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ANNUAL REPORT

2013 -14

Zonal Project Directorate, Zone-II
Indian Council of Agricultural Research
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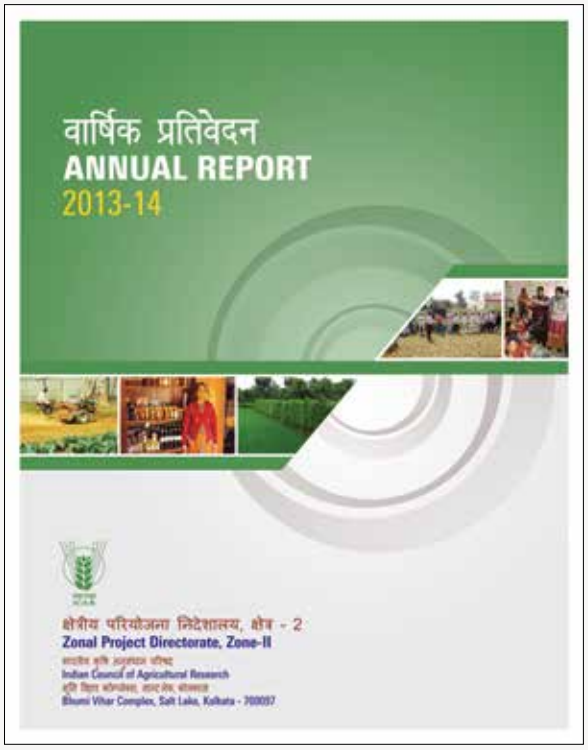

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Preface

A K Singh

Greetings from Zonal Project Directorate, Zone II

The year 2013-14 has been a momentous one for the ZPD, Zone II. The directorate moved to its permanent address with the taking over of newly constructed administrative building. A record number of awards (17) were won by KVKs during which include prestigious National Best KVK Award of ICAR; Krishi Karman Award of Department of Agriculture and Cooperation, Government of India. With two new KVKs established in this year, the total number of KVKs operating in this zone stands at 82.

This year also marked strengthening our partnership with International Centre for Agricultural Research in Dryland Areas (ICARDA), Cereal System Initiative for South Asia (CSISA), International Plant Nutrition Institute (IPNI), Directorate of Wheat Research (DWR) and Project Directorate on Farming Systems Research (PDFSR). The Zonal Project Directorate, Zone- II is entrusted with the responsibility to implement the project National Initiative on Fodder Technology Demonstration (NIFTD) involving 100 KVKs in association with IGFRI, Jhansi.

The Directorate in association with Plant Protection Varieties and Farmers' Rights Authority (PPV&FRA) organized sensitization workshops on plant protection and farmers' rights in as many as 24 KVKs to create awareness among the farmers for registering indigenous crops/varieties. This has resulted in more than 750 crops/ varieties having been identified for registration.

Towards restoration of livelihood of Bali islanders, affected by cyclone *aila,* the Directorate initiated a major work involving CIARI, Port Blair and ICAR Complex for NER, Barapani. Tribal Sub Plan activities are carried out in 12 KVKs having sizable tribal population. The KVKs of Zone-II are actively using the National Farmers Portal for providing need-based advisory services/ information.

I am grateful to the Secretary, DARE and Director General, ICAR, Dr S. Ayyappan for his constant guidance and motivation. Thanks are due to Dr. K D Kokate, DDG (AE.) and Dr. V. Venkatsubramanian, ADG (AE) for their constant support and guidance. Support received from Programme Coordinators, host organizations, my colleagues at the Directorate is thankfully acknowledged.

Kolkata
10.06.2014

A K Singh
Zonal Project Director

Contents


প্রযুক্তি সপ্তাহ

विशिष्ट सारांश

क्षेत्रीय परियोजना निदेशालय तथा संघशासित प्रदेश अंडमान एवं निकोबार द्वीपसमूह और बिहार, झारखंड तथा पश्चिम बंगाल राज्यों में फैले हुए क्षेत्रीय परियोजना निदेशालय के तहत संचालित 82 कृषि विज्ञान केन्द्रों की कार्यक्षमता के मूल्यांकन में पाया गया कि यहां चल रहे अनुसंधान एवं विस्तार कार्यों पर समान रूप से जोर दिया गया है। नियमित और निरंतर निगरानी, दौरों, खेत पर तुरंत आकलन के साथ–साथ निगरानी कार्यों के माध्यम से कृषि विज्ञान केन्दों के अधिदेशित कार्यकलापों की पूर्ति को सुनिश्चित करने के साथ–साथ अनेक अनुसंधान कार्यकलापों को शामिल करते हुए कृषि विज्ञान केन्द्रों की संभावित क्षमता को अनुसंधान प्रयासों के रूप में प्रसारित किया गया। अनेक अनुसंधान संस्थानों जैसे अंतर्राष्ट्रीय बारानी क्षेत्र कृषि अनुसंधान केन्द्र (आईसीएआरडीए), दक्षिण एशिया अनाज प्रणाली पहल (सीएसआईएसए), अंतर्राष्ट्रीय पादप पोषण संस्थान (आईपीएनआई), पीडी – ए.डी.एम.ए.एस., आईवीआरआई – ईआरएस, गेहूं अनुसंधान निदेशालय (डीडब्ल्यूआर) तथा कृषि प्रणाली अनुसंधान परियोजना निदेशालय (पीडीएफएसआर) के साथ सहयोगी अनुसंधान कार्य किए गए। इनसे कृषि विज्ञान केन्द्र सिर्फ प्रौद्योगिकी अनुप्रयोग के नवीनतम क्षेत्रों में कार्य करने में सक्षम ही नहीं हुए बल्कि राष्ट्रीय और अंतर्राष्ट्रीय संस्थानों ने अनेक सूक्ष्म कृषि स्थितियों के अंतर्गत खेत अनुप्रयोग के परिप्रेक्ष्य में अपनी प्रौद्योगिकियों की संभावित क्षमता को भी समझा है।

15 चिन्हित किए गए कृषि विज्ञान केन्द्रों द्वारा 'राष्ट्रीय कृषि जलवायु प्रतिस्कंदी पहल' नामक परियोजना को नियमित रखने से फसल उत्पादन, पशुपालन, चारा उत्पादन, जल संग्रहण तथा प्रतिकूल जलवायु स्थितियों के लिए प्रबंधन से संबंधित अनेक प्रौद्योगिकियों को मानकीकृत किया गया। ग्राम जलवायु जोखिम प्रबंधन समिति के गठन तथा कस्टम हायरिंग केन्द्रों की स्थापना से जलवायु के प्रति संवेदनशील किसानों को प्रौद्योगिकी तथा तकनीकी दक्षता से अधिक सक्षम व सुसज्जित बनाने के लिए नई और परीक्षण की गई प्रौद्योगिकियों के प्रक्रियाबद्ध कार्यान्वयन, कृषि के आधुनिक औजार और उपकरणों के उपयोग, प्राकृतिक संसाधन प्रबंधन तथा मानव संसाधन विकास में अधिक वृद्धि हुई है। पिछले एक वर्ष के दौरान मुख्य उपलब्धियों में टैंक एवं कुंआ सिंचाई प्रणाली द्वारा कुशल जल प्रबंधन, एकत्रित जल के रिसाव को कम करना, भू–जल के स्तर में वृद्धि के साथ–साथ भंडारण क्षमता, लघु अवधि वाली फसल किस्मों जैसे मूंग की सफलतम खेती, खीरा और सेम (बीन्स) का लाभकारी अंतःफसलीकरण, पानी की कम जरूरतवाली फसलों जैसे उड़द और तिल को लोकप्रिय बनाना, पशुधन में पराजीवी संक्रमण को कम करना और अन्य कार्य शामिल हैं। एनआईसीआरए के तहत ग्राम जलवायु जोखिम प्रबंधन समिति के किसानों के बीच नियमित रूप से सामूहिक बैठकों का आयोजन, प्रशिक्षण, ज्ञानवर्धक दौरों के आयोजन के माध्यम से व्यापक स्तर पर जागरूकता बढ़ाने का सशक्त माध्यम है। इसी प्रकार कस्टम हायरिंग केन्द्र रु. 5.60 लाख की पर्याप्त राशि के सृजन से किसानों को सस्ते दामों पर कृषि उपकरण और औजार मुहैया कराने में सफल होंगे।

पिछले तीन वर्षों के दौरान एनआईसीआरए के कार्यान्वयन के अनुरूप भारतीय कृषि अनुसंधान परिषद् ने देश में 100 कृषि विज्ञान केन्द्रों के माध्यम से "राष्ट्रीय चारा प्रौद्योगिकी प्रदर्शन (एनआईएफटीडी) पहल" नामक एक और अग्रणी कार्यक्रम आरंभ किया है। इस परियोजना के कृषि विज्ञान केन्द्रों तथा आईजीएफआरआई/आईसीएआर के बीच समन्वय स्थापित करने की जिम्मेवारी क्षेत्रीय परियोजना निदेशालय, क्षेत्र (जोन)–II को सौंपी गई है। निर्धारित उद्देश्यों को हासिल करने के लिए क्षेत्रीय परियोजना निदेशालय ने इस कार्यक्रम को सफल बनाने के लिए कृषि विज्ञान केन्द्रों के चयन, विशिष्ट प्रशिक्षण कार्यक्रम के आयोजन, बीज/स्लिप की जरूरतों की पूर्ति के साथ–साथ अन्य क्षेत्रीय परियोजना निदेशालयों को शामिल करते हुए योजना और कार्यान्वयन में समस्त जरूरी पहल की हैं। आईजीएफआरआई, एमपीकेवी तथा बीसीकेवी (कल्याणी) में तीन चरणों में प्रशिक्षण कार्यक्रम पूरा करने और प्रौद्योगिकी मॉड्यूल विकसित करने के बाद कृषि विज्ञान केन्द्रों (92) द्वारा किसानों के खेतों में चारा प्रौद्योगिकी का प्रदर्शन और के.वी.के. फार्म में चारा बीज का उत्पादन किया जा रहा है। इस अग्रणी कार्यक्रम में जोन– II के 14 कृषि विज्ञान केन्द्र सक्रिय रूप से शामिल हैं।

गेहूं और मक्का में पादप पोषण पर विशिष्ट परीक्षण करने के उद्देश्य से अंतर्राष्ट्रीय पादप पोषण संस्थान (आईपीएनआई) द्वारा विकसित पोषण प्रबंधन मॉडल को वैद्यीकरण के लिए आईपीएनआई के साथ सहयोग कार्यक्रम आरंभ किया है। इस क्षेत्र (जोन) के 25 कृषि विज्ञान केन्द्रों द्वारा पिछले वर्ष के उतरोत्तर अवधि में अनुसंधान कार्यक्रम आरंभ किया गया है।

पश्चिमी बंगाल में पशु रोग निगरानी और सर्विलेंस (एमएसएडी) कार्य करने के लिए पीडी–एडीएमएएस के साथ सहयोगी कार्यक्रम द्वारा पशु रोग की निगरानी की जरूरत को पूरा किया गया इसमें पश्चिम बंगाल के 13 कृषि विज्ञान केन्द्रों को जिले में किसी प्रकार के पशु/

पोल्ट्री रोग के प्रकोप को तुरंत पीडी–एडीएमएएस, भा.कृ.अनु.प. तथा क्षेत्रीय परियोजना निदेशालय को रिपोर्ट करने की जिम्मेवारी सौंपी गई ताकि समय पर रोकथाम की कार्रवाई की जा सके। पश्चिमी बंगाल के तीन कृषि विज्ञान केन्द्र आईवीआरआई क्षेत्रीय केन्द्र, बेलगछिया, कोलकात्ता की अनुसंधान परियोजना के हिस्से के रूप में 'पशुधन का नीतिगत कृमिहरण' (डीवार्मिंग)' पर भी काम कर रहे हैं। इस अध्ययन से कृमि संक्रमण की समस्या से निपटने की गहन कार्यनीति का पता लगाने के लिए मौसम प्राचलों तथा कृमि संक्रमण के बीच परस्पर संबंध का पता लगने की आशा है। क्षेत्रीय परियोजना निदेशालय ने पश्चिमी बंगाल के उत्तरी हिस्से के लिए गेहूं की उचित किस्मों की पहचान के लिए गेहूं अनुसंधान निदेशालय के साथ सहयोग भी किया है। इस कार्यक्रम के तहत पिछले रबी मौसम के दौरान 5 कृषि विज्ञान केन्द्रों ने किस्मगत परीक्षण किए हैं और इनके परिणाम के मूल्यांकन का कार्य चल रहा है।

अनाज उत्पादकता वृद्धि के साथ–साथ संसाधन उपयोग दक्षता और आय बढ़ाने के लिए उत्पादन और फसल कटाई के बाद की प्रौद्योगिकी के व्यापक प्रसार के कार्यों को पूरा करने के लिए आईआरआरआई, फिलीपींस के तत्वावधान में 'दक्षिण एशिया के लिए अनाज प्रणाली पहल' (सीएसआईएसए) की नवोन्मेषी पहल में बिहार के 5 कृषि विज्ञान केन्द्रों को शामिल किया गया।

अंतर्राष्ट्रीय बारानी क्षेत्र कृषि अनुसंधान केन्द्र (आईसीएआरडीए) द्व ारा किए जा रहे मृदा और जल संसाधनों के कुशलतम उपयोग के साथ–साथ पारंपरिक कृषि प्रणाली में नई फसलों और फसल किस्मों को समाविष्ट करने से संबंधित कार्यों में बिहार के 3 कृषि विज्ञान केन्द्रों को शामिल किया गया है। इन पहलों के पूरा होने से पैदावार वृद्धि और पैदावार स्थिरता, पोषणता, आय और जीविका में सुधार की आशा है।

क्षेत्रीय परियोजना निदेशालय के विविधीकृत प्रयासों में 'पादप किस्म और किसान अधिकार संरक्षण प्राधिकरण' (पीपीवी एंड एफआरए), कृषि मंत्रालय, भारत सरकार के साथ पादप किस्म, किसान और पादप उत्पादकों के अधिकारों के संरक्षण के लिए प्रभावशाली प्रणाली स्थापित करने के साथ–साथ पादपों की नई किस्मों के विकास को प्रोत्साहित करने से संबंधित सहयोगी कार्यक्रम शामिल है। 'पादप और किसान अधिकार संरक्षण' विषय पर एक कार्यशाला आयोजित करने के साथ–साथ 24 कृषि विज्ञान केन्द्रों की पहचान भी की गई जो देशी फसलों/किस्मों के पंजीकरण के लिए किसानों के बीच जागरूकता सृजन का काम करेंगे। समस्त चिन्हित कृषि विज्ञान केन्द्रों ने इस अधिनियम के फायदे के बारे में किसानों को जानकार बनाने के लिए प्रशिक्षण एवं कार्यशाला कार्यक्रम आयोजित किए। इस प्रक्रिया में 750 से ज्यादा फसलों/किस्मों की पहचान पंजीकरण के लिए की गई है।

अनुसंधान कार्यों को सुदृढ़ करने के अलावा क्षेत्रीय परियोजना निदेशालय बाली द्वीपसमूह, सुंदरबन, दक्षिण 24 परगना के निवासियों की मानव संसाधन जीविका तथा उनके जीवन स्तर में व्यापक सुधार लाने की दिशा में भी कार्य कर रहा है। एक मुख्य (नोडल) संस्थान होने के कारण निदेशालय के निवासियों के संसाधनों को आकलन करने के बाद अनेक किसानों, खेतिहर महिलाओं तथा युवाओं से परस्पर सम्पर्क किया। अनेक दौरे और परस्पर सम्पर्क के आधार पर सीआईएआरआई, पोर्ट ब्लेयर, देश के पूर्वी क्षेत्र में स्थित अन्य भा.कृ. अनु.प. संस्थानों के साथ सामंजस्य से विकास की एक व्यापक योजना तैयार की गई जिसे कृषि विज्ञान केन्द्र नीमपीठ द्वारा कार्यान्वित किया गया। बाद में बाली द्वीप के विकास के लिए भा.कृ.अनु.प. पूर्वोत्तर क्षेत्र अनुसंधान परिसर द्वारा सहायता प्रदान की गई। विभिन्न उपभोक्ता वर्ग के लिए अनेक प्रशिक्षण कार्यक्रमों का आयोजन किया गया जिसमें जरूरी कृषि इनपुट और उपकरण उपलब्ध कराए गए।

अधिदेशित कार्यकलापों से संबंधित उपलब्धियों के संदर्भ में क्षेत्र (जोन)–II के तहत 82 कृषि विज्ञान केन्द्रों ने सभी क्षेत्रों में अपने लक्ष्यों को पूरा किया है। प्रौद्योगिकी मूल्यांकन और परिष्करण के क्षेत्र में कृषि विज्ञान केन्द्रों ने किसानों द्वारा बार–बार झेली जा रही कृषि समस्याओं के समाधान का पता लगाने के लिए 6250 अलग–अलग स्थानों में 649 खेत परीक्षण आयोजित किए। विभिन्न विषयपरक क्षेत्रों में कृषि विज्ञान केन्द्रों द्वारा जिनमें सबसे ज्यादा खेत परीक्षण किए गए उन मुख्य क्षेत्रों में समेकित फसल प्रबंधन, समेकित पोषण प्रबंधन, समेकित नाशीजीव प्रबंधन, समेकित रोग प्रबंधन, किस्मगत आकलन, संसाधन संरक्षण प्रौद्योगिकी, पशुधन उत्पादन और प्रबंधन, पशुधन में पोषण प्रबंधन, मात्स्यिकी, मछली में रोग प्रबंधन, उद्यमशीलता विकास शामिल है। विभिन्न प्रौद्योगिकियों के मूल्यांकन से अनेक उचित प्रौद्योगिकियों का पता लगाया गया है जैसे चावल उत्पादकता वृद्धि के लिए उपरांऊ भूमि में बीएसआर प्रणाली, सब्जी उगाने के लिए स्वस्थ पौद के लिए मध्यम स्तर तक वृद्धि, मूंग की समक्रमिक परिपक्व किस्म की पहचान, कृषि विज्ञान केन्द्र जिले के लिए आशाजनक फसलीय प्रणाली, बैंगन की मुरझान प्रतिरोधी किस्म आदि इन्हें किसानों द्वारा व्यापक स्तर पर अपनाया गया है।

अग्रपंक्ति प्रदर्शनों में कृषि विज्ञान केन्द्रों द्वारा खेतों में नवीनतम किस्मों/प्रौद्योगिकियों की क्षमता का प्रदर्शन किया गया। इन प्रदर्शनों

में फसल, पशुधन, उद्यम, उपकरण और अन्य शामिल थे। यद्यपि मुख्य रूप से खरीफ और रबी मौसम दोनों की मुख्य तिलहन तथा दलहन फसलों पर ज्यादा बल दिया गया। खरीफ की तिलहन फसलों जैसे मूंगफली, रामतिल, सोयाबीन और तिल का प्रदर्शन किया गया जबकि रबी के दौरान सरसों, तोरिया, सुरजमुखी, अलसी, तिल, मूंगफली तथा अरंड का प्रदर्शन किया गया। खरीफ तिलहन के तहत 99.7 हेक्टे. क्षेत्र और रबी के तहत 741.8 हेक्टे. क्षेत्र को शामिल किया गया। रबी मौसम में 3043 किसानों की तुलना में खरीफ तिलहन प्रदर्शन में 592 किसानों को शामिल किया गया। खरीफ तिलहन में औसत पैदावार वृद्धि 33.3 से 61.4 प्रतिशत तथा रबी तिलहन में 19.3 से 85.8 प्रतिशत थी। इसी प्रकार, प्रदर्शन के तहत खरीफ दलहन में 308.9 हेक्टे. क्षेत्र था जिसमें 1467 किसान शामिल थे रबी में 737.0 हेक्टे. क्षेत्र था जिससे 2577 किसान लाभान्वित हुए। खरीफ दलहन में औसत पैदावार वृद्धि 20.0 से 190.0 प्रतिशत थी जबकि रबी दलहन में 21.5 से 38.5 प्रतिशत थी। चयनित तिलहन तथा दलहन फसलों के अलावा अन्य फसलों, सब्जियों, मसालों आदि में 15915 प्रदर्शन किए गए जिसमें 4869.9 हेक्टे. क्षेत्र शामिल था। समस्त प्रदर्शन कार्यक्रमों में दर्ज की गई औसत पैदावार स्थानीय चैक से ज्यादा होने के साथ–साथ इसका लाभ–लागत अनुपात भी अधिक था।

