, such as seed (10781 q), planting materials (232600 nos.), poultry birds (18200 nos.), bio products (4502.63), fish fingerlings (510000 nos.), livestock (726 nos.), bio fertilizer (32481 nos.), earthworms (25000 nos.), fertilized poultry eggs (250 nos.), vermi-compost (2450 q), bakery products (786 nos.), farm implements (218 nos.), processed products (6) and 2538 number of publication were sold out during the reporting period.

Table 00: Details of technology products provided by ATICs

Sl.	Particulars	Quantity of Products	Total No. of Farmers
1.	Seeds (q)	10781	13136
2.	Planting materials (Nos.)	232600	
3.	Livestock (Nos.)	726	
4.	Poultry birds (Nos.)	18200	
5.	Bio-products (q)	4502.63	
6.	Bio-fertilizers (Nos.)	32481	
7.	Fish seed/ fingerlings (Nos.)	510000	
8.	Fertilized poultry eggs (Nos.)	250	
9.	Barkery Products (Nos.)	786	
10.	Earthworms (Nos.)	250000	
11.	Farm implements (Nos.)	218	
12.	Processed products (Nos.)	6	
13.	Vermi-compost (q)	2450	
14	Others (Publication sale) (Nos.)	2538	

The ATIC also offers various facilities and services to the farming community. During the reporting year, soil health cards were issued to 33649 number of farmers. Apart from this the soil and water testing facility were also provided to 11025 farmers. Animal diagnostic visits was made to 17309 number of farmers along with 13973 no. of case treated. 3967 farmers visited to ATIC and 3928 farmers utilized the Kisan Call Centre facility and 3435 farmers received kisan mobile advisory through ATIC.

Table 00: Details of technology services provided by ATICs

Sl.	Particulars	Total No. of Farmers
1.	Soil and water testing	11025
2.	Plant diagnostics	1710
4.	No. of case treated	13973
5.	Animal diagnostic visits/treatment	17309
6.	Agro/Veterinary Advisory Services	41580
7.	Special Extension programme	267
8.	Farmers visited ATIC	3967
9.	Mechanization Planning Advisory	55
10.	Soil Health Cards issued & Farmers' training conducted in KVKs & NGOs (No.)	33649
11.	No. of technologies on freshwater aquaculture (hatchery management, grow out culture and post -harvest technology)	6
12.	Through Kisan Call Centre (No.)	3928
13.	Through Letters (No.)	5
14.	KCC Services (No.)	490
15.	Kisan Mobile Advisory (No.)	3435
16.	Others if any	9
TOTAL		131674

Technological Backstopping by Directorates of Extension Education

The Directorate of Extension Education (DEE) supports all 68 KVKs of ATARI, Zone IV by providing technological support and inputs from various Agriculture universities. In 2023, 96 workshop/meeting organized by four DEE of SAUs of Zone IV (Table 00) and visits made by DEE in different particulars activities like training programme (115 no.), farm development programmes (76 no.), SAC meetings (49 no.), Field days, Monitoring of interventions (27 no.) etc. are given in details in below Table 00. Overseeing of KVKs activities by DEEs during this year, OFT (350 no.), FLD (413 no.), Field days (394 no.), Diagnostic visits (3280 no.) were organized. A total no. of 4510 activities were held (Table 00). During this year, 18 publications including technology inventory, KVK at a glance, Kisan Mela Souvenir, Extension bulletin and others were published by different Directorates (Table 00). Along with this, major technological products were also made available to KVKs through DEE such as fish seed (510000 no.), soil water testing (3280 no.) poultry products (1017 no.), bio-products (50 no.), analysis of fecal samples (120 no.), research reports, extension booklets and leaflets, documentary films provided, Nursery Kit etc. as mentioned in the Table.

Table 00: Workshop/Meetings organized by DEEs: -

SAUs/CAUs	Total No. of workshop/ meeting organized by DEEs
Bihar Agricultural University, Sabour	64
DRPCAU, Samastipur	16
Birsa Agricultural University, Ranchi	14
BASU, Patna	02
TOTAL	96

A. Visits made by DEE/Officials of the Directorate to KVKs

Particulars	No. of visits				Total No. of Visits
	BAU, Sabour	DRPCAU, Samastipur	BAU, Ranchi	BASU, Patna	
SAC meetings	16	13	19	1	49
Field days	11	6	12	1	30
Workshops / Seminars	6	4	9	0	19
Technology week	1	0	8	1	10
Training programmes	70	13	26	6	115
Kisan Mela	1	5	7	1	14
Inaugration of Administrative Building	0	1	0	0	1
Monitoring of interventions	12	5	9	1	27
Farm Development Programmes	28	41	3	4	76
Rabi and kharif campaign	2	0	0	0	2
World soil day programme	1	1	2	0	4
Others	66	66	12	0	144
TOTAL	214	155	107	15	491

B.Overseeing of KVKs activities by DEEs:

Particulars	No. of visits				Total No. of visits
	BAU Sabour	DRPCAU, Samastipur	BAU, Ranchi	BASU, Patna	
On Farm Trials	154	139	55	2	350
Front Line Demonstration	176	168	65	4	413
Kisan Goshties	293	277	18	1	589
General Monitoring	4	0	8	2	14
Field days	235	140	18	1	394
Diagnostic visits	1126	1597	11	0	2734
Any other (Farmers interface meeting, Conference)	6	2	8	0	16
TOTAL	1994	2323	183	10	4510

C. Publication by DEEs:

Particulars	BAU Sabour	DRPCAU, Samastipur	BAU, Ranchi	BASU, Patna	Total
Directorates published the technological inventory	4	1	1	1	7
KVK at a glance (Pathari Krishi)	1	2	1	1	5
Kisan Mela Souvenir	1	1	0	0	2
Extension Bulletin	1	1	0	0	2
Others	1	1	0	0	2
TOTAL	8	6	2	2	18

D. Major Technological Products provided to KVKs

Major technological products	No. of KVKs				Total No. of KVKs
	BAU Sabour	DRPCAU, Samastipur	BAU, Ranchi	BASU, Patna	
Planting materials/ Seeds	22	16	8	0	46
Bio-products	22	16	12	0	50
Livestock breed	4	0	2	0	6
Livestock products	4	0	0	0	4
Poultry breed	9	8	1	0	18
Poultry products	9	8	0	1000	1017
Nursery Kit	22	10	0	0	32
Weighing Machine	18	12	0	0	30
Packaging Machine	2	9	0	0	11
Analysis of fecal samples	0	0	120	0	120
Banana Chips Maker	0	6	0	0	6
Soil/water/leaf testing	18	16	3246	0	3280
Livestock feed (Use of region -specific supplemented mineral mixture in concentrated feed)	2	0	0	0	2
Mushroom spawn	26 q	0	12 q	0	24 q
Pheromone trap	12	0	0	0	12
Apiary unit	2	5	2	0	9
Fish seed	450000	0	60000	0	510000
HRD programmes on technology advancement	22	10	3	1	36
Research reports, Extension booklets & leaflets, Documentary films provided	21	16	6	0	43

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