तीन क्लांइटेल वर्गों नामतः कार्यरत किसानों, ग्रामीण युवाओं तथा विस्तार कार्यकरण के लिए उन्नत मानक संसाधन में उपलब्धि हासिल की गई। साथ ही कृषि विज्ञान केन्द्र ने बेहतर कार्यक्षमता का प्रदर्शन किया। कुल मिलाकर 7532 पाठ्यक्रम आमंत्रित किए गए जिसमें 220583 कार्यरत किसानों ने हिस्सा लिया इसमें खेतिहर महिलाएं भी शामिल हैं, 49857 ग्रामीण युवाओं के लिए 1960 पाठ्यक्रम तथा 30212 विस्तार कार्यकर्ताओं के लिए 1030 पाठ्यक्रम आमंत्रित किए गए। कार्यरत किसानों के लिए शामिल किए गए मुख्य क्षेत्रों में फसल उत्पादन, बागवानी, पादप संरक्षण, महिला सशक्तिकरण पशुधन उत्पादन और प्रबंधन, मृदा स्वास्थ्य तथा उपजाऊपन प्रबंधन, कृषि अभियांत्रिकी, क्षमता निर्माण तथा समूह डायनामिक्स, मात्स्यिकी, खेत में इनपुट उत्पादन, कृषिवानिकी और अन्य क्षेत्र शामिल हैं। ग्रामीण युवाओं के संदर्भ में खुम्बी उत्पादन, बीज उत्पादन, केंचुआ पालन, कुक्कट उत्पादन, उद्यमशीलता विकास, सिलाई और बुनाई, समेकित कृषि, जैविक उत्पादों का उत्पादन, कृषि मशीनरी तथा उपकरणों की मरम्मत और रख–रखाव, मूल्यवर्धन आदि मुख्य क्षेत्र शामिल हैं जबकि विस्तार कार्यकर्ताओं के संदर्भ में फसलों की उत्पादकता वृद्धि, समेकित नाशीजीव प्रबंधन, समेकित पोषण प्रबंधन, संरक्षित खेती प्रौद्योगिकी, कृषि मशीनरी और उपकरणों की देखभाल और रख–रखाव, कृषि पशुओं का प्रबंधन, घरेलू खाद्य सुरक्षा जैविक उत्पादों का उत्पादन और उपयोग जैसे महत्वपूर्ण क्षेत्र शामिल हैं। इसके अलावा कृषि विज्ञान केन्द्रों ने प्रायोजित प्रशिक्षण कार्यक्रमों के रूप में 2777 पाठ्यक्रम आयोजित किए जिससे 74687 प्रतिभागी लाभान्वित हुए। मुख्य क्षेत्रों में फसल उत्पापदन और प्रबंधन, उत्पादन और मूल्यवर्धन, सस्योत्तर प्रौद्योगिकी तथा मूल्यवर्धन, कृषि मशीनरी, पशुधन और मात्स्यिकी, गृह विज्ञान और कृषि विस्तार जैसे कार्य शामिल किए गए। लंबी अवधि वाले पेशेवर प्रशिक्षण कार्यक्रम प्रदान करना कृषि विज्ञान केन्द्रों का मुख्य कार्य था जिसमें 11727 प्रतिभागियों को प्रशिक्षित करने के लिए 2501 पाठ्यक्रम आयोजित किए गए। इन कार्यक्रमों से 2077 युवाओं को स्व–रोजगार में मदद मिली जबकि 156 व्यक्तियों को दूसरी जगह रोजगार प्राप्त हुआ।

कृषि विज्ञान केन्द्रों ने वैज्ञानिक कृषि, पशुधन, मात्स्यिकी तथा अन्य संबद्ध क्षेत्रों के बारे में किसानों के बीच जागरूकता सृजन हेतु और पहुंच बढ़ाने के लिए विभिन्न विस्तार कार्यकलापों का उचति उपयोग किया। इस क्षेत्र (जोन) में कुल मिलाकर 115984 अलग–अलग विस्तार कार्यकलाप किए गए जिससे 684166 किसान और विस्तार कार्मिक लाभान्वित हुए। मुख्य कार्यकलापों में किसान गोष्ठी, किसानों का कृषि विज्ञान केन्द्र दौरा, नैदानिक दौरे, फिल्म–शो, किसान मेला, आदि शामिल थे। इनमें किसानों ने बड़ी संख्या में हिस्सा लिया।

कृषि विज्ञान केन्द्रों द्वारा केवीके फार्म और ग्राम बीज उत्पादन कार्यक्रम के अंतर्गत किसान प्रतिभागी पद्धति में, दोनों तरह से, बीज उत्पादन का कार्य किया गया। इस प्रक्रिया में कृषि विज्ञान केन्द्रों द्व ारा अनाज, तिलहन, दलहन, व्यवसायिक फसलें, सब्जियां, पुष्प आदि के 118275.2 क्विं. बीजों का उत्पादन किया गया। कृषि विज्ञान केन्द्रों द्वारा 64561 किसानों को बीज वितरण किया गया। फसलों में, कुल बीज उत्पादन में धान बीज का उत्पादन 59.4 % था इसके बाद गेहूं और मक्के के बीज का उत्पादन था। रोपण सामग्री उत्पादन में कृषि विज्ञान केन्द्रों ने फल, सब्जी, औषधीय और संगधीय पादप, मसाले, जंगली प्रजातियां, सजावटी पादप आदि की 3180124 रोपण सामग्री का उत्पादन किया। उपयोग के लिए 111012 किसानों को रोपण सामग्री प्रदान की गई।

जैव उत्पाद तथा पशुधन उत्पादन दो अन्य क्षेत्र थे जहां कृषि विज्ञान केन्द्रों ने 1339882.2 कि.ग्रा. जैव उर्वरक; जैव एजेंटों आदि तथा 1034585 पशुधन सहित ब्रायलर, इंडियन कार्प, लेयर आदि का उत्पादन किया।

क्षेत्र (जोन)– II के कृषि विज्ञान केन्द्रों द्वारा मृदा एवं जल नमूनों का

विश्लेषण एक अन्य क्षेत्र था जिसमें 27476 नमूनों का विश्लेषण किया गया। इस प्रक्रिया में 2170 गांवों के 19778 किसान लाभान्वित हुए जबकि कृषि विज्ञान केन्द्रों द्वारा रु. 503480 की राशि अर्जित की गई।

वैज्ञानिक सलाहकार समिति की बैठक के आयोजन को व्यवस्थित किया गया तथा कुल मिलाकर इस तरह की लगभग 76 बैठकों का आयोजन किया गया जिसमें 2425 एसएसी सदस्यों तथा अन्य आमंत्रित सदस्यों ने हिस्सा लिया। सभी बैठकों में कृषि विज्ञान केन्द्रों के निष्पादन, कार्रवाई योजना तथा जरूरी सहायता के बारे में विस्तृत विचार–विमर्श किया गया।

विभिन्न अनुसंधान और विस्तार कार्यकलापों में कृषि विज्ञान केन्द्रों के शामिल होने से यह 154 अनुसंधान शोध पत्र, 318 बुलेटिन, 312 विस्तार पत्रिकाओं/साहित्य, 90 तकनीकी रिपोर्टें, 81 लोकप्रिय लेख आदि प्रकाशित करने में सक्षम हुआ है। कृषि विज्ञान केन्द्रों ने सम्मेलन/संगोष्ठियों/सिम्पोजिया आदि में 70 शोध पत्र भेजे हैं।

सार्वजनिक–निजी सहभागिता द्वारा ज्यादातर सभी कृषि विज्ञान केन्द्रों में प्रौद्योगिकी सप्ताह के आयोजन से काफी अधिक संख्या में किसानों को कृषि विज्ञान केन्द्रों के निकट और प्रत्यक्ष सम्पर्क में आने का मौका मिला और उन्हें आधुनिक कृषि और संबद्ध प्रौद्योगिकियों के लाभों के बारे में जानकारी प्राप्त हुई। प्रौद्योगिकी सप्ताह के दौरान आयोजित मुख्य कार्यकलापों में गोष्ठी, विशेष व्याख्यान, प्रदर्शन, फिल्म शो, सम्मेलन, सामूहिक विचार–विमर्श आदि शामिल थे। प्रौद्योगिकी सप्ताह के दौरान कुल मिलाकर 397 विभिन्न कार्यक्रम आयोजित किए गए जिसमें 129203 किसानों और अन्य वर्गों ने हिस्सा लिया।

विस्तार शिक्षा निदेशालय द्वारा प्रदान की गई प्रौद्योगिकीय सहायता और क्षेत्रीय निदेशालय स्तर पर आयोजित एचआरडी कार्यक्रम से कृषि विज्ञान केन्द्रों द्वारा खेतों में प्रौद्योगिकी का बेहतर अनुप्रयोग सुनिश्चित हुआ। विस्तार शिक्षा निदेशालय के स्तर पर कृषि विज्ञान केन्द्रों के लिए 38 प्रशिक्षण कार्यक्रम आयोजित किए गए जबकि क्षेत्रीय परियोजना निदेशालय द्वारा इस प्रकार के 12 कार्यक्रम आयोजित किए गए। इन कार्यक्रमों से कृषि विज्ञान केन्द्र के विभिन्न श्रेणियों के 1298 कार्मिक लाभान्वित हुए।

प्रौद्योगिकी सूचना एकत्र करने, प्रौद्योगिकी उत्पाद, किसान मेला में सहभागिता तथा अन्य प्रयोजनों के लिए 52510 किसानों ने इस क्षेत्र में स्थित कृषि प्रौद्योगिकी सूचना केन्द्र (एटीआईसी) का दौरा किया। किसानों ने अपनी रुचि मुख्य रूप से नई किस्मों/फसल की संकर किस्मों, नाशीजीव प्रबंधन, रोग प्रबंधन, विभिन्न कृषि तकनीकों, मृदा और जल संरक्षण, फसल कटाई के बाद की प्रौद्योगिकी तथा मूल्यवर्धन, पशुपालन तथा मत्स्यिकी के क्षेत्र में प्रकट की। किसानों ने अपनी खेत की समस्याओं की तुलना में समाधान को ढूंढ़ने में पत्रों द्वारा पत्राचार भी किया। विक्रय प्रक्रिया के द्वारा एटीक ने रुपए 4.29 करोड़ की राशि अर्जित की। इनमें बेचे गए मुख्य उत्पादों में रोपण सामग्री, बीज, पशुधन, कुक्कट पालन वाले पक्षी, सुगंधित चावल, शिमला मिर्च, सरसों का तेल आदि शामिल हैं।

किसान मोबाइल सलाहकार सेवा के रूप में आईसीटी का प्रयोग एक अन्य क्षेत्र था जिसमें महत्वपूर्ण उपलब्धि हासिल की गई। फसल उत्पादन, पशुधन पालन, मौसम पूर्वानुमान, विपणन, जागरूकता सृजन और अन्य क्षेत्रों के संबंध में किसानों को लगभग 1651912 संदेश 334304 भेजे गए। क्षेत्र (जोन)– II के कृषि विज्ञान केन्द्रों में राष्ट्रीय किसान पोर्टल में किसानों के नाम दर्ज किए गए जिससे इस पोर्टल द्वारा जरूरत आधारित सलाहकार सेवाएं/सूचनाएं प्रदान की जा रही हैं।

जनजातीय वर्ग के लोगों के विशेष विकास के लिए जनजातीय उपयोजना को कार्यान्वित करने के लिए 12 कृषि विज्ञान केन्द्रों की पहचान की गई और उन्हें रुपए 55.0 लाख की राशि की सहायता उपलब्ध की गई। टी.एस.पी. के तहत किए गए कुछ कार्यकलापों में किसान प्रशिक्षण, बीज उत्पादन, रोपण सामग्री का उत्पादन, पशुधन नस्ल तथा फिंगरलिंग उत्पादन, मृदा और जल नमूनों का परीक्षण, मोबाइल कृषि सलाहकार सेवाएं आदि शामिल हैं।

विभिन्न राज्य/केन्द्र के संगठनों, कार्यक्रमों, योजनाओं, वित्तीय संस्थानों और अन्य के साथ सहयोग और सामंजस्य से कृषि विज्ञान केन्द्रों को पर्याप्त मात्रा में आय सृजन के साथ–साथ बुनियादी ढांचे की सहायता में मदद मिली है। कृषि विज्ञान केन्द्रों ने अन्य संगठनों को प्रौद्योगिकी विशेषज्ञता प्रदान करते हुए रुपए 10.93 करोड़ के अतिरिक्त संसाधन का सृजन किया है।

क्षेत्रीय परियोजना निदेशालय के स्तर पर हासिल की गई उपलब्धियों का उल्लेख अनुसंधान शोध पत्रों, सार, पुस्तक/पुस्तक अध्याय, तकनीकी बुलेटिन/रिपोर्टों आदि के द्वारा किया जाता है।

क्षेत्रीय परियोजना निदेशालय द्वारा किए गए प्रयासों की भारतीय कृषि अनुसंधान परिषद् के उच्च प्राधिकारियों ने सराहना की है और इस जोन के दक्षिण 24 परगना (निम्पिथ) स्थित कृषि विज्ञान केन्द्र को राष्ट्रीय स्तर के उत्कृष्ट कृषि विज्ञान केन्द्र पुरस्कार प्रदान कर उसे सम्मानित भी किया है। इसी प्रकार से, किसान समुदाय के लिए कृषि

विज्ञान केन्द्रों द्वारा किए गए अथक प्रयास व श्रम के लिए संबंधित राज्यों सरकारों तथा अन्य निजी संगठनों द्वारा उन्हें विभिन्न पुरस्कार दिए जाते हैं, जैसे कृषक सम्मान, कृषि रत्न, श्रेष्ठ उन्नत किसान, श्रेष्ठ अनुसंधानकर्ता, श्रेष्ठ सफल युवा कृषि उद्यमी, कृषि कर्मण्य, महिन्द्रा समृद्धि, एग्री अवार्ड और अन्य पुरस्कार शामिल हैं। इससे किसान न केवल और अधिक प्रगतिशील होने के लिए प्रोत्साहित होते हैं, अपितु विकास कार्यकलापों पर ज्यादा ध्यान देने के लिए कृषि विज्ञान केन्द्र भी प्रोत्साहित होते हैं।

वर्ष 2013–14 की अवधि के प्रारंभ में क्षेत्रीय परियोजना निदेशालय के नये प्रशासनिक भवन का निर्माण पूरा करवाया जाना और इसे भारतीय कृषि अनुसंधान परिषद् के अंतर्गत करना एक मुख्य उपलब्धि थी जो लगभग 35 साल के बाद पूरी हुई। यह कार्य वर्तमान और पूर्व सचिव (डेयर) एवं महानिदेशक भा.कृ.अनु.प., उपमहानिदेशक भा. कृ.अनु.प. और अन्य गणमान्य व्यक्तियों के सहयोग से सम्पन्न हुआ। कृषि और अन्य कार्यों पर समाधान उपलब्ध कराने के लिए एक विशेष नवोन्मेषी अनुसंधानकर्ता बैठक आयोजित की गई जिसमें अतिथियों को नवोन्मेषी क्षमताओं का प्रदर्शल दिखाया गया। इनमें से कुछ नवोन्मेषी कार्यों को पिछले एक वर्ष में दो बार राष्ट्रीय स्तर पर सम्मानित भी किया गया है। संस्थान प्रबंध समिति की बैठक का आयोजन किया जाना तथा उसमें कृषि विज्ञान केन्द्र और क्षेत्रीय परियोजना निदेशालय से संबंधित मुद्दों को शामिल किया जाना भी एक मुख्य उपलब्धि है। क्षेत्रीय परियोजना निदेशालय द्वारा परियोजना निदेशालय और कृषि विज्ञान केन्द्र के समस्त कार्मिकों को सूचना, जानकारी और बुनियादी सहायता उपलब्ध करने का प्रयास किया गया है जिससे वे कृषि और अन्य क्षेत्रों में किसी भी चुनौती व प्रत्याशित स्थिति का सामना करने में सक्षम हो सकें। क्षेत्रीय परियोजना निदेशालय की समग्र सफलता से यह संकेत प्राप्त होता है कि निदेशालय के अथक प्रयासे तथा भा. कृ.अनु.प. की सहायता और मार्गदर्शन से निदेशालय देश के में दूसरी हरित क्रांति लाने में सार्थक भूमिका निभा सकता है।

Executive Summry

Performance appraisal of Zonal Project Directorate and 82 KVKs under the domain of Zonal Project Directorate spread across the Union Territory of A&N Islands and the states of Bihar, Jharkhand and West Bengal presents an equal thrust towards research and extension pursuit. Alongwith ensuring the fulfillment of mandated activities of the KVKs through constant and frequent supervision, visit, on the spot evaluation as well as overall monitoring, the potentiality of KVKs has also been channelized in the form of research endevaour through involvement in a number of research activities. Collaborative research carried out with International Centre for Agricultural Research in Dryland Areas (ICARDA), Cereal System Initiative for South Asia (CSISA), International Plant Nutrient Institute (IPNI), PD_ADMAS, IVRI – ERS, Directorate of Wheat Research (DWR) and Project Directorate on Farming Systems Research (PDFSR) has not only empowered the KVKs in recent areas of technology application but also the national and international institutes in understanding the potentiality of their technologies against field application under various micro-farming situation.

Continuation of the project entitled National Initiative on Climate Resilient Agriculture through 15 identified KVKs has led to standardization of a number of technologies in crop production, animal rearing, fodder production, water harvesting and management suitable for adverse climatic condition Formation of village climate risk management committee and establishment of custom hiring centres further enhanced the methodical implementation of the newer and tested technologies, utilization of modern farm tools and implements, natural resource management and human resource development to make the farmers of climatically vulnerable areas to be more equipped with technology and technical skill. The major achievements made during last one year include efficient water management through tank-cum-well system irrigation, minimization of seepage loss of harvested water, enhancement of level of ground water with higher water storage capacity, successful cultivation of short duration varieties of crops like moong, sunflower for saline condition, profitable intercropping with cucumber and beans, popularization of low water requiring crops like urd and sesame, minimization of parasitic infestation in livestock and others. The Village Climate Risk Management Committee under NICRA has been instrumental in creating large scale awareness among the farmers by convening frequent group meeting, training and organizing exposure visit. Similarly, custom hiring centres could generate a substantial amount of Rs.5.60 lakh to enable the farmers to utilize tools and implements at a nominal cost.

In the line of implementing NICRA during last three years, Indian Council of Agricultural Research has launched another flagship programme on National Initiative on Fodder Technology Demonstration (NIFTD) through 100 KVKs across the country. Zonal Project Directorate, Zone-II has been assigned the responsibility to coordinate the project between KVKs and IGFRI/ICAR. To achieve the set objectives, the Zonal Project Directorate has taken all the necessary initiatives in planning and implementing the programme through selection of KVKs, imparting specific training programme, ensuring the requirement of seeds/slips as well as involvement of other Zonal Project Directorates to make the programme a success. After completion of training programmes in three phases at IGFRI, MPKV and BCKV (Kalyani) and development of technology module, the KVKs (92 numbers) are in the process of taking up demonstration of fodder technology in the farmers' field and production of fodder seed in KVK farm. In this flagship programme 14 KVKs of Zone-II are also actively involved.

With an aim to carry out specific trial on plant nutrition in wheat and maize, collaborative programme has been taken up with International Plant Nutrient Institute (IPNI) to validate nutrient management model developed by IPNI. The research programme has been initiated in the later part of last year through 25 KVKs of this zone.

The necessity to work on surveillance of animal diseases has been fulfilled through a collaborative programme with PD_ADMAS to carry out Monitoring and Surveillance of Animal Diseases (MSAD) in West Bengal where 13 KVKs have been entrusted with the responsibility to report the incidence of any animal/poultry disease in the district to PD_ADMAS, ICAR and Zonal Project Directorate to initiate preventive measures. Three KVKs of West Bengal are also working as a part of a research project of IVRI Regional Station, Belgachia, Kolkata for Strategic Deworming of Livestock. The study is expected to find out the correlation between weather parameters and worm infestation to find out a comprehensive strategy to overcome the problem of worm infestation.

Zonal Project Directorate is also collaborating with Directorate of Wheat Research to identify suitable cultivar of wheat for northern part of West Bengal. In this programme 5 KVKs conducted varietal trial during last rabi season and are in the process of assessing the results.

In caterizing the widespread dissemination of production and post harvest technologies to increase cereal productivity, resource use efficiency as well as enhanced income, 5 KVKs

of Bihar have been involved in the initiative of Cereal System Initiative for South Asia (CSISA) at the aegis of IRRI, Philippines.

In the effort of International Centre for Agricultural Research in Dryland Areas (ICARDA) towards more efficient use of soil and water resources as well as introduction of new crops and crop varieties into traditional farming system, 3 KVKs of Bihar have been the part of this endeavour. The completion of the initiative is expected to improve yield and yield stability, nutrition, income and livelihood.

The diversified efforts of Zonal Project Directorate also included a collaborative programme with Plant Protection Varieties and Farmers' Rights Authority (PPV&FRA), Ministry of Agriculture, Govt. of India towards establishment of an effective system to protect plant varieties, the rights of farmers and plant breeders as well as to encourage the development of new varieties of plants. Alongwith organizing a sensitization workshop on plant protection and farmers' rights, 24 KVKs were also identified to create awareness among the farmers for registering indigenous crops/varieties. All the identified KVKs organized training-cum-workshop programme to enlighten the farmers towards the benefit of this act. In the process more than 750 crops/varieties could be identified for registration.

Apart from strengthening the research front, the Zonal Project Directorate has also been involved in livelihood human resource and overall living standard improvement of the dwellers of Bali Islands, Sundarbans, South 24 Parganas. As a nodal institution the resources of the dwellers were assessed followed by interaction with the large number of farmers, farmwomen and youths. Based on visit and interaction a holistic plan of development has been developed in convergence with CIARI, Port Blair, other ICAR Institutes located in the eastern part of the country for its implementation through KVK Nimpith. Later on supporting hand was also extended by ICAR Research Complex for North Eastern Region towards development of Bali Islands. A number of training programmes for different clientele groups has been organized followed by providing the needed agricultural inputs and implements.

In respect of achievements pertaining to mandated activities, 82 KVKs under Zone-II fulfilled the set target in all the areas. In technology assessment and refinement, the KVKs conducted 649 on-farm trails in 6250 different locations to find out solution against recurring agricultural problems faced by the farmers. Among various thematic areas, integrated crop management, integrated nutrient management, integrated pest management, integrated disease management, varietal evaluation, resource conservation technology, production and management of livestock, nutrient management in livestock, fishery, disease management in fish, enterprise development were the prime areas where KVKs conducted higher number of on-farm trails. Assessment of various technologies has led to finding out a number of suitable technologies like BSR system in upland for enhanced rice productivity, growing medium for healthy seedling raising of vegetables, identification of synchronous maturing variety of greengram, promising cropping system for KVK district, wilt resistant brinjal variety etc. which can be adopted by the farmers at a large scale.

In carrying out frontline demonstration, the KVKs took up latest varieties/technologies to show its potential in the farmers' field. The demonstration included crop, livestock, enterprise, implements and others. However, special emphasis was given in selected oilseed and pulse crops both in kharif and rabi season. In kharif oilseeds crops like groundnut, niger, soybean and sesame were demonstrated whereas mustard, toria, sunflower, linseed, sesame, groundnut and castor were demonstrated during rabi. An area of 99.7 ha was brought under kharif oilseeds whereas 741.8 ha could be covered during rabi season. The involvement of farmers was to the extent of 592 in kharif oilseed demonstrations against the figure of 3043 in rabi season. The average increase in yield in kharif oilseeds varied from 33.3 to 61.4 percent and 19.3 to 85.8 in rabi oilseeds. Likewise, in kharif pulse 308.9 ha was brought under demonstration through involvement of 1467 farmers and 737.0 ha was brought under demonstration in rabi for the benefit of 2577 farmers. The average increase in yield varied from 20.0 to 190.0 percent in kharif pulse whereas it was 21.5 to 38.5 percent in rabi pulse. Apart from selected oilseed and pulse crops 15915 number of demonstration were also conducted in other crops, vegetables, spices etc. for an area of 4869.9 ha. In all the demonstration programmes, the average yield was recorded higher than the local check with higher benefit cost ratio.

Achievement in improving human resources for three clientele groups namely, practicing farmers, rural youths and extension functionaries also portrays a healthy performance on the part of the KVKs. Altogether 7532 number of courses were offered to 220583 practicing farmers including farmwomen, 1960 to 49857 rural youths and 1030 to 30212 extension functionaries. The major areas covered for practicing farmers were crop production, horticulture, plant protection, women empowerment, livestock production and management, soil health and fertility management, agricultural engineering, capacity building and group dynamics, fisheries, production of inputs at site, agro-

forestry and others. In respect of rural youths, mushroom production, seed production, vermiculture, poultry production, enterprise development, tailoring and stitching, integrated farming, production of organic inputs, repair and maintenance of farm machinery and implements, value addition etc. were the major areas whereas productivity enhancement of field crops, integrated pest management, integrated nutrient management, protected cultivation technology, care and maintenance of farm machinery and implements, management in farm animals, household food security, production and use of organic inputs etc. were the important areas for extension functionaries. In addition, the KVKs also conducted 2777 number of courses as sponsored training programmes for the benefit of 74687 participants. The major areas covered were crop production and management, production and value addition, post harvest technology and value addition, farm machinery, livestock and fisheries, home science and agricultural extension. Providing long duration vocational training programme was also an integral part of KVK functioning where 2501 number of courses were organized to train 11727 participants. The programmes helped 2077 youths to become self-employed whereas 156 persons could be employed elsewhere.

The KVKs also utilized various extension activities as potential means to enhance the outreach and to create awareness among the farmers about scientific agriculture, livestock, fishery and other allied areas. In the zone as a whole 115984 different extension activities were carried out for the benefit of 684166 farmers and extension officials. Kisan gosthi, farmers visit to KVK, advisory services, scientists visit to farmers' field, soil test campaign, exposure visit, diagnostic visit, film show, kisan mela etc. were the major activities where large number of farmers took part.

Seed production by the KVKs was taken up both at KVK farm and through village seed production programme in participatory mode. In this process the KVKs produced 118275.2 q seeds of cereals, oilseeds, pulses, commercial crops, vegetables, flowers etc. The KVKs distributed the seeds among 64561 number of farmers also to meet up the seed requirement to certain extent. Among the crops, paddy seed constituted 59.4% of the total seed production followed by wheat and maize. In planting material production the KVKs produced 3180124 number of planting materials of fruits, vegetables, medicinal and aromatic plants, spices, forest species, ornamental plants etc. Planting material was also provided to 111012 number of farmers for its utilization by them.

Bio-product and livestock production were another two areas where KVKs produced 1339882.2 kg of bio fertilizer, bio agents etc. and 1034585 number of livestock including broilers, Indian carp, layers etc.

Analysis of soil and water sample by the KVKs of Zone-II was another area of higher achievement where 27476 number of samples were analyzed. In this process 19778 number of farmers of 2170 villages were benefitted whereas KVKs realized an amount of Rs.503480.

Conducting Scientific Advisory Committee meeting has been streamlined by and large with 76 number of such meeting took place with the participation of 2425 SAC members and other invitees. In all the meeting, detailed discussion about the performance of KVKs, plan of action and support needed took place.

Involvement of KVKs in various research and extension activities enabled them to publish 154number of research papers, 318 bulletins, 312 extension pamphlets/literature, 96 technical reports, 81 popular articles etc. The KVKs also sent 70 papers for seminar/conference/symposia etc.

Celebration of technology week in almost all the KVKs through public-private partnership mode enabled a large number of farmers to come in close and direct contact with KVKs as well as witness the benefit of modern agriculture and allied technologies. Gosthis, special lecture, exhibition, film show, seminar, group discussion etc. were the major activities organized during the technology week. Altogether 397 various programmes were organized during the technology week which was participated by 129203 farmers and others.

Technological backstopping provided by Directorates of Extension Education and HRD programmes organized at Zonal Project Directorate level ensured much better application of technologies in the farmers' field by the KVKs. At the level of Directorate of Extension Education 38 training programmes for the KVKs were organized whereas 12 such programmes were organized by Zonal Project Directorate. The programmes benefitted 1298 KVK personnel of different category.

Agricultural Technology Information Centre (ATIC) located in this zone were visited by 52510 farmers for collecting technology information, technology products, to participate in kisan mela and other purposes. The farmers mainly showed their interest in the areas of new variety/crop hybrid, pest management, disease management, various agro techniques, soil and water conservation, post harvest technology and value addition, animal husbandry and fishery. The farmers also communicated through letters in search of solution against their field problems. Through the sale procedure, the ATICs earned a sum of Rs.4.29 crore, the major products sold included planting materials, seeds,

livestock, poultry birds, scented rice, capsicum, mustard oil etc.

The application of ICT in the form of Kisan Mobile Advisory Service was another area of substantial achievement. As many as 1651912 messages were sent to 334304 farmers in the areas of crop production, livestock rearing, weather parameters, marketing, awareness creation and others. The KVKs of Zone-II have also registered the name of farmers in the National Farmers Portal for providing need-based advisory services/information through this portal.

For specific development of tribal people, 12 KVKs were identified to implement Tribal Sub-Plan with a fund support of Rs. 55.0 lakh. Farmers training, production of seed, production of planting material, livestock strain and fingerling production, testing of soil and water sample, mobile agro-advisory services etc. were some of the activities undertaken under TSP.

Convergence and collaboration with different state/central organizations, programmes, schemes, financial institutions and others helped the KVKs earned substantial amount of revenue as well as infrastructure support. The KVKs generated a sum of Rs.10.93 crore as additional resources through providing technological expertise to other organizations.

At the level of Zonal Project Directorate, the achievements have also been highlighted through publication of research papers, abstracts, book/book chapter, technical bulletin/ reports etc.

The efforts put forth by Zonal Project Directorate have been suitably recognized by the highest authority of Indian Council of Agricultural Research through conferring Best KVK Award at national level to KVK South 24 Pargnas (Nimpith) of this zone. Similarly, the hard work of KVKs for the development of farming community has also been compensated by respective state governments as well as other private organizations in conferring various awards like Krishak Samman, Krishi Ratna, Best Progressive Farmer, Best Innovator, Most Successful Youth Agripreneur, Krishi Karmanya, Mahindra Samriddhi, Agri Award and many more. This has not only encouraged the farmers to further prosper but also the KVKs to concentrate more and more on development activities.

The beginning of the reporting year 2013-14 witnessed the most significant achievement in the form of completion and taking over the new administrative building of this Zonal Project Directorate after a span of nearly 35 years in the gracious presence of former and present Secretaries (DARE) & Directors General (ICAR), Deputy Directors General, ICAR and many other distinguished personalities. A special innovators meet was also organized to exhibit innovations having potential to provide solution against farming and other practices before the galaxy of guests. A few of such innovations got recognition at the national level also. Conducting Institute Management Committee to take up KVK and Zonal Project Directorate related issues twice during last one year was another achievement made by this Directorate. The Zonal Project Directorate has tried to equip all the staff of Project Directorate and KVKs with information, knowledge and infrastructure support to make them prepared to face any untoward situation in agriculture and allied sector. The overall success of this Zonal Project Directorate amply indicates that with the hard work and support from ICAR, this Directorate can take a meaningful role in bringing Second Green Revolution in this part of this country.

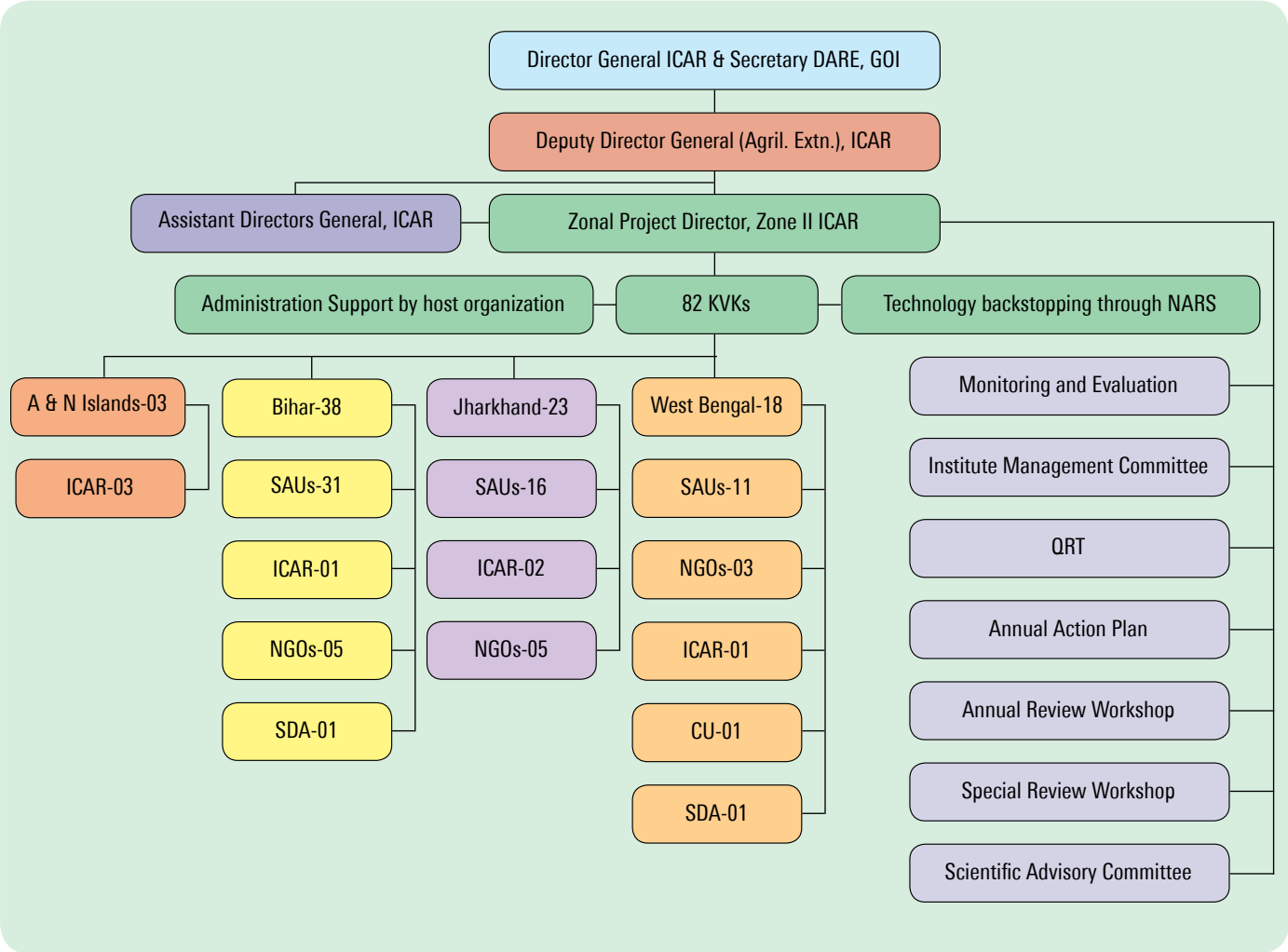
1.0 ORGANIZATIONAL STRUCTURE AND STAFF POSITION

Zonal Project Directorates come under the direct control of Division of Agricultural Extension, Indian Council of Agricultural Research, New Delhi. With the upgradation of Zonal Coordinating Units to Zonal Project Directorates, the sanctioned strength has also been increased to 19 including more scientific and administrative cadre strength.

1.1 Profile

The Division is headed by Deputy Director General (AE) under Secretary (DARE) and Director General (ICAR), having eight Zonal Project Directorates and 638 KVKs

Organizational Structure of Zonal Project Directorate- Zone II



1.2 Budget Provision

Table: Budget in respect of Zonal Project Directorate & KVKs under Zone-II during 2013-14 (Rs. in lakh)

BUDGET PROVISION													
ZPD/KVK	Recurring						Non-Recurring						Grand total
	P & A	T.A.	H.R.D	Cont.	TSP Cont.	Total	Equip. &furn	Works	Lib.	Vehicle	TSP Veh.	Total	
Zonal Project Director, Zone- II	140.00	10.00	1.50	24.00	0.00	175.50	26.00	0.00	0.00	0.00	0.00	26.00	201.50
State Agricultural University													
BAU, Sabour, Bihar (20)	1128.84	15.55	8.85	207.25	0.00	1360.49	7.00	91.10	0.00	0.00	0.00	98.10	1458.59
RAU, Pusa, Bihar (11)	386.44	8.50	5.50	113.70	0.00	514.14	0.00	0.00	0.00	0.00	0.00	0.00	514.14
BAU, Ranchi, Jharkhand (16)	628.94	11.80	0.00	151.75	32.00	824.49	1.50	0.00	0.00	8.00	8.00	17.50	841.99
UBKV, Coochbehar, West Bengal (5)	289.50	5.75	2.50	52.90	0.00	350.65	0.00	0.00	0.00	0.00	0.00	0.00	350.65
BCKV, Nadia, West Bengal (3)	209.10	2.50	0.70	34.05	0.00	246.35	0.00	0.00	0.00	0.00	0.00	0.00	246.35
WBUA&FS, Kolkata (3)	146.00	2.75	1.50	32.50	0.00	182.75	0.00	0.00	0.00	0.00	0.00	0.00	182.75
ICAR													
CARI, A&N Islands (3)	154.00	4.55	0.50	15.40	8.00	182.45	0.00	0.00	0.00	0.00	0.00	0.00	182.45
ICAR RCER, Patna, Bihar (1)	74.00	1.00	0.50	12.60	0.00	88.10	0.00	110.72	0.00	0.00	0.00	110.72	198.82
CRRI, Cuttack, Orissa (1)	55.30	0.80	0.50	8.00	0.00	64.60	0.00	0.00	0.00	0.00	0.00	0.00	64.60
IINRG, Ranchi (1)	0.00	0.00	0.00	0.50	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	3.50
CRIJAF, West Bengal (1)	77.00	1.25	0.15	13.00	0.00	91.40	0.00	0.00	0.00	0.00	0.00	0.00	91.40
Central Univerisity, West Bengal (1)	73.70	0.90	0.20	10.30	0.00	85.10	0.00	0.00	0.00	0.00	0.00	0.00	85.10
State Govt. Undertaking													
SCADA, Bihar (1)	79.00	1.25	0.50	10.70	0.00	91.45	0.00	0.00	0.00	0.00	0.00	0.00	91.45
WBCADC, Kolkata (1)	68.00	1.00	0.50	11.00	0.00	80.50	0.00	0.00	0.00	0.00	0.00	0.00	80.50
NGO													
Bihar (5)	322.56	4.35	2.00	53.70	0.00	382.61	7.00	0.00	0.00	16.00	0.00	23.00	405.61
Jharkhand (5)	398.00	4.35	1.90	43.50	15.00	462.75	5.00	0.00	0.00	8.00	8.00	21.00	483.75
West Bengal (4)	259.45	4.20	1.00	40.00	0.00	304.65	1.50	0.00	0.00	8.00	0.00	9.50	314.15
Strengthening of DEEs													
DEE, BAU, Sabour, Bihar	0.00	2.45	4.50	9.55	0.00	16.50	0.00	0.00	0.00	0.00	0.00	0.00	16.50
DEE, RAU, Pusa, Bihar	0.00	1.50	2.50	5.50	0.00	9.50	0.00	0.00	0.00	0.00	0.00	0.00	9.50
DEE, BAU, Ranchi, Jharkhand	0.00	2.70	6.50	12.50	0.00	21.70	0.00	0.00	0.00	0.00	0.00	0.00	21.70
DEE, UBKV, Coochbehar, WB	0.00	2.00	1.00	4.60	0.00	7.60	0.00	0.00	0.00	0.00	0.00	0.00	7.60
DEE, BCKV, Nadia, WB	0.00	1.70	2.50	6.50	0.00	10.70	0.00	0.00	0.00	0.00	0.00	0.00	10.70
DEE, WBUA&FS, Kolkata, WB	0.00	0.50	2.00	5.20	0.00	7.70	0.00	0.00	0.00	0.00	0.00	0.00	7.70
GRAND TOTAL	4489.83	91.35	47.30	878.70	55.00	5562.18	48.00	201.82	0.00	40.00	16.00	305.82	5871.00*

*Includes rupees 3.0 lakh provided to KVK Khunti, Jharkhand as Revolving fund.

2.0 ABOUT KRISHI VIGYAN KENDRA

KVK is a front-line agricultural extension project being operated by the Indian Council of Agricultural Research (ICAR). It primarily aims at strengthening the extension systems of the district, caters to the training needs of the farmers and extension functionaries, and facilitates the spread of technologies tailored to the diverse environment of farmers. The KVKs also provide the farmers the access to improved agricultural and allied technologies and various development schemes of centre/state government through information support. Providing technical expertise to other organizations in implementing agricultural and rural development programmes is also a core area of KVK functioning.

The genesis of Krishi Vigyan Kendra : Based on the recommendation of the Education Commission (1964-66), consideration / review by the Planning Commission and Inter-Ministerial Committee, and further recommendation by the committee headed by Dr.Mohan Singh Mehta appointed by ICAR in 1973 the idea of establishment of Farm Science Centre (Krishi Vigyan Kendra) was evolved.

The first KVK, on a pilot basis, was established in 1974 at Pondicherry under the administrative control of Tamil Nadu Agricultural University, Coimbatore. The Planning Commission approved the proposal of the ICAR to establish 18 KVKs during the Fifth Five Year Plan. With the growing demand for more such Kendras, 12 more KVKs were approved by the Governing Body of the Council in 1979 and established in the same year from Agricultural Produce Cess Fund (AP Cess). Pending clearance of the Sixth Five-Year Plan scheme on KVK by the Planning Commission, 14 additional KVKs were again approved by the Council in 1981, which were established during 1982-83 from AP Cess Fund.

A High Level Evaluation Committee on KVK was constituted by the ICAR in 1984, who after thorough review of the programme, strongly recommended for the establishment of more KVKs in the country. Keeping this in view, the Planning Commission approved to establish 44 KVKs during the Sixth Plan. Thus, by the end of Sixth Plan, 89, KVKs had started functioning in the country.

During Seventh Plan, 20 new KVKs were established. The success of KVKs at many locations created a great demand for establishment of more KVKs in the remaining districts of the country. Accordingly, the Planning Commission further approved 74 new KVKs to be established during the period 1992-93. Again in the Eighth Plan (1992-97), 78 new KVKs were approved and the same were established in the country, making total number of functional KVKs by the end of the Eighth Plan to 261.

The number of KVKs increased to 290 during Ninth Plan with the establishment of 29 KVKs.

On the occasion of the independence Day Speech on 15th August, 2005 the Hon'ble Prime Minister of India announced that by the end of 2007 there should be one KVK in each of the rural districts of the country. Accordingly, the number of KVKs increased substantially during subsequent five year plans. However, one KVK in one district was felt inadequate to reach out the farmers of every corner of the district which necessitated considering establishment of additional KVKs in the larger districts of the country. Implementation of the proposal by Indian Council of Agricultural Research has led to establishment of 638 KVKs across the country till the end of eleventh five year plan.

Zonal Project Directorate, Zone-II within its jurisdiction is having 82 KVKs spread across the Union Territory of Andaman & Nicobar Islands and the states of Bihar, Jharkhand and West Bengal. The zone is credited with the establishment of second KVK of the country at Midnapore district of West Bengal in the year 1977 under the administrative control of Seva Bharati, an NGO. Out of three identified larger districts of this zone to have additional KVKs, one such KVK has already been established and the process is on to get other two additional KVKs. The distribution of KVKs in the zone is presented in Table.

Table: State wise status of Krishi Vigyan Kendras

Name of the State	No. of sanctioned KVKs	No.of KVKs under							Total
		SAU	ICAR	DU	CU	NGO	SDA	Oths	
Bihar	38	31	1			5	1		38
Jharkhand	24	16	2			5	-		23
West Bengal	21 (18 + 3 for larger districts)	11	1	1	1	3	1		18
A&N Islands	3		3						3
Total	86	58	7	1	1	13	2		82

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

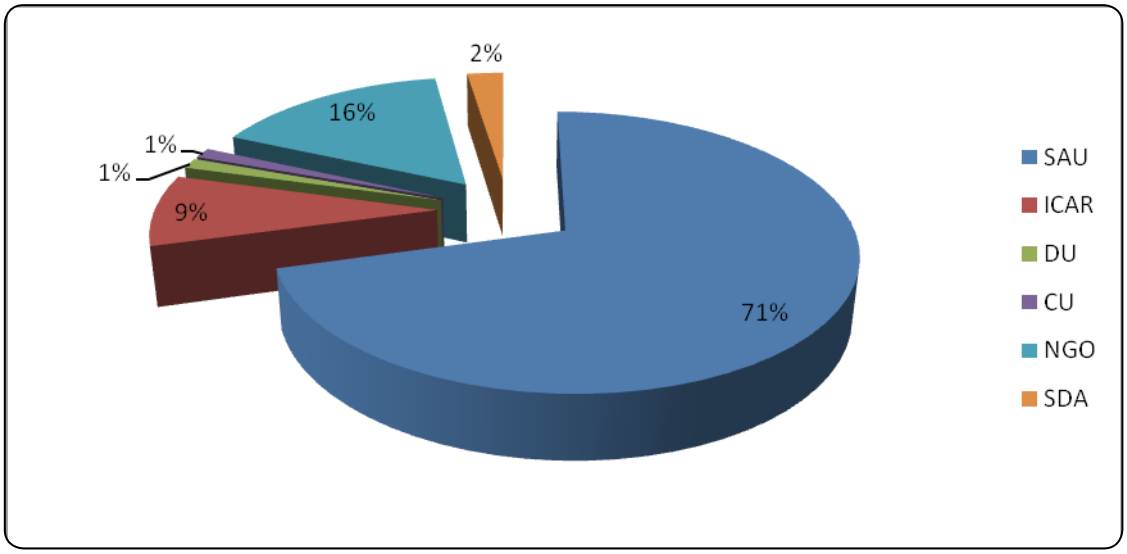


Fig: Distribution of KVKs in Zone-II

Sl. No.	State/UT	Host Institution	Total
1.	A & N Islands(3)	Central Agricultural Research Institute, (ICAR) Port Blair	3
2.	Bihar (38)	Rajendra Agricultural University, Pusa, Samastipur	11
		Bihar Agricultural University , Bhagalpur	20
		ICAR Research Complex for Eastern Region, Patna	1
		Sone Command Area Development Agency, (SDA) Bhojpur	1
		Shrama Bharti, Khadigram, Jamui (NGO)	1
		Vanavasi Seva Kendra, Bhabhua, Kaimur (NGO)	1
		S.K. Chaudhary Educational Trust, Madhubani (NGO)	1
		Gram Nirman Mandal, Nawada (NGO)	1
		Samata Seva Kendra, Sitamarhi (NGO)	1

Sl. No.	State/UT	Host Institution	Total
3.	Jharkhand (24)	Birsa Agricultural University, Kanke, Ranchi	16
		Central Rice Research Institute, (ICAR) Cuttack	1
		Ram Krishna Mission Ashram, Ranchi (NGO)	1
		Holy Cross, Hazaribag (NGO)	1
		Vikas Bharati, Gumla (NGO)	1
		Santhal Paharia, Deoghar (NGO)*	1
		Garmin Vikas Trust, Godda (NGO)	1
		Indian Institute of Resins and Gum, Namkum, Ranchi	1
4.	West Bengal (18)	Bidhan Chandra Krishi Viswavidyalaya, Nadia	3
		Uttar Banga Krishi Viswavidyalaya, Coochbehar	5
		West Bengal University of Animal & Fishery Sciences, Kolkata	3
		Visva Bharati, Bolpur, Santiniketan (CU)	1
		Central Research Institute for Jute and Allied Fibres, (ICAR) Barrackpore	1
		W.B. Comprehensive Area Development Corporation, (SDA) Kolkata	1
		Kalyan, Purulia (NGO)	1
		Seva Bharati, West Midnapore (NGO)	1
		Rama Krishna Ashram, South 24-Parganas (NGO)	1
		Ram Krishna Mission Vivekananda Universty, Belur Math	1
	Total		82

* presantly under the contract of District Administration.

Mandate: The mandate of Krishi Vigyan Kendras is to assess, refine and demonstrate technologies/products to cater to the needs of farming community, extension personnel and other stakeholders in the district. In order to accomplish the aim, KVKs carry out the following activities:

- To conduct on-farm trials to identify the location specificity of agricultural technologies under various farming systems.
- To organize frontline demonstrations to establish production potential of various crops and enterprises on the farmers' fields.
- To organize need based training for farmers to update their knowledge and skill on modern agricultural technologies and provide training to extension personnel to orient them in the frontier areas of technology development.
- To create awareness about improved agricultural technologies among various clientele groups through appropriate extension programmes.
- To produce quality seeds, planting materials, livestock breeds, animal products, bio-products etc. as per the demand and supply the same to different clienteles.
- To work as knowledge and resource centre of agricultural technologies to support the initiatives of public, private and voluntary sectors for improving the agricultural economy of the district.

Manpower: Based on the assigned mandate, objectives and responsibilities, KVKs have been provided with the sanctioned strength of 16 staff which includes one Programme Coordinator, six Subject Matter Specialists, three Programme Assistants, two administrative staff, two drivers and two supporting staff. Accordingly, the total sanctioned staff for 82 KVKs of Zone II is 1312, out of which 952 (72.56 per cent) are in position. Details of state wise and category wise staff strength of KVKs are furnished in the following table:

Table: Staff position in KVK

Category	BIHAR			JHARKHAND			WEST BENGAL			A & N ISLANDS			TOTAL		
	S	F	V	S	F	V	S	F	V	S	F	V	S	F	V
Programme Coordinator	38	18	20	23	9	14	18	11	7	3	1	2	82	39	43
Subject Matter Specialist	228	186	42	138	89	49	108	72	36	18	10	8	492	357	135
Programme Assistant (Lab Technician)	38	25	13	23	19	4	18	9	9	3	2	1	82	55	27
Programme Assistant (Computer)	38	31	7	23	11	12	18	10	8	3	1	2	82	53	29
Farm Manager	38	25	13	23	13	10	18	13	5	3	1	2	82	52	30
Assistant	38	32	6	23	11	12	18	13	5	3	2	1	82	58	24
Stenographer grade III	38	30	8	23	13	10	18	14	4	3	1	2	82	58	24
Driver	76	65	11	46	38	8	36	33	3	6	2	4	164	138	26
Supporting staff Grade I	76	67	9	46	43	3	36	31	5	6	1	5	164	142	22
Total	608	479	129	368	246	122	288	206	82	48	21	27	1312	952	360

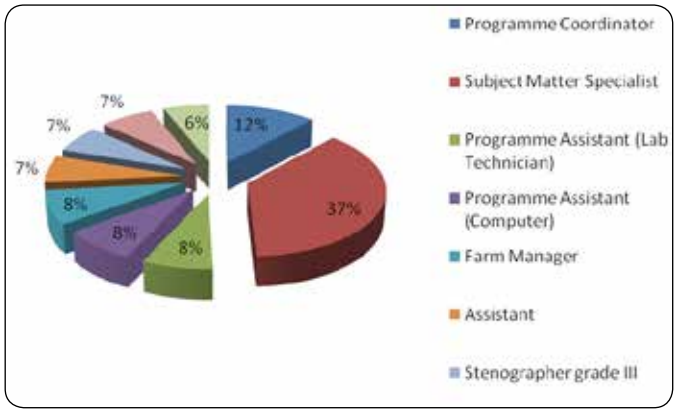


Fig: Vacant Position in different category of staff

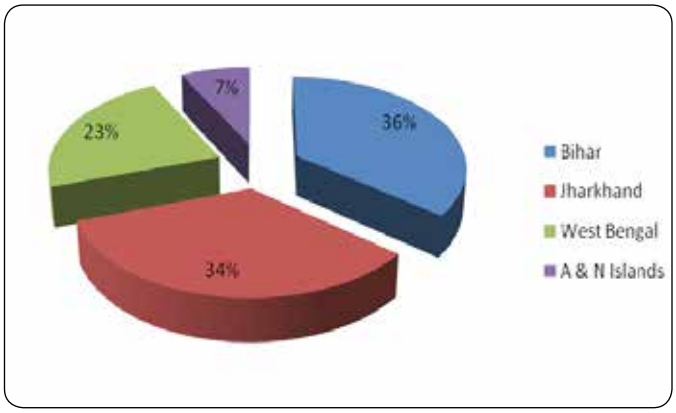


Fig: State -wise vacancy of staff

Scientific Advisory Committee: The Scientific Advisory Committee constituted by the KVK holds its meeting under the Chairmanship of the Head of Host Organization. Zonal Project Director, Heads of district line departments, progressive farmers, farm women, NGO representatives, District Lead Bank Official, ATMA, NABARD and other officials, AIR and Doordarshan and other invited members constitute the committee. During last one year, 76 out of 81 KVKs conducted SAC meeting which was attended by 2425 persons to review the performance of KVKs, evaluate plan of action for the ensuing cropping season and provide guidance to address varied agricultural issues.

Table: State wise SAC meeting conducted by KVKs

Name of State	No. of SAC conducted	No. of participants
A&N Islands	3	99
Bihar	36	1252
Jharkhand	22	704
West Bengal	15	370
Total-	76	2425

Revolving Fund: The KVKs of Zone-II have been provided revolving fund as one time seed money for its productive utilization through seed/ sapling production, small scale processing and value addition and other purposes to multiply the fund after refund of the principal amount. Presently, 78 KVKs of Zone-II are operating revolving fund and net balance was Rs. 5.94 crore as on 1st April, 2014 (Table).

Table no. Status of operating revolving scheme by the KVKs

State	Opening balance as on 1st April,2013	Income during the year 2013-14	Expenditure during the year 2013-14	Net balance in hand as on 1st April 2013-14
Bihar	27,104,183.84	29,703,922.08	23,116,238.85	34,762,317.65
Jharkhand	3,779,494.00	2,980,453.00	2,256,588.00	3,767,897.00
West Bengal	16,671,989.47	9,352,414.00	13,294,321.00	20,841,701.47
Total	47,555,667.31	42,036,789.08	38,667,147.85	59,371,916.12

Infrastructure facilities: In order to enable the KVKs to accomplish their set objectives, KVKs have been provided with number of infrastructure facilities like administrative building, farmers' hostel, staff quarter, demonstration unit, soil and water testing laboratories, rain water harvesting structure with micro-irrigation facilities, portable carp hatchery, IFS model, E-connectivity, vehicles etc. In most of the cases, KVKs utilize the facilities for the cause of the farmers to demonstrate the benefit of proper management practices/ suitable technologies. The details of infrastructure facilities available with the KVKs are given in Table.

Table: State-wise details of infrastructure available with KVKs

Sl. No.	Infrastracture	A&N Islands	Bihar	Jharkhand	West Bengal	Total
1	Administrative Building	1	37	21	17	76
2	Farmers' Hostel	1	37	22	17	77
3	Staff Quarter	1	37	21	15	74
4	Demonstration Unit	2	51	35	32	120
5	Rain water harvesting		1	19	6	26
6	E-connectivity	1	5	4	5	15
7	Soil & water testing	1	24	16	13	54
8	Portable carp harchery	1	1	2	8	12
9	Minimal procesing unit			1	3	4
10	Plant Health diagnostic facilty		8	10	8	26
11	Integrated farming system		7	6	9	22
12	Jeep	3	38	22	18	81
13	Tractor	1	38	22	18	79
14	Two wheeler	2	0	1	0	3

Thrust area: Thrust areas are identified based on the prevailing agro-ecological situation, existing cropping pattern and farming systems and expectation of the district economy on agriculture. Accordingly, KVKs are working on the following thrust areas:

- » Diversification of cropping system and development of alternate land use system
- » Change of agriculture from cropping to farming system mode
- » Sustainable rainfed farming
- » Water harvesting and watershed management
- » Integrated nutrient, pest and disease management
- » Introduction and upscale of improved varieties/ hybrids of crops and breeds of livestock through quality input and technology back up
- » Empowerment of women in terms of improved nutrition, income and drudgery reduction through technological literacy
- » Scientific management of livestock
- » Promotion of horticulture for augmenting family income
- » Value addition, processing and market facilitation of household and commercial enterprises
- » Small scale mechanization for reducing cost and drudgery
- » Capacity building among rural youths towards self-employment

3.0 ABOUT ZONAL PROJECT DIRECTORATE

The network of Krishi Vigyan Kendra spread across the country is the domain of Indian Council of Agricultural Research, New Delhi. The Division of agricultural Extension of ICAR under the leadership of Deputy director General looks after the administrative, financial and overall functioning of KVK. The Division of Agricultural Extension of ICAR is supported by eight Zonal Project Directorates in monitoring the KVK system. The zonal Project Directorates located at Ludhiana, Kolkata, Barapani, Kanpur, Hyderabad, Jodhpur, Jabalpur and Bangalore have their own jurisdiction with assigned responsibility to plan, implement, guide and evaluate the programme and performance o KVKs.

Genesis: The Zonal Project Directorate (erstwhile Zonal Coordinating Unit), Zone-II began its journey from the office premises located within the Directorate of Extension Education Complex of B.C.K.V., Mohanpur, Nadia, West Bengal with the specific objective to monitor and evaluate the Lab to Land Programme (LLP), country wide launched in the year 1979 in celebration of the ICAR Golden Jubilee Year and drawing fund support from the Cess Fund of ICAR. Alongside, it was entrusted with the responsibility to monitor and guide the activities of KVKs which were gradually coming up that time with great future promise as District Level First Line Agricultural Institutions. The initial operational jurisdiction of the Unit was spread over West Bengal, Orissa and A&N Islands. However, due to demanding administrative reasons, the state of Bihar was subsequently brought under the fold of Zone-II in the year 1991 in lieu of Orissa, which was then shifted under Zone VII. The jurisdiction of ZPD was further extended to include the newly created state of Jharkhand in the year 2000. After ten years of its operation from B.C.K.V., the office of the then ZPD-II was shifted to Veterinary College Campus, Belgachia, Kolkata for required infrastructural facilities. However, conversion of Veterinary College into West Bengal University of Animal and Fishery Sciences again necessitated the Unit to shift its office to NBSS&LUP Campus, Salt Lake, Kolkata in the year 1996. During those years of instability in office housing, nevertheless, the Unit went on widening its service domains creditably in the form of successful implementation of a score of ICAR supported programmes like Operational Research Project, National Demonstration and All India Coordinated Research Project on Scheduled Caste and Scheduled Tribe. Besides, special projects on Frontline Demonstrations under National Oilseed Production Programme (NOPP) and under National Pulse Production Programme (NPPP) were also carried out. Front Line Demonstrations on Farm Implements and Cotton were also initiated by this Unit in this Zone. Finally, the Zonal Coordinating Unit has been upgraded to Zonal Project Directorate in the pattern of other Project Directorates / Institutes of ICAR including administrative and financial power since 2009.

Mandate: The Zonal Project Directorate functions to achieve the following mandates:

- » Formulate, implement, monitor, guide and evaluate the progrmmes and activities of KVKs.
- » Coordinate the work relating to KVKs and ATICs implemented through various agendies such as SAUs, ICAR institutes, voluntary agencies and development departments.
- » Coordinate with State/Central Government organizations, financial institutions and other

organizations for successful implementation of programmes.

» Partnering with Directorates of Extension Education of SAUs in assured technological backstopping to KVKs and appropriate overseeing of KVK activities.

» Strengthening the Directorates of Extension Education of SAUs with financial support.

» Serve as feedback mechanism from the projects to research and extension systems.

» Implementing projects of lCAR like NICRA, NIFTD and others.

» Maintain close liaison with ICAR headquarter particularly with Division of Agricultural Extension for preparing reports, write ups and other important documents.

Staff: The Zonal Project Directorate, Zone-II, Kolkata is having total sanctioned staff strength of 19, out of which 14 are filled up

Table.: Staff strength of Zonal Project Directorate, Zone-II

Category	Sanctioned	Filled
Zonal Project Director (RMP)	1	1
Scientific	6	5
Technical	2	1
Administrative	8	6
Skilled Supporting Staff (Gr. II)	2	1
Total	19	14

3.1 Institute Management Committee

The Zonal Project Directorate, Zone-II convened three Institute Management Committee meeting on 4 May 2013, 5 October 2013 and 6 March 2014. In all the occasion, Dr. A.K. Singh welcomed the nominated members and explained the relevance of conducting the meeting. The members were apprised of the functioning of Zonal Project Directorate, achievements and various initiatives taken to address agriculture and allied areas in a holistic and time bound manner. In the course of discussion KVKs and their contribution towards providing technological, information and other support to various clientele groups were also highlighted. Besides according approval for the proposed agenda items, the members enriched the Directorate with their fruitful guidance for the effective functioning of the Directorate.

3.2 Completion and taking over new administrative building

New administrative building of the Directorate was completed and inaugurated by Dr. Mangala Rai, Agriculture Advisor to the Chief Minister of Bihar and former Secretary (DARE) & Director General (ICAR) on 14th April 2013 in the presence of Dr. S. Ayyappan, Secretary (DARE) & Director General (ICAR), Deputy Directors General, ICAR, Vice-Chancellors of SAU, Directors of ICAR institutes as well as Heads of Regional Stations, innovative farmers, KVK personnel and other invited guests. A small but attractive display farm innovations was also organized to enable the innovators to interact and explain their innovations to the dignitaries. The completion of administrative building led to shifting of office set up to the new premises with the amenities and facilities erected for the staff of Directorate.

3.3 Initiative of Zonal Project Directorate to enhance the visibility of KVKs

Apart from regular activities, Zonal Project Directorate also involved the KVKs in a number of flagship programmes based on the need of the district as well as availability of expertise and ability of KVKs to contribute towards growth of agriculture and allied sector. The major programmes being carried out through the KVKs include National Initiative on Climate Resilient Agriculture (NICRA), National Initiative on Fodder Technology Demonstration (NIFTD), Monitoring and Surveillance of Animal Diseases (MSAD), Strategic Deworming of Livestock (SDL), Nutritional Trial in Wheat and Maize (NTWM), Assessment of Suitable Cultivar of Wheat (ASCW), Preservation of Plant Varieties and Farmers' Rights (PPV&FR) etc. A brief about such initiatives is presented below.

Livelihood development of Islands dwellers: The past one year has witnessed a unique development effort towards improving livelihood, human resource and overall living standard of the dwellers of Bali Islands, Sunderban, South

24 Parganas, a nodal institution, Zonal Project Directorate assessed the resources, interacted with a large number of farmers, farm-women and youths, prepared a holistic plan of development and executed all the needed interventions through KVK, South 24 Parganas (Nimpith). Based on the PRA survey conducted in Bali Islands, action plan in the convergence mode with CIARI, Port Blair, KVK Nimpith and Zonal Project Directorate was prepared and various interventions were executed with the fund support of CIARI. The initiative taken by the Zonal Project Directorate also influenced ICAR Research Complex for North Eastern Region, Barapani to extend supporting hand for further development of Bali Islands. The action plan will accordingly be modified in consultation with ICAR RC NEH for its implementation through KVK Nimpith under the supervision of Zonal Project Directorate.

National Initiative on Climate Resiliant Agriculture (NICRA): In this project 15 KVKs are involved in executing identified interventions for crop production, livestock rearing and fish production. The KVKs are mainly working to empower the farming community to cope-up with the climatic vulnerability in respect of crop production and livestock rearing. The KVKs have constituted Village Climate Risk Management Committee (VCRMC) and established Custom Hiring Centres for improved farm implements and machinery. The VCRMC, Nawada has generated a revenue of Rs. 3.29 lakhs, the highest amount in the zone. The Zonal Monitoring Committee headed by Dr H S Sen, former Director, CRIJAF undertook field visit to several implementation sites and offered valuable suggestions. Natural resource management, renovation of old as well as defunct water bodies, creation of alternate source of irrigation, community check dam, staggered nursery, implementation of alternate cropping system with resistant/ tolerant crop varieties etc. are some of the significant achievements recorded by the KVKs so far.

National Initiative on Fodder Technology Demonstration (NIFTD): Programme to augment fodder productivity, 11 KVKs are involved. The Zonal Project Directorate as the Nodal Institution is coordinating the implementation of the programme through 91 KVKs and 8 Zonal Project Directorates across the country. The selected KVKs have been trained at IGFRI, MPKV and FTC, Kalyani on taking up fodder crop demonstration and fodder seed production programme. Technology module for all the identified KVKs has been finalized in consultation with IGFRI and participating KVKs. The requirement of seed/ slip to implement the programme has also been worked out. The Zonal Project Directorate has shouldered the entire responsibility to carry out the programme with the support of IGFRI and ICAR.

Monitoring and Surveillance of Animal Diseases: In collaboration with National Institute of Veterinary Epidemiology and Disease Informatics (Formerly PD_ ADMAS), Bangalore and IVRI Eastern Regional Station, Belgachia, Kolkata, 13 KVKs of West Bengal have been entrusted to work on surveillance of animal diseases to report to PD_ADMAS, ICAR and Zonal Project Directorate. The KVKs will be the first organizations to report the incidence of any animal/poultry disease in the district to effectively execute preventive measures.

Strategic Deworming of Livestock (SDL): As a part of a research project of IVRI Regional Station, Belgachia, Kolkata, three KVKs of West Bengal namely, Burdwan, Hooghly and South 24 Parganas are carrying out strategic deworming of livestock to assess the growth and other parameters. The experts of the KVKs are regularly collecting the faecal sample of the livestock to understand the correlation between weather parameters and worm infestation to develop a comprehensive strategy to overcome the problem and enhance productivity of livestock.

Friends of Coconut Tree (FOCT): The Coconut Development Board has launched a scheme called Friends of Coconut Tree (FOCT) which is aimed at capacity building of coconut farmers who usually face difficulty in harvesting and carrying out plant protection measures. The Board supports 6 days residential training of unemployed youth of 18-40 years including 30% women. On successful completion of training participants are given palm climbing device free of cost. Beneficiaries are selected by the KVKs in consultation with the district line departments.

During the year 2013-14, six KVKs (Nadia, Howrah, Hooghly, North 24 Parganas, South 24 Parganas, South Dinajpur) of

Zone II have successfully conducted FOCT training and a total of 237 farmers/farm women were benefitted.

Nutritional Trial in Wheat and Maize: International Plant Nutrient Institute has been tied up with 24 KVKs of this zone to carry out specific trial on plant nutrition in wheat and maize. The validation of nutrient management model will be done through the trials. The programme has just been initiated and the results of the trials are awaited.

Assessment of Suitable Cultivar of Wheat: Directorate of Wheat Research is in the process of identifying suitable cultivar for northern part of West Bengal through 3 KVKs namely, Murshidabad, Coochbehar and Jalpaiguri. The KVKs are in the process of finalizing the results of the varietal trials.

Plant Protection Varieties and Farmers' Rights (PP&VR): In view of establishing an effective system for protection of plant varieties, the rights of farmers and plant breeders as well as to encourage the development of new varieties of plants, the Zonal Project Directorate in collaboration with Protection of Plant Varieties and Farmers' Rights Authority, Ministry of Agriculture, Govt. of India organized a sensitization workshop to create awareness among the farmers about various benefits of PPV&FR Act. In spreading the provision of this act as well as encourage the farmers to go for registration of their traditional varieties, 24 KVKs have been involved in this programme. All the KVKs conducted awareness programme in the respective KVK district with the participation of large number of farmers followed by registration of more than 700 plant varieties.

Farm Innovators Meet: Identification and proper documentation of farm innovations were another important area which was adequately dealt with during both the years. At the level of Zonal Project Directorate, special farm innovators meet was organized to highlight various innovations of the farmers having distinctive quality to overcome difficulties in agricultural and other activities or potential to develop human resources through entrepreneurship. A few innovations of KVK were applauded at the National Level also followed by participation of three more farm innovators in the Farm Innovators Meet at IIHR, Bangalore and NASC, New Delhi.

Terms of Agreement with PDFSR: Efforts were also directed towards strengthening inter-institutional linkage between PDFSR, Modipuram and ZPD-II, Kolkata to develop and upscaling IFS model in collaboration with PDFSR. Initially, three KVKs – Dumka in Jharkhand, Purnea in Bihar and South 24 Parganas in West Bengal were identified to carry out initial activities alongwith the ECF stations functioning in the identified districts. The collaboration is mainly aimed at delivery of technologies in farming system mode especially for small and marginal farmers.

Cereal Systems Initiative for South Asia (CSISA): CSISA aims to catalyze the widespread dissemination of production and post-harvest technologies to increase cereal productivity, resource use efficiency and income. The endeavour of IRRI has been supported by this Zonal Project Directorate through allowing 5 KVKs of Bihar in taking up advanced crop production and post-harvest technologies among the farmers.

International Centre for Agricultural Research in Dryland Areas (ICARDA): This systems approach includes research on integrated crop-livestock-rangeland systems, more efficient use of soil and water resources, and the introduction of new crops and crop varieties into traditional farming systems to improve yield and yield stability, nutrition, income and livelihood. Based on the need of the district, 3 KVKs of Bihar have been initially permitted to work in close collaboration with the organization. It is anticipated that ecosystem-based farming may has the potential to reduce crop water needs by 30 percent and energy costs of production by up to 60 percent.

4.0 ACHIVEMENTS

4.1 On-farm trial

Potentiality of newly developed technologies under varied farming situation is assessed by the KVKs through conducting on-farm trials. Assessment of technologies sometimes leads to the necessity of refining the technology either at KVK level or through the research organization from where it was generated. In most of the cases, however, the KVKs put a priority to assessment of technology. Technologies related to crop production, insect-pest and disease management, nutrient management, feed and fodder management, livestock production and health management, drudgery reduction, value addition and other identified areas have been assessed by 80 KVKs of Zone-II to provide technological solution to the farming community pertaining to various aspects of agriculture and allied areas. During the year 2013-14, the KVKs conducted 649 number of on-farm trials in 6250 different farming situations to assess 205 technologies. Among various thematic areas, technology assessment was conducted in integrated crop management

through 124 on-farm trials followed by integrated nutrient management (84), integrated pest management (75), varietal evaluation (60), resource conservation technology (45) and others. In livestock sector, the highest number (25) of on-farm trial was conducted in each of the areas like Nutrient management and Production and management followed by Disease management (13). State-wise analysis of on-farm trials conducted showed that 63 on-farm trials were conducted by KVKs of Bihar in integrated crop management, 35 by KVKs of Jharkhand and 23 by KVKs of West Bengal in the same thematic area. The other important areas for the KVKs of Bihar were integrated pest management (41), integrated nutrient management (36), integrated disease management (28), varietal evaluation (28), weed management (28) etc. In Jharkhand, integrated crop management was the most important thematic area with 35 number of on-farm trials followed by integrated nutrient management (29), varietal evaluation (21), resource conservation technology (13) and others. In West Bengal, integrated crop management was the most important thematic area (23) followed by integrated nutrient management (19), integrated pest management (14) and varietal evaluation (10) etc. The performance of the technologies has also been brought to the notice of research and extension wing for their effective dissemination in the entire zone. Some of the on-farm trials conducted by the KVKs are presented below with table, photographs and related information.

Table: Thematic area wise on-farm trials conducted by KVKs of Zone II

Thematic Area	A & N Islands		Bihar		Jharkhand		West Bengal		Total	
	No. of locations	No. of OFT	No. of locations	No. of OFT	No. of locations	No. of OFT	No. of locations	No. of OFT	No. of locations	No. of OFT
Integrated Crop Management (ICM)	18	3	621	63	361	35	226	23	1226	124
Integrated Disease Management (IDM)	0	0	262	28	69	7	86	9	417	44
Integrated Nutrient Management (INM)	0	0	331	36	256	29	154	19	741	84
Integrated Pest Management (IPM)	7	1	390	41	179	18	122	14	698	74
Varietal Evaluation (VE)	1	1	252	28	195	21	78	10	526	60
Weed Management (WM)	0	0	306	28	25	2	34	5	365	35
Storage Technology (ST)	0	0	82	6	31	5	20	2	133	13
Value Addition (VA)	0	0	87	8	52	6	27	3	166	17
Resource Conservation Technology (RCT)	24	3	264	24	135	13	44	5	467	45
Integrated Farming System (IFS)	13	2	18	2	0	0	38	5	69	9
Drudgery Reduction (DR)	0	0	65	5	0	0	0	0	65	5
Farm Impliments & machineries (FIM)	0	0	30	4	18	2	21	3	69	9
Food and nutrition (F&N)	9	1	30	3	54	5	53	4	146	13
Others	6	1	91	10	8	1	27	3	132	15
Total	**78**	**12**	**2829**	**286**	**1383**	**144**	**930**	**105**	**5220**	**547**
Production and Management (P&M)	0	0	104	10	57	6	73	8	234	24
Nutrient Management (NM)	0	0	133	13	33	3	51	6	217	22
Fishery	4	1	44	6	10	1	65	8	123	16
Feed and fodder	0	0	20	2	40	3	39	2	99	7
Breed Evaluation (BE)	0	0	5	1	33	4	35	2	73	7
Disease Management (DM)	4	1	96	5	68	6	8	1	176	13
Total	**8**	**2**	**402**	**37**	**241**	**23**	**271**	**27**	**922**	**89**
Enterprise	15	3	36	4	40	4	17	2	108	13
Grand Total	**101**	**17**	**3267**	**327**	**1664**	**171**	**1218**	**134**	**6250**	**649**

A & N Islands

KVK Port Blair

Title: Performance of paddy under brown manuring (rice-dhaincha co-culture) in A & N conditions

Concurrent growing of dhaincha (*Sesbania aculeata*) and rice to improve its adaptability in farmer's fields as well as to make rice cultivation more profitable through reduced production cost and enhanced productivity, a field experiment was conducted at 8 locations in South Andamans. The soil was clay loam with medium organic carbon (0.35%), low in available nitrogen (195.3 kg ha^{-1}), low in available phosphorus (6.5 kg ha^{-1}) and medium in available potassium (225.8. kg ha^{-1}). Pre-germinated paddy seeds (30 kg) and dhaincha seeds (20 kg) were sown simultaneously by using paddy-cum-dhaincha seeder (TNAU, Coimbatore, India). Sowing of paddy (cv. CARI Dhan-5) was done with no standing water and the field was lightly flooded after 24 hrs. of sowing. Then dhaincha seeds were uniformly broadcasted in a thin film of water two days after transplanting. Then 2, 4-D @1.0 kg·ha^{-1} was sprayed after 30 days of sowing of dhaincha to knock down growth of dhaicha and its early decomposition. The recommended dose of fertilizer @ 90: 60: 40 kg NPK was applied as urea, rock phosphate and muriate of potash.

Sowing of paddy cum dhaincha seeder

Broadcasting dhaincha in standing paddy

View at 30 DAT in paddy cum dhaincha plot

Table: Effect of brown manuring on yield attributes, weed parameters and economics of paddy

Technology options	Yield (q/ ha)	Add Bio-mass (q/ ha)	Productive tillers/ m^2	Filled grains/ panicle (nos.)	Total weed density (Nos.) @ DAT		Total weed dry weight (g) @ DAT		Weed control efficiency (%)@ DAT		Available N status after experiment (kg/ha)	Net return (Rs/ ha)	BC ratio
					20	40	20	40	20	40			
FP (Rice alone)	36.2	-	228	151.8	167	253	109.6	128.9	0	0	215.2	16800	1.9
TO-I: Paddy-cum- Dhaincha seed with 2, 4-D @ 0.5 kg a.i. ha^{-1}	48.9	78.0	332	205.1	52	24.5	44.3	14.3	68.9	90.3	278.8	28190	2.4
TO-II: Paddy with broadcasting dhaincha seed at 2 DAT and 2, 4-D @ 0.5 kg a.i. ha^{-1}	43.5	65.4	299	192.4	83.6	32.6	53.6	26.5	51.1	79.4	241.5	21820	2.0
CD (at 5% level)	4.2	-	43.0	20.3	32.9	38.4	14.1	73.5	-	-	-	-	-

FP: Farmers' practice; TO: Technology option; DAT: days after transplantation; CD: critical difference

View at 30 DAT in control plot

Spraying of 2,4-D @0.5 a.i. ha-1

View after dhaincha incorporation

Results revealed the beneficial effect of concurrent growing of dhaincha with rice that significantly increased the yield of rice (35.1%) compared to rice alone (Farmer's practice; FP). Growing dhaincha alongwith rice and its subsequent incorporation thus can reduce the use of nitrogenous fertilizers approximately by 25%, without affecting grain yield which is due to biomass addition and subsequent increase in the availability of nutrients in the soil. Significant variations were also observed on total weed density and dry weight at 20 and 40 DAP. The lowest weed count and dry weight were recorded in plots where dhaincha was incorporated by using 2, 4-D spray. Co-culture of rice and dhaincha had higher weed control efficiency of 79.6% at 20 DAT in TO-I and of 90.0% and 90.3% over FP at 40 DAT in TO-I and TO-II, respectively. Higher net return (Rs. 28190 ha^{-1}) with BC ratio of 2.36 was recorded in brown manuring plots; which was mainly due to higher grain and straw yield. Soil nutrient status in terms of available N indicated that plots having co-culture of rice with dhaincha had significantly higher available soil N (278.8 kg ha^{-1}).

West Bengal

KVK Bankura

Title: Performance of different shade materials on survivability of strawberry plant in red and lateritic belt of Bankura district of West Bengal

Under irrigated up and medium land situation, high mortality of strawberry plants in hot summer followed by heavy rain is a common problem in red and lateritic belt of Bankura district. In order to fortify the nursery management strategies, KVK Bankura conducted on firm trial in 16 locations of 4 villages on effect of different shade materials on nursery management towards survivability of strawberry plants against hot summer and rain. Results of the trial as reflected in Table (below) showed that Technology option-I (Plant were established in earthen pots and kept under Poly house in hot summer as well as rainy season) recorded better performance by obtaining net return Rs. 4000/100 nos. of plants and also recorded highest BC ratio (2.14).

Table: Effect of shade materials used against mortality of strawberry plants during summer and rainy season

Technology option	% of plant survivability	Total No. of suckers produced/100 plants	Cost of plants (Rs)/100 plants	Net return (Rs)/100 plants	BC ratio
FP: Plants were kept in open condition throughout the year	25	25	2000	(-)1500	-
TO-I: Plants were established in earthen pots and kept under Poly house in hot summer as well as rainy season.	75	375	3500	(+)4,000	2.1
TO-II: Plants were established in earthen pots and kept under Shade house (50%) in hot summer as well as rainy season.	50	200	4000	0	1.0
TO-III: Plants were established in earthen pots and kept under thatched house in hot summer as well as rainy season.	30	60	4000	(-)2,800	-
CD (at 5% level)	10.3	18.4	-	-	-

KVK Birbhum

Title: Profitability due to integration of different components under fish based production systems

In order to solve the problem of lower profitability under fish based production system, a trial was conducted by KVK Birbhum at 7 different locations of the district. The results of the trial indicated that Technology Option-I i.e. Composite fish culture +poultry +pulses exhibited higher BC ratio (2.32) than that of Technology Option-II (1.99) and farmers' practice (1.28). Here it is to be mentioned that gross return and net return was higher in integrated farming system where vegetable cultivation was one of the components. It might be due to higher value of vegetables than pulses. But due to low cost of cultivation BC ratio was higher in integrated farming system where pulses was the component. Poultry litter was also used as feed of fishes in both Technology Option-I and II. But in Technology Option-I, the leftover materials of pulses were used as feed of fishes and poultry. So integration was more among the components in the Technology Option-I. Further, man-days utilization (260 per year) was slightly higher in Technology Option-II than Technology Option-I (245 per year). In farmers' practice, man-days utilization was very low (14 per year) and BC ratio was also very low (1.28). Therefore, it might be concluded that integrated farming system with composite fish culture, poultry farming and pulse cultivation in bank of the pond was very effective to integrate the components in profitable manner.

Table: Profitability under fish based integrated farming system

Technology option	Man-days utilized per year	Cost of cultivation (Rs/unit*)	Net Return (Rs/unit*)	BC ratio
FP: Traditional fish farming	14	27450	1737	1.3
TO-I: Composite fish culture (IMC) + Poultry farming (Black Australorp 71 nos) + Pulses (Redgram- Blackgram)	245	45035	50521	2.3
TO-II: Composite fish culture (IMC) + Poultry farming (Black Australorp 71 nos) + Vegetables (ladys' finger-capsicum)	260	67516	66684	2.0

* 1 unit: 0.19 ha water body and 0.13 ha land area

KVK Burdwan

Title: Evaluation of performance of different varieties of jute under rainfed and medium upland situation of Burdwan district

In a jute based production system of Burdwan district, a common problem encountered was low productivity of the system due to improper use of variety (mainly local variety of jute). In order to overcome such a situation, a varietal trial was conducted at 5 different locations by the KVK Burdwan taking some commonly available jute varieties in consideration. The results indicated that CO 58 and JRO 204 produced significantly more fibre and were at par followed by JRO 128. JRO 524 produced significantly less fibre as compared to any other cultivar.

Table: Performance of various jute varieties under rainfed medium upland conditions

Technology option	Plant height (cm)	Yield (q/ha)	Cost of cultivation (Rs/ha)	Net return (Rs/ha)	BC ratio
FP: JRO 524	218	26.1	42500	16225	1.4
TO-I: JRO 128	226	30.5	42500	26125	1.6
TO-II: JRO 204	239	32.7	42500	31075	1.7
TO-III: CO 58	242	33.4	42500	32650	1.8
CD (at 5% level)	10.6	1.3	-	-	-

KVK Hooghly

Title: Evaluation of performance of different storage methods to increase the storability of onion seeds

Poor storability of onion seed prevented the farmers to obtain desired profit in Hooghly district. To increase the shelf life of the onion seeds, KVK Hooghly conducted a trial at 10 different locations which showed that Technology option-II (Seed storage in sealed container with silica gel as dessiccant + pre-sowing seed invigoration with 500 ppm KNO_3 for 20 minutes) resulted in higher germination percentage (94.20%) and higher BC ratio (3.33).

Table: Effect of different seed storage methods on storability of onion seeds

Technology option	Germination percentage	Speed of Germination	Seedling length (cm)	Seedling dry wt.(mg)	Seed vigour index*	Cost of cultivation (Rs/ha)	Net Return (Rs/ha)	BC ratio
FP: Seed storage in metal/ plastic container (without seal)	62.8	20.2	5.4	3.0	190.9	261874	557126	3.2
TO-I: Seed storage in sealed container with fused calcium chloride as dessiccant + pre-sowing seed invigoration with 500 ppm KNO_3 for 20 minutes	92	29.7	6.1	3.2	290.7	289924	655076	3.3
TO-II: Seed storage in sealed container with silica gel as dessiccant + pre-sowing seed invigoration with 500 ppm KNO_3 for 20 minutes	94.2	29.3	6.3	4.1	382.5	284186	660814	3.3
CD (at 5% level)	4.9	1.7	0.2	0.2	-	-	-	-

* Seed vigour index= Germination (%) x Seedling dry wt. (mg)

KVK Murshidabad

Title: Assessment of Raikhor bata (*Cirrhinus reba*) culture with Indian major carps in seasonal fish ponds in Murshidabad district

In seasonal fish ponds of Murshidabad district, commonly grown fishes include the IMCs and other carps which are less remunerative than the culture of the delicious fish, i.e., bata (*Labeo bata*). Again, during some parts of the year, Raikhor bata *(C. reba)*, a native freshwater fish of Padma and Bhagirathi river, gets entry to the ponds connected to river for hatching of eggs. The stock then grows in numbers in those ponds. Further due to the low market price of bata (*Labeo bata*) compared to Raikhor bata *(C. reba)*, culture of IMCs with bata is reducing gradually in the district of Murshidabad. It was imperative to work out suitable alternatives in order to increase such fish cultures in the district. Therefore, a trial was conducted at 7 different locations of the district to assess the performance of Raikhor bata (C. *reba*) cultured with Indian Major Carps in the seasonal ponds. During the trial, mortality of fishes occurred due to transportation from long distances, irregular lime application, no provision of fish feed and netting during winter etc. Some diseases of fish recorded during the trial were ulcer, fin rod, dropsy, gill diseases and stroke in winter season. The results showed that yield (5.40 q/ha.) of fish under Technology option-II had the best BC ratio of 2.4.

Table: Performance of Raikhor bata when cultured with IMCs

Technology option	Stocking density (nos./ha)	Survival rate (%)	Wt.at maturity (g)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Net return (Rs./ha)	BC ratio
FP: Composite fish culture system	11250	60	60	3.6	25500	27700	1.6
TO-I: IMC+ Bata (3:4:3)	11250	60	80	5.8	35625	39255	2.1
TO-II: IMC+ Bata + Raikhor bata (3:4:3)	11250	60	75	5.4	39375	57825	2.4

KVK Purulia

Title: Effect of different organic acids supplementation & antibiotics in poultry feed on production performance of Khaki Campbell ducks under extensive system of management under of Red and Lateritic Zone of Purulia District, West Bengal

The average production of duck in Purulia district (4,98,778 Nos.) is much less than the state average. Ducks are mainly reared due to low rearing cost and larger egg size. Growth of duck decreases due to gastrointestinal tract infection and frequent use of antibiotics leading to antibiotic resistance. In this context, organic acid has the capability to penetrate the cell wall and kill the pathogenic bacteria and also maintain the normal function of gastrointestinal tract. In order to explore the possibilities of the use of antibiotics along with organic acid salts, a trial was conducted by KVK Purulia at 11 different locations. The results showed that the Technology option-II [Homestead diet 200 gms daily along with Amonium formate(0.15%) + Calcium propionate (0.15%) for 2 months feeding in duck] increased egg laying capacity as well as body weight gain at five month and BC ratio.

Table: Effect of antibiotics and organic acid salts on egg production in Khaki Campbell ducks

Technology option	Yield component			Mortality (%)	Yield (No. of Eggs/ bird/ year)	Gross cost (Rs/unit) 1 unit = 10birds	Net return (Rs/unit) 1 unit = 10 birds	BC ratio
	Body weight gained at 5th month (Kg/Bird)	Intestinal Count of Coliform (x 10^2)(CFU/g feed sample)	Intestinal Count of Clostridium sp(CFU/g feed sample)					
FP: Homestead diet without any antibiotics and acidifies	1.6	14.4	3.7	9	240	5500	3265	1.6
TO-I: Homestead diet 200 gms daily along with antibiotics (Sulfamethoxazole @5gm/kg feed) for 2 months.	1.7	4.7	4.1	4	255	5600	3638	1.6
TO-II: Homestead diet 200 gms daily along with Amonium formate(0.15%) + Calcium propionate (0.15%) for 2 months.	1.8	4.3	6.4	2	267	5650	4014	1.7
CD (at 5% level)	0.1	-	-	-	1.7	-	-	-

KVK South 24 Parganas

Title: Efficacy of external application of some synthetic plant hormones for induction of femaleness in papaya

Papaya is a very remunerative fruit crop for the poor farmers of South 24 Parganas district. Papaya is usually propagated through seeds, where sex expression of the seedlings is a problem. There are equal chances of development of male plant and female plant from the seedlings. There are no ways of identifying male plant or female plant at the seedling stage, it is only observed when the plants bear flower. Maleness/ femaleness of a plant is regulated by plant hormones, which may be manipulated through external application of synthetic plant hormones. More number of female plant in the main field secures high return for the farmers, where as more male plants causes huge loss. In order to induce femaleness in papaya through application of synthetic plant hormones, a trial was conducted by KVK Nimpith of South 24 Parganas at 10 different locations. The trial showed that Technology option-I (Application of GA3 @ 25 ppm at 45 and 75 days after transplanting) resulted in highest female plant population in the main field and better yield/ha. Farmers had also shown their interest in such trials. Many farmers, who have left papaya farming due to maleness problem, are eager to accept the findings of this trial.

Table: Efficacy of external application of some synthetic plant hormones for induction of femaleness in papaya

Technology option	Yield component			Yield (q/ha)	Cost of cultivation (Rs/ha/ year)	Net return (Rs/ha/ year)	BC ratio
	Plant height at 150 days after planting	Days to 50% flowering	Female / Male plant ratio in the main field				
FP: Use of bold, black seed of Papaya (Var. Honey Dew) for seedling raising. No other treatment.	186.7	112.6	0.9	616	147500	160500	2.1
TO-I: Spraying of GA3 @ 25 ppm twice at 45 and 75 days after transplanting.	179.4	89.4	1.4	937	151100	317400	3.1
TO-II: Spraying of NAA@ 100 ppm twice at 45 and 75 days after transplanting.	Plant scorched after NAA application. The problem was discussed with Prof. Mitra. He suggested to lower the dose of NAA @ 50 ppm.						
TO-III: Spraying of Ethrel @ 500 ppm twice at 45 and 75 days after transplanting.	192.1	107.2	1.2	894	151100	295900	3.0
CD (at 5% level)	4.9	10.6	0.1	23.7	-	-	-

KVK West Midnapore

Title: Feasibility assessment of paddle operated groundnut stripper-cum-decorticator

Problems of higher cost of production and less output in groundnut under irrigated medium land condition of West Midnapore district during rabi-summer season were attempted to be solved through use of improved stripper-cum- decorticator. The trial was conducted at 7 different locations to assess the feasibility of paddle operated groundnut stripper-cum-decorticator. The stripping as well as decortications by Groundnut stripper-cum-decorticator was found to be beneficial in terms of output, man-hour requirement, and cost of operation and green stripped plants be used as fodder. For stripping and decortications of groundnuts production,20 q/ha with the help of pedal operated groundnut stripper cum decorticators, man-hrs/ha against stripping as well as decortications would be reduced by 90-95 % with effortless stripping and minimal breakage of kernel. The cost of decortications operation was Rs.25/q as compared to the same for Rs.32/q by hand operated decorticator and Rs.380/q manually.

Table: Feasibility assessment of paddle operated groundnut Striper cum decorticator

Technology Option	Output capacity (kg/h) in Stripping	Man-hr/ ha in Stripping	Cost of operation (Rs/ha) in Stripping	Output capacity (kg/ha) in Decortications	Man-hr/ha in decortications	Unit cost of operation (Rs/q) in Decortications
FP: Manual	2.5	840	15226	5.0	403	380
TO-I:Groundnut Stripper cum decorticator (Paddle operated)	65	31	579	75	26	25
TO-II:Stripping by hand and decorticating by groundnut decorticator. (Hand operated)	2.5	840	15226	60	33	31

Jharkhand

KVK Bokaro

Title: Management of predators in kusumi lac cultivation

Low productivity in Kusumi lac due to damage by predators is a major problem of lac growers of Bokaro district. For effective management of predators, a trial was carried out at 8 different locations and the results showed that Technology Option-3 (Ethonfenprox 10 Ec + Nylon net (60 mesh)) gave the best results in terms of no. of predators per m encrustation, yield, economic return and BC ratio.

Table: Effect of different control measures on incidence of predators and yield attributes of lac

Technological options	No. of predators/m encrustation						Yield (in kg/5 plant)	Cost of cultivation (Rs. /5plant)	Net return (Rs. /5plant)	BC ratio
	1st spray- 25 day		2nd spray- 40 day		3rd spray- 60 day					
	E. amabilis	P. pulverea	E. amabilis	P. pulverea	E. amabilis	P. pulverea				
FP: No predator management	27.0	33.0	36.0	40.0	22.0	41.0	20	2940	9928	4.4
TO-I: 3 spray of Ethonfenprox 10 Ec @ 2ml/l	19.0	27.5	13.5	14.0	10.5	8.0	50	3700	27432	8.3
TO-II: Nylon net (60 mesh)	21.0	30.0	17.5	13.5	12.5	11.0	45	3760	24432	7.6
TO-III: Ethonfenprox 10 Ec @ 2ml/l + Nylon net (60 mesh)	15.0	23.0	10.5	16.0	7.5	6.0	65	4060	36232	9.8

Note: Sale price of lac @ Rs. 400/kg

KVK Godda

Title: Effect of azolla feeding on performance of the pigs growth

Problems of low protein, vitamins and antioxidant contents of natural feeds and availability of very meagre land for green fodder production in Godda district were addressed by KVK Godda through carrying out a trial. An on-farm trial at 10 locations with soyabean oil incorporated in pig feed along with azolla was conducted over a period of 10 months following RBD with four treatment modules. The maximum body weight and meat yield were recorded in pigs which were fed maize 68.4%, soybean meal 18.6%, frozen fried soybean meal 6.5%, soybean oil 2.5%, Di-calcium phosphate 2%, Mineral powder 1.4%, salt 0.5% , methionine + cystine 0.01% + additives (indo mix K) + 500 (g) azolla and this treatment also gave maximum return in respect of BC ratio

Table: Effect of azolla feeding on performance of the pigs' growth

Technology option	Change body wt. (kg) during trial	Meat yield/ pig (kg)	Cost of feeding (Rs/pig)	Final Cost (Rs/pig)	Net Return	BC ratio
FP: Feeding any easily available materials	41.5	37.3	1468	2468	1568.9	1.5
TO-I*: Maize 68.4%,SBM 18.6%,FFSB 6.5%,soybean oil 2.5%,DCP2%,Mineral powder 1.4% ,salt 0.5%, methionine+ cystine 0.01% + additives (indo mix K)+250 (g) azolla	80.0	73.0	4335	6335	5713.3	1.9
TO-II: Maize 68.4%,SBM 18.6%,FFSB 6.5%,soybean oil 2.5%,DCP2%,Mineral powder 1.4% ,salt 0.5% ,methionine+ cystine 0.01% + additives (indo mix K)+ 350 (g) azolla.	84.5	76.5	4440	6440	6174.3	2.0
TO-III: Maize 68.4%,SBM 18.6%,FFSB 6.5%, soybean oil 2.5%, DCP 2%, Mineral powder 1.4%, salt 0.5% ,methionine + cystine 0.01% + additives (indo mix K) + 500 (g) azolla.	89.5	81.0	4632	6632	6726.4	2.0
CD (at 5% level)	17.6	11.4	-	-	-	-

* SBM: soybean meal; FFSB: frozen fried soybean meal; DCP: Di-calcium phosphate.

KVK Gumla

Title: Canopy management in mango

Poor fruiting in mango is a problem of mango producers of Gumla district. To address this issue, a field experiment was conducted by KVK Gumla at 10 different locations with objectives to find out the suitable canopy management practices in mango, to enhance the no. of fruit and fruit setting per panicle. The data collected during the trial was analyzed and the results clearly indicated that technology option-II (i.e. open centre pruning) produced maximum yield. The maximum BC ratio of 4.19 was also found under the same treatment. The per cent yield enhancement due to open centre pruning and side pruning over FP was to the tune of 23.5 and 10.2, respectively.

Table: Performance of various *canopy management practices* in mango

Technology option	No. of fruit/ panicle	Yield components		Yield (q/ha)	Cost of cultivation (Rs/ha)	Net income (Rs/ha)	BC ratio
		No. of fruit set/panicle	Fruit wt (gm)/plant				
FP: No pruning	50.7	2.1	136.6	108.9	37500	93192	3.5
TO-I: Side pruning	63.4	3.1	163.1	122.1	38000	109288	3.9
TO-II: Open centre pruning	68.9	3.8	209.5	134.6	38500	122960	4.2
CD (at 5% level)	8.9	0.3	13.5	16.3	--	--	--

KVK Lohardaga

Title: Performance assessment of different ragi varieties

To introduce new cropping pattern into the upland rice based production system, a varietal evaluation trial on the performance of different ragi varieties was conducted at ten locations. The result of the trial revealed that BBM-10 variety of ragi was the best among the varieties included in trial in terms of yield and economic parameters.

Table: Yield and economic performance of various ragi varieties

Technology option	Yield component		Yield (q/ha)	Cost of cultivation (Rs/ha)	Net return (Rs/ha)	BC ratio
	No. of effective tillers/hill	No. of spikelet per panicle (Fingers)				
FP: Local variety (Laduwa)	2.4	4.5	16.3	12000	7560	1.6
TO-I: BM -2	4.6	7.0	23.4	15000	13080	1.9
TO-II: JWM	4.8	6.8	20.5	15000	9600	1.7
TO-III: BBM -10	6.6	6.4	25.8	15000	15960	2.0
CD (at 5% level)	-	-	0.7	-	-	-

KVK Palamu

Title: Efficacy of different pesticides on Ranginee brood lac in Ber (*Ziziphus mauritiana*) plant

Lac cultivation is the important crop for small and marginal farm families in Palamu diostrict. The farmers mostly transplanted the brood lac in ber plant and palash plant in kharif and rabi season but they do not use pesticides resulting in very poor economic return. In a trial, conducted at 10 different locations, the efficacy of different pesticides was studied. Results revealed that the application of endoksacarp 5 ml + Bavistin 2g/ 10 l of water after one month of transplanting of ranginee brood lac in ber plant was found to be the most cost effective and economical.

Table: Effect of different incecticides/pesticide on Ranginee brood lac

Technology Option	Parameter for assessment of application of insects				
	Damage % by insect attack	Average yield (kg/plant)	Cost of production (per plant)	Net return	BC ratio
FP: No insect control measures	60	1.8	160	107.0	1.7
TO-I: Endoksacarp 5 ml + Bavistin 2g/10 l of water	20	3.2	190	282.5	2.5
TO-II: Net + Bavistin 2gm/10 l of water	25	2.9	210	217.5	2.0

KVK Ranchi

Title: Performance of insecticidal control of lac insect predators in ber plant used for kusumi lac

Problems of yield loss due to lac insect predators and deterioration of brood lac quality in Ranchi district were addressed by KVK Ranchi through a trial conducted at 10 different locations. The results of the trial showed that Technological option-II registered the highest yield per tree.

Table: performance of insecticidal control of lac insect predators in Ber plant used for Kusumi lac

Technology option	Brood lac inoculation/ Plant (kg)	Pest incidence (%)	Yield of Brood lac/ tree (kg)	Quantity of scraped lac./ tree (kg)	Net income (Rs)	% of reduction in lac insect predators	BC ratio
FP: No use of insecticide	2	33.1	9.5	1.80	5100	-	5.2
TO-I:Ethofenprox 10% -30ml/15 liter of water Three time spray 30,60 and 90 days after inoculation of brood lac	2	13.1	18.2	0.50	10470	71.0	8.8
TO-II: Fipronil 5% SC-14ml & Carbendazim 50% WP-6g / 14lit. Ethofenprox 10% -28 ml/14 liter of water and Dichorvos 76% EC, 6 ml & Carbendazim 50% WP-6g / 14 lit of water Three time spray 30,60 and 90 days after inoculation of brood lac	2	9.1	21.5	0.39	12975	74.5	10.5

Bihar

KVK Banka

Title: Evaluation of different cowpea cultivars for fodder production

Farmers of Banka district do not get good yield and quality fodder for feeding their livestock due to lack of availability of fodder variety of cowpea. In order to overcome such problems, KVK Banka carried out a fodder production trial at 6 different locations of the district. The results of the trial showed that the highest net return and BC ratio were recorded with Kohinoor variety followed by EC-4216 of cowpea as fodder.

Table: Performance of different cowpea cultivars for fodder production

Technology option	Yield component		Fodder yield (q/ha)	Cost of cultivation (Rs/ha)	Net return (Rs/ha)	BC ratio
	Plant height (cm)	Crop duration (days)				
FP: Desi / local cultivar	70	50	70	29000	6000	1.2
TO-I: Kohinoor	165	80	132	30000	24800	1.9
TO-II: EC-4216	130	70	110	30000	15500	1.5
TO-III: BL-2	110	65	102	30000	12200	1.5

KVK Kaimur

Title: Assessment of intercropping of muskdana (*Abelmoschus moschatus*) with pigeon pea

Low net return with sole crop of pigeon pea triggered the search for a more profitable intercropping option. To address this issue, KVK Kaimur conducted a trial at 7 different locations. The results of the trial showed that Technology option-II (Pigeon pea + Muskdana) was the best because of higher LER and YER in terms of Pigeon pea equivalent. With this option, maximum net return obtained was Rs.93, 810 with BC ratio of 4.7 followed by Muskdana as sole crop (Technology option-I) having net return of Rs.77, 500/- with BC ratio of 3.5:1.

Table: Performance of intercropping of muskdana (*kasturi bhindi*) with pigeon pea

Technology	Yield (q/ha)	LER (land equivalent ratio)	Net Return (Rs/ha)	BC ratio
FP: Pigeon pea as sole crop	15.6	-	44280	3.5
TO-I: Cultivation of Muskdana as sole crop (TOI)	4.3	-	77500	3.5
TO-II: Pigeon pea + Muskdana	12.4 + 2.8 (29.8)	1.45	93810	4.7

Value in parenthesis indicates the yield of the intercropping system in terms of yield equivalent to pigeon pea.

KVK Kishanganj

Title: Effect of by-pass fat feeding for improving the productivity of dairy animal

The problems of low productivity, low fat content of milk, anestrous and repeat breeding are due to the traditional feeding system. Paddy straw and wheat straw are fed as a dry fodder throughout the year to milch animals because of the shortage of green fodder and concentrates. Due to limited availability of feeds, our animals, by and large, are not able to get sufficient energy from their diets, as per the requirement, for productive purposes, resulting in lower yield. During early stage of lactation, the animals are under negative energy balance. The problem can be easily overcome by feeding protected/bypass lipids. By protecting the lipids, these are protected from ruminal hydrolysis and bio-hydrogenation so that the fats are digested and absorbed in the lower tract. For this, a trial was conducted by KVK Kishanganj at 6 different locations involving milch animals. Through such supplementation of bypass fat not only energy intake was increased but also it was possible to increase unsaturated fatty acid content in milk. Such a supplementation of bypass fat to cow resulted in 0.6 -1.4 kg per day/ animals higher milk yield, also 0.58 to 0.63% higher milk fat percentage. The daily realizable receipt (Rs.) from sale of milk was Rs 43.90 and 59.30 higher in by-pass fat supplemented groups than farmer's practices group. The return over feed cost (Rs./day) also 29.80 and 38.30 was more in bypass fat supplemented groups than farmer's practices group. The net saving per cow during 90 days experimental feeding worked out as Rs. 2684.93 and 3493.077 over and above the cow reared on farm feeding schedule, on account of higher return over feed cost.

Table: Performance of milch cows fed with by-pass fat

Technology Option	Yield attributes							Gross Return (Rs)	Net return (Rs)		
	Avg. milk yield (kg)	Av. 4% FCM yield (kg)	Av. Fat (%)	Av. Fat yield (kg)	Av. daily feed cost (Rs)	Days to first post partum estrus (days)	Service per conception	Av. daily realizable receipt from sale of milk (Rs)	Return over feed cost (ROFC) (Rs)	Difference in ROFC over control (Rs)	% More ROFC over control (Rs)
FP: No feeding of by-pass fat	13.3	12.6	3.6	0.5	100	117.6	2.7	198.6	98.6	-	-
TO-I: 10 g by-pass fat / kg milk production (Avg. 130g / day / animals)	13.9	14.5	4.2	0.6	114	83.2	1.9	242.4	128.4	29.8	30.3
TO-II: 15 g by-pass fat / kg milk production (Avg. 200g / day/ animals	14.7	15.3	4.3	0.6	121	64.7	1.5	257.9	136.8	38.3	38.8

KVK Nalanda

Title: Performance evaluation of seed treatment with bio-fertilizer in wheat

Wheat is the most important food grain crop in this area. Low yield of wheat was observed due to insufficient supply of nutrients because farmers are not using bio-fertilizer for seed treatment. KVK, Nalanda conducted an on farm trail at 8 different locations to assess the performance of seed treatment with bio-fertilizer in wheat. It was clearly indicated from the trial that the highest yield (39.5 q/ha) was recorded in Tech. Option-2 (Wheat variety PBW –373+.seed treatment with Azotobactor + PSB (each 5 packet / ha). + 2/3 of Recommended dose of Fertilizer (N:P:K-120:60:40kg/ha)) in comparison to farmers' practice and BC ratio (2.34) was also highest in Tech. Option-2.

Table: Effect of seed treatment with bio-fertilizer in wheat

Technology option	Yield component		Yield (q/ha)	Cost of cultivation (Rs/ha)	Net return (Rs/ha)	BC ratio
	No. of panicle/plant	No. of grain/ panicle				
FP: Wheat variety PBW –373 +Recommended dose of Fertilizer (N:P:K- 120:60:40kg/ha)	8.0	27.6	30.9	21500	16300	1.8
TO-I: Wheat variety PBW–373 + seed treatment with Azotobactor + PSB (each 5 packet /ha) + 2/3 of recommended dose of fertilizer (N:P:K-120:60:40 kg/ha)	9.4	38.1	39.5	20600	27600	2.3
TO-II: Wheat variety PBW –373 + seed treatment with Azosprillum + PSB (each 5 packet / ha) + 2/3 of recommended dose of fertilizer (N:P:K-120:60:40 kg/ha)	8.6	32.6	34.8	20800	21800	2.0
CD (at 5% level)	-	-	2.8	-	-	-

KVK Rohtas

Title: Refinement of potato slicers used by women SHGs involved in potato chips making

In order to reduce the drudgery in making of potato chips by SHGs, KVK Rohtas attempted a refinement in existing potato slicers through conducting a trial on this aspect at 12 different locations. The results of the trial revealed that the potato slicers mounted on wooden frame (6 inches high) and slanting at one side at a height of 4 inches from ground floor provided maximum comfort and highest slicing efficiency.

Table: Performance of various types of potato slicers

Technology option	Indicators		
	Slicing time (Min / kg of potato)	Slicing efficiency (kg of potato/hr.)	Muscle Injury of palm (kg/ grip pressure)
FP: Slicers available in market without any stand (Angle of inclination; AOI= 180^{o})	5.0	12.0	15.0
TO-I: Slicers mounted on 6 inches high wooden frame and slanting at one side at a height of 2 inches from ground floor (AOI= 60^{o})	3.6	16.6	20.0
TO-II: Slicers mounted on 6 inches high wooden frame and slanting at one side at a height of 3 inches from ground floor (AOI= 30^{o})	3.7	16.4	28.0
TO-III: Slicers mounted on 6 inches high wooden frame and slanting at one side at a height of 4 inches from ground floor (AOI= 15^{o})	2.9	20.7	35.0

AOI: Angle of inclination

KVK Samastipur

Title: Intercropping with chilli for profit maximization

Chilli is vulnerable to disease and pest and it is a crop which is less remunerative when grown as sole crop. To address this issue, KVK Samastipur carried out a trial on various intercropping options with chilli at 10 different locations. The trial revealed that intercropping cauliflower with chilli (1:1) had the highest chilli equivalent yield (170 q/ha), net return (Rs. 94020 ha.) and BC ratio (2.23).

Table: Performance of different intercropping options with chilli

Technology options	Yield (q/ha)	Chilli equivalent yield	Cost of cultivation (Rs/ha)	Net return (Rs/ha)	BC ratio
FP: Chili as sole crop	110	110	71100	38900	1.5
TO-I: Chilli + cauliflower (1:1)	170	110 + 100	75980	94020	2.2
TO-II: Chilli + Coriander (1:3)	140	100 + 30	72480	67520	1.9

4.2. Frontline Demonstration

Frontline Demonstration is organized to highlight the latest technology in farmers' field. The technology varied from varietal demonstration, crop production technologies, crop protection technologies to full package demonstration. In the current year, emphasis was given on demonstrating oilseeds, pulses, cereals, vegetables, livestock, enterprise and implements.

Demonstration on sesame

Demonstration on mustard

4.2.1 Kharif oilseeds

Among the kharif oilseeds, groundnut was the leading oilseed crop with acreage of 34.5 ha. Jharkhand having larger share of 32.5 ha demonstration covering 218 farmers. Varieties demonstrated were T4-22, BAU 25, SG-99, GG-20. Main technologies demonstrated were seed treatment, bio-fertilizers etc. Second important oilseed crop in kharif was niger which was demonstrated mainly in Jharkhand (27.5 ha). Main varieties were Birsa Niger 1, Birsa Niger 3 and technologies demonstrated were varietal replacement, seed treatment etc.. The KVKs in Zone II have also initiated popularization of soybean in the eastern states . The area under soybean demonstration in Jharkhand was 11.7 ha and 2.0 ha in Bihar involving 128 farmers. The varieties put under demonstrations were Birsa Soybean-2 and JS 335.

Sesame, an important oilseed crop in kharif, was demonstrated in 19.0 ha covering 94 farmers. The varieties demonstrated were TKG-306, G-6, JTS-06 .

In total 99.7 ha was covered under kharif oilseeds covering 592 farmers. The yield increase was 33.3 to 40.2% in groundnut, 39.7 to 51.5% in niger, 50 to 144% in soybean and 57.1 to 61.4% in sesame.

Table: Demonstration on *Kharif* oilseeds

Sl. 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	Net Return	BC ratio	Gross cost	Net Return	BC ratio
1	Groundnut	Jharkhand	218	32.5	18.7	13.4	40.2	25125	33384	2.33	22199	18582	1.84
		West Bengal	7	2.0	13.6	10.2	33.3	26180	21420	1.82	19420	15260	1.79
		Total	225	34.5	16.2	11.8	37.2	25652	27402	2.07	20809	16921	1.81
2	Niger	Jharkhand	133	27.5	5.2	3.7	39.7	7865	8717	2.11	6763	5192	1.77
		West Bengal	12	5.0	4.2	2.7	51.5	12320	10090	1.82	5325	2175	1.41
		Total	145	32.5	4.7	3.2	44.7	10092	9404	1.93	6044	3684	1.61
3	Soybean	Bihar	10	2.0	18.0	12.0	50.0	18500	35500	2.92	16100	19900	2.24
		Jharkhand	118	11.7	27.5	11.3	144.1	23947	34315	2.43	13183	9800	1.74
		Total	128	13.7	22.8	11.6	95.6	21223	34908	2.64	14642	14850	2.01
4	Sesame	Bihar	13	10.0	3.7	2.4	57.1	11840	6758	1.57	10038	4188	1.42
		Jharkhand	81	9.0	3.6	2.2	61.4	3000	4128	2.38	3000	1840	1.61
		Total	94	19.0	3.6	2.3	59.1	7420	5443	1.73	6519	3014	1.46
Total kharif oilseed			**592**	**99.7**	**11.8**	**7.2**	**59.2**	**16097**	**19289**	**2.20**	**12003**	**9617**	**1.80**

4.2.2 Rabi Oilseeds

In the states like Bihar, Jharkhand and West Bengal, most preferred oil seed crop was mustard in rabi season. A total of 519.4 ha was covered out of 741.8 ha cover under demonstration in rabi oilseeds involving 2158 ffarmers. The important varieties demonstrated were Rajendra suflam, Pusa Mahak, Shivani, NC-1 etc. Apart from varieties, technologies like nutrient management, seed treatment, aphid management, sulfur nutrition were demonstrated to show best production of mustard in the states. The second important crop in terms of acreage was groundnut in West Bengal. The groundnut varieties TG-51, TAG-24, ICGV 91114, BAU-25 were demonstrated in 59.0 ha covering 247 farmers. Technologies like seed treatment, phosphorus, aphid management etc. were demonstrated to improve yield of rabi groundnut. Groundnut was also demonstrated in Bihar in 15.0 ha. Third important oilseed crop was sunflower in rabi season which was demonstrated in 44.5 ha. West Bengal having the highest area under sunflower in this zone and hybrid like DRSH-1, was demonstrated under this programme. The fourth important oilseed crop demonstrated was linseed in Jharkhand. The area coverage was 26.0 ha while number of farmers covered was 126. Linseed variety Subhra, Garima, Sekhar, Neelam were demonstrated alongwith full package and component technologies like varietal replacement, fertilizer management. Besides these, three oilseed crops like sesame in 54.8 ha, Toria in 26.0 ha and Castor in 5.0 ha. Were also demonstrated.

In total, coverage under rabi oilseeds demonstration was 741.8 ha and this has benefitted 3015 farmers. The yield improvement, with demonstrations was 26.4 to 38.5% in mustard, upto 85.5% in toria, 31.8 to 35.2% in sunflower, 37.2 to 38.5% in linseed, 19.3 to 43.5% in sesame up to 41% in groundnut and 46% in castor. Thus a total of 841.5 ha was covered under oilseed demonstration involving 3637 farmers.

Demonstration on groundnut

Table: Demonstration on *Rabi* oilseeds

Sl. 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	Net Return	BC ratio	Gross cost	Net Return	BC ratio
1	Mustard	Bihar	680	203.4	13.3	9.6	38.5	14438	25502	2.77	13011	13539	2.04
		Jharkhand	1048	213.1	10.2	7.4	36.7	30811	44564	2.45	11817	15716	2.33
		West Bengal	430	102.9	13.0	10.3	26.4	11411	13497	2.18	16545	14553	1.88
		Total	2158	519.4	12.1	9.1	33.5	18887	27854	2.47	13791	14603	2.06
2	Toria	Bihar	44	13.0	9.6	7.2	33.2	13394	20569	2.54	34244	46854	2.37
		Jharkhand	57	10.0	9.5	5.1	85.8	14657	23339	2.59	13526	9034	1.67
		Total	101	23.0	9.6	6.2	55.0	14025	21954	2.57	23885	27944	2.17
3	Sunflower	Bihar	20	5.5	17.3	12.8	35.2	18749	33151	2.77	17406	20994	2.21
		West Bengal	55	38.0	16.6	12.6	31.8	19518	22222	2.14	18465	13092	1.71
		A&N Islands	3	1.0	15.3	12.1	26.4	23150	18650	1.81	20100	12760	1.63
		Total	78	44.5	24.6	18.8	31.2	30709	37012	2.21	27986	23423	1.84
4	Linseed	Bihar	73	13.0	9.1	6.6	37.2	13509	24611	2.82	12645	17218	2.36
		Jharkhand	126	26.0	7.2	5.2	38.5	12100	2300	1.19	9300	1100	1.12
		Total	199	39.0	8.1	5.9	37.8	12804	13456	2.05	10973	9159	1.83
5	Sesame	Bihar	74	25.0	6.3	4.4	43.5	11670	16663	2.43	11268	8575	1.76
		West Bengal	158	29.8	10.8	9.1	19.3	12500	17450	2.40	11030	13430	2.22
		Total	232	54.8	8.5	6.7	27.2	12085	17057	2.41	11149	11003	1.99
6	Groundnut	Bihar	25	2.0	32.8	26.1	25.7	35275	44440	2.26	33400	17880	1.54
		West Bengal	247	59.0	32.0	22.7	41.0	22233	24610	2.11	32800	30870	1.94
		Total	272	61.0	64.8	48.8	32.8	57508	69050	2.20	66200	48750	1.74
	Castor	Bihar	5	0.1	18.4	12.6	46.0	9800	12280	2.25	9800	5320	1.54
		Total	5	0.1	18.4	12.6	46.0	9800	12280	2.25	9800	5320	1.54
Total rabi oilseed			**3045**	**741.8**	**20.9**	**15.4**	**37.6**	**22260**	**28380**	**2.27**	**23398**	**20029**	**1.86**

4.2.3 Kharif pulse

Redgram was the major kharif pulse demonstrated in Bihar and Jharkhand covering 115.0 ha and 123.7 ha, respectively. A meager area of only 7.0 ha was demonstrated in West Bengal. Total coverage of farmers was 1096. Redgram varieties like MAL-13, NDA-1, P-9, Malviya-13, Maruti, Birsa Arhar-1, Bahar, ICPL 871119, Pusa 8585 ware put under demonstration. Major technologies demonstrated in redgram were variety, bio-agent, disease management, seed treatment etc.

Blackgram was demonstrated in 56.2 ha involving 347 farmers. In Jharkhand Blackgram was demonstrated in 33.6 ha involving 144 farmers. In West Bengal it was demonstrated in 20.6 ha involving 198 farmers. Main varieties were PU 304, PU-19, WBL-108 and technology demonstrated were variety, ICM, INM, disease management etc.

Horsegram was demonstrated in 7.0 ha involving 24 farmers in Bihar and West Bengal. Total area coverage in kharif pulse was 308.9 ha which was benefitted 1467 farmers.

Demonstration conducted resulted in increase in yield 42.9 to 52.9% and 20 to 190% in horsegram.

Table: Demonstration on *Kharif* pulses

Sl. 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	Net Return	BCR	Gross cost	Net Return	BCR
Kharif puslses													
1	Redgram	Bihar	473	115.0	17.1	11.9	42.9	17421	46854	3.69	14547	30705	3.11
		Jharkhand	586	123.7	15.3	10.0	52.9	16882	108828	7.45	17209	62773	4.65
		West Bengal	37	7.0	12.3	8.5	45.3	129712	138740	2.07	62116	52534	1.85
		Total	1096	245.7	14.9	10.1	46.9	54672	98141	2.80	31291	48671	2.56
2	Blackgram	Jharkhand	144	33.6	11.3	7.2	58.4	13550	22752	2.68	13014	10570	1.81
		West Bengal	198	20.6	9.0	6.6	36.8	6684	13082	2.96	25448	51707	3.03
		A&N Islands	5	2.0	6.2	4.8	29.2	9750	11950	2.23	9750	7050	1.72
		Total	347	56.2	8.9	6.2	43.1	9995	15928	2.59	16071	23109	2.44
3	Horsegram	Bihar	12	5.0	8.7	3.0	190.0	4000	8050	3.01	2500	3700	2.48
		West Bengal	12	2.0	5.1	4.3	20.0	101315	102685	2.01	85595	75905	1.89
		Total	24	7.0	6.9	3.6	90.3	52658	55368	2.05	44048	39803	1.90
		Total kharif pulse	**1467**	**308.9**	**10.2**	**6.6**	**60.1**	**39108**	**56479**	**2.44**	**30470**	**37194**	**2.22**

Demonstration on redgram

Demonstration on wheat

4.2.4 Rabi pulse

In rabi season, pulses like lentil, chickpea, greengram and pea were demonstrated in 737.0 ha area involving 2577 farmers.

Lentil was major crop under demonstration. It covered 309.3 ha in Bihar, 71.0 ha in Jharkhand and 26.6 ha in West Bengal. Total area under lentil was 416.3 ha and farmers involved were 1287. Major varieties demonstrated were HUL-57, DPL-62, KLS 218, WBL-77, WBL-58, Subrata etc. Technologies like seed management, fertilizer management, zero tillage, plant protection etc. were also demonstrated by the KVKs.

Chickpea, a major rabi pulse in Bihar and Jharkhand. Demonstration was put in 133.3 ha involving 473 farmers. The area in Bihar was 50.0 ha. Chickpea varieties like KPG-59, GG-4, Pusa 362 were popularized through demonstration for the benefit of the farmers.

In this year thrust was given to demonstration of greengram in Bihar. The coverage was 102.2 ha in Bihar out of 140.2 in the zone. Major varieties like SML-668, PDM-139, PDM-84, HUM-16 were demonstrated and technologies like integrated Crop Management , weed management were

put under demonstration. Pea was also demonstrated in 50.5 ha mainly in Bihar. Results showed , percentage yield increase was 21.5 to 38.0 in lentil, 35.8 to 38.5 in chickpea, 29.4 to 36.5 in green gram and 24.1 to 43.2 in pea. The total demonstration in pulse was 1145.9 ha involving 4044 farmers.

Table: Demonstration on *rabi* pulses

Sl. 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	Net Return	BCR	Gross cost	Net Return	BCR
1	Lentil	Bihar	816	309.3	14.3	10.9	31.0	17655	27095	2.53	21114	12155	1.58
		Jharkhand	249	71.0	15.0	10.9	38.0	35312	147793	5.19	31858	74685	3.34
		West Bengal	222	26.6	11.3	9.3	21.5	125853	127019	2.01	88793	73104	1.82
		Total	1287	406.9	13.5	10.3	30.6	59607	100635	2.69	47255	53314	2.13
2	Chickpea	Bihar	167	50.5	17.4	12.8	35.8	23139	27472	2.19	21289	15467	1.73
		Jharkhand	306	82.8	29.6	21.4	38.5	20155	34607	2.72	17989	21351	2.19
		Total	473	133.3	23.5	17.1	37.5	21647	31039	2.43	19639	18409	1.94
3	Greengram	Bihar	344	102.2	10.7	8.0	34.0	25047	13926	1.56	11973	15180	2.27
		Jharkhand	122	32.0	11.2	8.2	36.5	21167	24022	2.13	19033	14077	1.74
		West Bengal	67	10.0	8.4	6.5	29.2	14500	12960	1.89	13800	8500	1.62
		A&N Islands	8	2.1	3.4	2.7	29.4	7625	10500	2.38	7375	7300	1.99
		Total	541	146.3	8.4	6.3	33.1	17085	15352	1.90	13045	11264	1.86
4	Pea	Bihar	231	39.7	89.4	72.0	24.1	40433	33635	1.83	37267	20172	1.54
		Jharkhand	30	10.3	80.8	56.4	43.2	40767	104667	3.57	38767	62067	2.60
		West Bengal	15	0.5	15.4	12.1	27.3	18200	28600	2.57	16400	12700	1.77
		Total	276	50.5	92.8	70.3	32.0	49700	83451	2.68	46217	47469	2.03
		Total rabi pulse	**2577**	**737.0**	**34.6**	**26.0**	**33.3**	**37010**	**57619**	**2.56**	**31539**	**32614**	**2.03**

4.2.5 Other crops

Apart from oilseeds and pulses, emphasis was given towards demonstration on latest varieties and technologies in paddy, maize, brinjal, tomato, potato, cotton, cauliflower, elephant foot yam, turmeric and other crops. In the present year 4869.96 ha was covered involving 15915 farmers. Emphasis was also given in demonstration on hybrid, new varieties crop production and protection technologies. Paddy was demonstrated in 1399.6 ha involving 5258 farmers in Bihar. This includes demonstration under NFSM and other agencies. In Jharkhand area coverage was 302.0 ha involving 1048 farmers and in West Bengal demonstration was made in 155 ha involving 189 farmers. Total coverage in the current year under paddy was 1857.7 ha involving 7087 farmers. Major varieties demonstrated was Rajdndra Sweta, Sahabhagi, PHB71, Swarna Sub-1, Rajendra Suhasini, Rajshree, Prabhat MTU 1010, Pusa Basmati 1121, Abhisekh, Naveen and Lalat.. Technologies like brown manuring, direct seed rice, nutrient management were demonstrated to improve yield of rice.

In wheat, a major cereal in Eastern states was demonstrated in 647.2 ha involving 1735 farmers. Out of this major demonstration was conducted in Bihar (400.4 ha) and Jharkhand (213.8 ha). Important varieties introduced through demonstration were HD 2733, HW 2045, DBW-14, K-307, HD 2824, PBW-468, K-9107, PBW-353. Technologies like varietal replacement, zero tillage, micro nutrient, disease management, bio control, zero tillage, FIRB planting, micro nutrient were demonstrated.

Maize, was demonstrated in 336.4 ha involving 872 farmers. Among the demonstration hybrids like HPQM1,2, KA-2, DHM-117, HQPM-5, P 3441 were prominent. Jharkhand

Demonstration on wheat

Demonstration on paddy

was the highest (192.5 ha) in demonstration of maize hybrid, followed by Bihar (119.2 ha).

Cotton was also demonstrated in Bihar (40.8 ha) and West Bengal (30.8 ha). Vegetables like brinjal, tomato, potato, cauliflower, elephant foot yam and spices like turmeric were demonstrated in 79.5 ha, 67.0 ha, 21.4 ha, 629.7 ha, 4.55 ha and 5.31 ha, respectively. Out of these cauliflower was demonstrated in large scale in Jharkhand (614.0 ha). The major varieties demonstrated were Sweta, Sabour etcSome other crops were also demonstrated in 1148.6 ha which include okra, pointed gourd, papaya, mango, radish, makhana etc.

Table : Demonstration on crops

Sl. 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	Net Return	BCR	Gross cost	Net Return	BCR
1	Paddy	Bihar	5258	1399.6	38.6	30.4	27.0	24330	27849	2.14	23923	18676	1.78
		Jharkhand	1048	302.0	34.7	25.6	35.6	25019	29659	2.19	25573	9139	1.36
		West Bengal	789	155.1	49.7	41.5	19.9	60497	41197	1.68	54508	26240	1.48
		A&N Islands	2	1.0	45.7	35.9	27.3	20650	28180	2.36	24250	14520	1.60
		Total	7097	1857.6	42.2	33.3	26.5	32624	31721	1.97	32064	17144	1.53
2	Wheat	Bihar	899	400.4	36.6	27.3	34.1	25163	21670	1.86	20603	14180	1.69
		Jharkhand	626	213.8	33.1	26.5	24.9	43683	60330	2.38	37971	28973	1.76
		West Bengal	210	33.0	30.9	26.1	18.3	112330	90923	1.81	82247	34522	1.42
		Total	1735	647.2	33.5	26.6	25.9	60392	57641	1.95	46940	25892	1.55
3	Maize	Bihar	287	119.2	98.4	74.0	33.0	28408	42077	2.48	21515	21620	2.00
		Jharkhand	449	192.5	523.5	394.8	32.6	24353	23878	1.98	15809	12994	1.82
		West Bengal	127	24.7	61.6	49.5	24.3	43224	30340	1.70	25792	10510	1.41

Sl. 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	Net Return	BCR	Gross cost	Net Return	BCR
		A&N Islands	9	2.1	25.7	17.4	47.9	13225	18215	2.38	1500	3000	3.00
		Total	872	338.5	177.3	133.9	32.4	27302	28627	2.05	16154	12031	1.74
4	Brinjal	Bihar	342	42.2	300.7	236.2	27.3	67075	287379	5.28	58325	115316	2.98
		Jharkhand	227	29.8	208.8	140.3	48.8	39250	74891	2.91	20014	8429	1.42
		West Bengal	68	7.5	248.6	205.6	20.9	49171	70944	2.44	77364	85811	2.11
		Total	637	79.5	252.7	194.0	30.2	51832	144404	3.79	51901	69852	2.35
5	Cotton	Bihar	102	40.8	31.8	21.4	48.8	19700	29640	2.50	18640	18800	2.01
		West Bengal	215	30.0	26.5	22.2	19.4	19450	14050	1.72	30963	12375	1.40
		Total	317	70.8	29.2	21.8	33.8	19575	21845	2.12	24801	15588	1.63
6	Tomato	Bihar	138	12.1	325.7	236.1	38.0	77939	243056	4.12	60145	131800	3.19
		Jharkhand	81	46.8	289.2	199.8	44.8	44258	82421	2.86	37862	8832	1.23
		West Bengal	61	8.1	421.5	351.8	19.8	29117	62433	3.14	75528	107223	2.42
		A&N Islands	1	0.01	56.0	35.0	60.0	16000	17780	2.11	12000	9000	1.75
		Total	281	66.9	273.1	205.6	32.8	41829	101422	3.42	46384	64214	2.38
7	Potato	Bihar	74	3.1	289.3	232.5	24.4	58195	91205	2.57	51575	47975	1.93
		Jharkhand	64	12.0	227.1	134.1	69.4	42805	123225	3.88	34825	62016	2.78
		West Bengal	49	6.3	339.5	200.0	69.8	110300	30604	1.28	121000	48560	1.40
		Total	187	21.4	285.3	188.9	51.1	70433	81678	2.16	69133	52850	1.76
8	Cauli-flower	Bihar	141	15.0	177.6	152.5	16.5	91688	186475	3.03	103725	85800	1.83
		Jharkhand	21	614.2	221.7	135.7	63.4	272320	952920	4.50	201267	465400	3.31
		West Bengal	6	0.5	250.3	180.5	38.7	22500	22500	2.00	18300	13700	1.75
		Total	168	629.7	216.5	156.2	38.6	128836	387298	4.01	107764	188300	2.75
9	Elephant footyam	Bihar	135	0.5	529.4	393.3	34.6	234157	327923	2.40	186717	196200	2.05
		Jharkhand	214	3.4	630.0	525.0	20.0	291000	531600	2.83	236000	434000	2.84
		West Bengal	72	0.6	622.0	319.3	94.8	226250	446083	2.97	184650	161907	1.88

Sl. 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	Net Return	BCR	Gross cost	Net Return	BCR
		A&N Islands	6	0.0	214.0	158.0	35.4	25000	20000	1.80	22000	9000	0.00
		Total	427	4.5	498.8	348.9	43.0	194102	331402	2.71	157342	200277	2.27
10	Turmeric	Bihar	40	0.7	382.2	300.1	27.3	95770	280555	3.93	88477	172465	2.95
		Jharkhand	55	2.6	202.2	143.0	41.4	198650	932350	5.69	159400	613100	4.85
		West Bengal	51	2.0	186.6	107.6	73.5	73200	92675	2.27	54738	39875	1.73
		A&N Islands	1	0.0	130.0	105.0	23.8	30000	19000	1.63	26000	15000	1.58
		Total	147	5.3	225.3	163.9	37.4	99405	331145	4.33	82154	210110	3.56
11	Others	Bihar	1182	310.1	257.4	171.8	49.8	57139	139731	3.45	37907	57485	2.52
		Jharkhand	923	175.0	191.0	121.6	57.0	45610	128887	3.83	36971	32933	1.89
		West Bengal	1911	653.5	471.4	338.8	39.1	124562	147654	2.19	72815	83534	2.15
		A&N Islands	31	10.0	91.2	59.5	53.4	11510	27249	3.37	7388	9460	2.28
		Total	4047	1148.6	252.7	172.9	46.1	59706	110880	2.86	38770	45853	2.18
Total other than FLD			15915	4869.9	207.9	149.7	38.9	71553	148150	3.07	61526	81633	2.33

4.3 Training

4.3.1 Practicing Farmers:

The development of agriculture, among other factors, depends on the appropriate application of improved agricultural practices by the farming community. The faster improvement of agriculture and allied technologies needs adequate knowledge and skill for its application in the actual field condition. Hence, providing knowledge and skill to the practicing farmers is pre-requisite in developing agriculture through adoption/application of advanced agricultural technologies. The farming community, on the other hand, depends for acquiring knowledge and skill to practice newer/ improved cultivation practices on various organizations of which KVKs are considered as the most trusted institutes where arrangements for providing knowledge and skill are made in a single premise. In fulfilling the aspiration of the farmers, the KVKs conducted 7532 number of courses in the identified areas of crop production, horticulture, soil health and fertility management, livestock production and management, home science/women empowerment, agricultural engineering, plant protection, fisheries, production of inputs at site, capacity building and group dynamics, agro-forestry and others. The courses organized in the mentioned thematic areas benefitted 220583 number of practicing farmers of which 52229 were farm women and rest 168354 were farmers. Among the thematic areas highest number of courses (1907) were offered in crop production for 55669 practicing farmers including farm women. The next important area was plant protection where 1131 courses were organized for 40654 practicing farmers and farm women followed by horticulture (1055 number of courses and 29896 participants), livestock production and management (762 courses for 21683 participants), home science/women empowerment (968 courses for 25769 participants), soil health and fertility management (536 courses for 15705 participants), agricultural engineering (507 courses for 12878 participants), capacity building and group dynamics (276 courses and 8282 participants), fisheries (188 courses and 4895 participants), production inputs at site (150 courses for 3914 participants) and

On campus training

others. The women farmers constituted 23.67% of the total participation though it varied from thematic area to thematic area. In home science/women empowerment thematic area, the participation of women was as high as 76.40% but in plant protection it was only 12.6%. The other areas where participation of women was noteworthy were horticulture, livestock production and management and fisheries. The details are given in the following Table.

Table: Training programme for farmers and farm women

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	1907	33465	3608	37073	8100	1976	10076	6379	2141	8520	47944	7725	55669
II. Horticulture	1055	16908	2498	19406	4483	944	5427	3556	1509	5065	24947	4951	29896
III. Soil Health and Fertility Management	536	9686	1445	11131	1758	362	2120	1679	775	2454	13123	2582	15705
IV. Livestock Production and Management	762	9743	2971	12714	2562	1432	3994	3056	1919	4975	15361	6322	21683
V. Home Science/ Women mpowerment	968	4062	12021	16083	907	5041	5948	1111	2627	3738	6080	19689	25769
VI. Agril. Engineering	507	8004	1244	9248	1607	582	2189	1017	422	1439	10628	2248	12878
VII. Plant Protection	1131	28144	3149	31293	5109	1107	6216	2280	865	3145	35533	5121	40654
VIII. Fisheries	188	2404	410	2814	1224	189	1413	518	150	668	4146	749	4895
IX. Production of Inputs at site	150	2272	524	2796	575	207	782	172	164	336	3019	895	3914
X. Capacity Building and Group Dynamics	278	4673	968	5641	1004	390	1394	915	332	1247	6592	1690	8282
XI Agro-forestry	16	305	34	339	52	18	70	71	14	85	428	66	494
XII. Others	34	279	85	364	94	13	107	180	93	273	553	191	744
Grand Total	7532	119945	28957	148902	27475	12261	39736	20934	11011	31945	168354	52229	220583

The participation of practicing farmers in various thematic areas of training has been further classified based on sub-thematic areas as presented below.

Crop Production: In crop production training programme, areas like weed management, resource conservation technology, cropping systems, crop diversification, integrated farming, water management, seed production, nursery management, integrated crop management, fodder production, production of organic inputs and others were covered by the KVKs. In order of courses offered integrated crop management, seed production, resource conservation technology, weed management, cropping systems, integrated farming, crop diversification, nursery management, water management, production of organic inputs and fodder production stand chronologically with 382, 251, 195, 193, 134, 105, 91, 74, 53 and 23 number of courses. However, various other areas related to cultivation of crops were also covered through conduct of 311 number of training programmes. In respect of participation, the order stands as integrated crop management, seed production, resource conservation technology, weed management, cropping systems, integrated farming, crop diversification, nursery management, water management, production of organic inputs and fodder production with the participation of 11368, 7095, 5775, 4798, 4088, 2997, 2909, 2867, 1846, 1424 and 623 number of farmers including farm women. Training programme conducted in other areas including cultivation of crops was also participated by 9877 practicing farmers and farm women.

Table: Training programme for farmers and farm women on crop production aspect

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
Crop Production													
Weed Management	193	3032	288	3320	846	116	962	395	121	516	4273	525	4798
Resource Conservation Technologies	195	3376	489	3865	931	306	1237	548	125	673	4855	920	5775
Cropping Systems	134	2617	272	2889	482	135	617	444	138	582	3543	545	4088
Crop Diversification	95	1950	170	2120	439	96	535	224	30	254	2613	296	2909
Integrated Farming	105	1067	199	1266	368	80	448	775	510	1285	2210	789	2999
Water management	74	1246	120	1366	234	68	302	142	36	178	1622	224	1846
Seed production	251	5123	479	5602	930	145	1075	351	67	418	6404	691	7095
Nursery management	91	1235	204	1439	487	376	863	426	139	565	2148	719	2867
Integrated Crop Management	382	6752	871	7623	1380	327	1707	1441	597	2038	9573	1795	11368
Fodder production	23	431	44	475	81	25	106	37	5	42	549	74	623
Production of organic inputs	53	864	142	1006	265	86	351	40	27	67	1169	255	1424
Others, (cultivation of crops)	311	5772	330	6102	1657	216	1873	1556	346	1902	8985	892	9877
TOTAL	1907	33465	3608	37073	8100	1976	10076	6379	2141	8520	47944	7725	55669

Vegetable crops: Seven sub-thematic areas namely, vegetable crops, fruits, ornamental plants, plantation crops, tuber crops, spices and medicinal and aromatic plants constitute the thematic area, horticulture. In vegetable crops 632 training programmes were conducted by the KVKs to benefit 17962 practicing farmers and farm women. The major areas covered were nursery raising (111 number of courses), off-season vegetables (91 courses), production of low volume and high value crops (60 courses), protective cultivation (50 courses) and others. In overall cultivation of vegetables 299 courses were also conducted by the KVKs. In respect of participation, nursery raising course was attended by 3255 farmers and farm women, off-season vegetables by 2611 participants, production of low volume and high value crops by 1583 participants, protective cultivation by 1374 participants and others. In overall cultivation of vegetables 8604 farmers and farm women also participated. The percentage of women participation in vegetable crops oriented training programmes was 20.65 with highest participation recorded in training programme on export potential vegetables (30.26%).

Table: Training programme for farmers and farm women on horticulture aspect

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
Horticulture													
Production of low volume and high value crops	60	851	239	1090	267	62	329	129	35	164	1247	336	1583
Off-season vegetables	91	1490	179	1669	415	58	473	321	148	469	2226	385	2611
Nursery raising	111	1540	416	1956	487	130	617	503	179	682	2530	725	3255
Exotic vegetables like Broccoli	3	63	8	71	8	1	9	18	0	18	89	9	98
Export potential vegetables	14	154	66	220	81	35	116	0	1	1	235	102	337
Grading and standardization	4	74	0	74	16	9	25	1	0	1	91	9	100
Protective cultivation (Green Houses, Shade Net etc.)	50	795	201	996	194	81	275	85	18	103	1074	300	1374
Others, if any (Cultivation of Vegetable)	299	5184	478	5662	1221	192	1413	990	539	1529	7395	1209	8604
TOTAL	632	10151	1587	11738	2689	568	3257	2047	920	2967	14887	3075	17962

Fruits: In training programme related to fruit cultivation, 236 courses were organized by the KVKs for the benefit of 6955 participants. The major areas covered were layout and management of orchards, cultivation of fruits, management of young plants/orchards, rejuvenation of old orchards, plant propagation techniques and others. In respect of participation, 1991 farmers and farm women took part in training programme on layout and management of orchards 1456 in cultivation of fruit, 1252 in management of young plants/orchards, 791 in plant propagation techniques, 627 in rejuvenation of old orchards and others. The overall participation of women was 13.54% with highest participation in the training programme on plant propagation techniques (15.17%).

Table: Training programme for farmers and farm women on horticulture aspect

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
Fruits													
Training and Pruning	1	7	7	14	4	6	10	0	1	1	11	14	25
Layout and Management of Orchards	69	1220	151	1371	260	36	296	211	113	324	1691	300	1991
Cultivation of Fruit	53	834	73	907	228	25	253	253	43	296	1315	141	1456
Management of young plants/ orchards	38	808	114	922	207	30	237	74	19	93	1089	163	1252
Rejuvenation of old orchards	23	416	43	459	64	4	68	69	31	100	549	78	627
Export potential fruits	3	74	0	74	17	0	17	0	0	0	91	0	91
Micro irrigation systems of orchards	5	93	8	101	11	1	12	2	0	2	106	9	115
Plant propagation techniques	27	541	67	608	101	34	135	29	19	48	671	120	791
Others	17	385	80	465	70	25	95	35	12	47	490	117	607
TOTAL	236	4378	543	4921	962	161	1123	673	238	911	6013	942	6955

Ornamental Plants: In this sub-thematic area 34 courses were organized to benefit 835 participants. Nursery management, propagation techniques of ornamental plants and other related areas of ornamental plant production were the major areas covered through the training programmes. The participation of women was to the extent of 21.9% in the training programmes.

Plantation Crops: The KVKs conducted 40 courses to train 1098 farmers and farm women in different aspect of plantation crops cultivation. Production and management technology was the major area where 32 courses were offered to 885 participants. However, in processing and value addition 76.08% of the total participants were farm women.

Tuber Crops: In this area 36 courses were conducted for 943 farmers and farm women. Production and management technology of tuber crops was the major area with 31 courses and 811 participants. The women constituted 19.30% of the total participants.

Spices: In production technology of spices 47 courses were offered to 1203 farmers and farm women. Production and management technology was the most important area with 39 courses and 1000 participants. Processing in value addition was another area where 203 participants took part. The average participation percentage of women was 17.20.

Medicinal and aromatic plants: In this area 30 courses were conducted by KVKs to train 900 participants out of which 197 were women and rest 703 men. Production and management technology was the major area where 17 courses were organized for 513 beneficiaries. In respect of participation in other areas, 155 took part in nursery management and 168 in other related areas. The participation of women in overall training programme was to the extent of 21.88%.

The details of courses organized and farmers and farm women participated in the training programmes on ornamental plants, plantation crops, tuber crops, spices and medicinal and aromatic plants are given in the following Tables.

Table: Training programme for farmers and farm women on Ornamental, Tuber crops , plantation crops, spices etc.

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
Ornamental Plants													
Nursery Management	12	178	19	197	31	1	32	14	15	29	223	35	258
Management of potted plants	1	0	0	0	0	0	0	0	15	15	0	15	15
Export potential of ornamental plants	0	0	0	0	0	0	0	0	0	0	0	0	0
Propagation techniques of Ornamental Plants	9	142	20	162	29	15	44	39	36	75	210	71	281
Others, if any	12	120	21	141	65	29	94	40	6	46	225	56	281
TOTAL	**34**	**440**	**60**	**500**	**125**	**45**	**170**	**93**	**72**	**165**	**658**	**177**	**835**
Plantation crops													
Production and Management technology	32	354	46	400	204	32	236	215	36	251	773	114	885
Processing and value addition	2	7	23	30	4	11	15	0	1	1	11	35	46
Others, if any	6	75	0	75	19	0	19	51	22	73	145	22	167
TOTAL	**40**	**436**	**69**	**505**	**227**	**43**	**270**	**266**	**59**	**325**	**929**	**171**	**1098**
Tuber crops													
Production and Management technology	31	413	48	461	123	16	139	130	81	211	666	145	811
Processing and value addition	4	41	18	59	14	9	23	10	10	20	65	37	102
Others, if any	1	25	0	25	5	0	5	0	0	0	30	0	30
TOTAL	**36**	**479**	**66**	**545**	**142**	**25**	**167**	**140**	**91**	**231**	**761**	**182**	**943**
Spices													
Production and Management technology	39	418	59	477	154	28	182	257	84	341	829	171	1000
Processing and value addition	8	133	8	141	29	22	51	5	6	11	167	36	203
TOTAL	**47**	**551**	**67**	**618**	**183**	**50**	**233**	**262**	**90**	**352**	**996**	**207**	**1203**

Medicinal and Aromatic Plants													
Nursery management	5	34	11	45	65	19	84	19	7	26	118	37	155
Production and management technology	17	307	66	373	55	22	77	35	28	63	397	116	513
Post harvest technology and value addition	2	28	18	46	10	8	18	0	0	0	38	26	64
Others, if any	6	104	11	115	25	3	28	21	4	25	150	18	168
TOTAL	**30**	**473**	**106**	**579**	**155**	**52**	**207**	**75**	**39**	**114**	**703**	**197**	**900**

Plant Protection: The thematic area plant protection was the third most important area as per courses conducted by the KVKs and participation of farmers and farm women recorded. In this aspect, 1131 courses were offered to benefit 40654 participants. Integrated pest management, integrated disease management, bio-control of pest and diseases and production of bio-control agents and bio-pesticides were the major areas where 605, 285, 59 and 21 number of courses were organized, respectively. In terms of participation 22004 farmers and farm women got benefit from the training on integrated pest management, 11341 from integrated disease management, 2057 from bio-control of pest and diseases and 542 from production of bio-control agents and bio-pesticides. Participation of women in plant protection related areas of training was recorded to the extent of 12.59%, the highest being the area of production of bio-control agents and bio-pesticides (20.11%). The following Table describes the details of courses organized and farmers and farm women participated.

Table: Training programme for farmers and farm women on plant protection aspect

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
Plant Protection													
Integrated Pest Management	605	16186	1652	17838	2459	433	2892	1033	241	1274	19678	2326	22004
Integrated Disease Management	285	7862	921	8783	1554	341	1895	446	217	663	9862	1479	11341
Bio-control of pests and diseases	59	1146	105	1251	304	138	442	206	158	364	1656	401	2057
Production of bio control agents and bio pesticides	21	332	60	392	76	47	123	25	2	27	433	109	542
Others	161	2618	411	3029	716	148	864	570	247	817	3904	806	4710
TOTAL	1131	28144	3149	31293	5109	1107	6216	2280	865	3145	35533	5121	40654

Home Science/Women Empowerment: In terms of training courses organized as well as participants took part, home science/women empowerment was the next important thematic area covered by KVKs of Zone-II. In this thematic area 968 courses were offered to 25769 participants out of which 19689 were women and 6080 were men. Areas covered included household food security by kitchen gardening and nutrition gardening income generating activities for empowerment of rural women, value addition, women and child care, rural crafts, storage loss minimization technique, gender mainstreaming through SHGs, minimization of nutrient loss in processing, design and development of low/minimum cost diet and others. Women participants dominated all the areas except in storage loss minimization technique where participation of male farmers was recorded to the extent of 43.58%. On an average 76.40% women constituted the total participants. The following Table describes the details of courses organized and farmers and farm women participated.

Table: Training programme for farmers and farm women on Home science and women empowerment aspect

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
Home Science/Women empowerment													
Household food security by kitchen gardening and nutrition gardening	94	404	1054	1458	119	532	651	313	373	686	836	1959	2795
Design and development of low/minimum cost diet	37	98	429	527	34	181	215	24	189	213	156	799	955
Designing and development for high nutrient efficiency diet	40	193	538	731	28	273	301	45	128	173	266	939	1205
Minimization of nutrient loss in processing	41	256	456	712	24	176	200	51	194	245	331	826	1157
Gender mainstreaming through SHGs	41	60	560	620	33	251	284	99	117	216	192	928	1120
Storage loss minimization techniques	59	565	600	1165	76	186	262	5	50	55	646	836	1482
Enterprise development	24	228	199	427	47	120	167	64	19	83	339	338	677
Value addition	191	698	2564	3262	196	987	1183	168	425	593	1062	3976	5038
Income generation activities for empowerment of rural Women	140	349	1889	2238	56	614	670	112	384	496	517	2887	3404
Location specific drudgery reduction technologies	33	232	376	608	73	140	213	32	97	129	337	613	950
Rural Crafts	51	38	735	773	20	176	196	9	38	47	67	949	1016
Women and child care	89	212	1122	1334	38	595	633	37	240	277	287	1957	2244
Others	128	729	1499	2228	163	810	973	152	373	525	1044	2682	3726
TOTAL	968	4062	12021	16083	907	5041	5948	1111	2627	3738	6080	19689	25769

On campus training

Livestock Production and Management: In order of importance, livestock production and management was the next important area where 762 courses were organized to benefit 21683 participants. The major areas covered were disease management in livestock (180 courses), diary management (132 courses), poultry management (115 courses), feed management (109 courses), piggery management (70 courses) and others. In goat farming as an other area of training was also covered through conducting 124 courses by the KVKs. The average participation of women was to the extent of 21.16% though highest participation was recorded in piggery management (42.29%). In goat farming, however, the participation from women farmer was 34.88%. The details are given in the following Table.

Table: Training programme for farmers and farm women on livestock production and management

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
Livestock Production and Management													
Dairy Management	132	2158	510	2668	420	212	632	302	111	413	2880	833	3713
Poultry Management	115	1137	638	1775	457	318	775	416	359	775	2010	1315	3325
Piggery Management	70	133	84	217	245	179	424	749	563	1312	1127	826	1953
Rabbit Management	4	30	0	30	20	0	20	14	6	20	64	6	70
Disease Management	180	3099	534	3633	537	210	747	623	255	878	4259	999	5258
Feed management	109	1651	410	2061	287	169	456	276	224	500	2214	803	3017
Production of quality animal products	28	224	125	349	58	90	148	164	60	224	446	275	721
Others, if any Goat farming	124	1311	670	1981	538	254	792	512	341	853	2361	1265	3626
TOTAL	762	9743	2971	12714	2562	1432	3994	3056	1919	4975	15361	6322	21683

Soil Health and Fertility Management: The areas like integrated nutrient management, soil fertility management, soil and water testing, production and use of organic inputs, micro-nutrient deficiency in crop, soil and water conservation, nutrient use efficiency etc. were covered through 536 training programmes for 15705 participants in soil health and fertility management oriented training programmes. Integrated nutrient management attracted the highest number of participants (4513) followed by soil fertility management (2541), soil and water testing (2357), production and use of organic inputs (2072), micro-nutrient deficiency in crop (1240) and others. The average participation of women was 16.44% with least participation in soil fertility management (11.53%). The details are given in the following Table.

Table: Training programme for farmers and farm women on Soil Health and Fertility Management aspect

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
Soil Health and Fertility Management													
Soil fertility management	87	1708	164	1872	336	53	389	204	76	280	2248	293	2541
Soil and Water Conservation	39	656	71	727	110	29	139	120	83	203	886	183	1069
Integrated Nutrient Management	150	2966	353	3319	485	85	570	445	179	624	3896	617	4513
Production and use of organic inputs	69	1063	212	1275	240	48	288	340	169	509	1643	429	2072
Management of Problematic soils	29	376	85	461	79	31	110	84	36	120	539	152	691
Micro nutrient deficiency in crops	39	669	234	903	126	33	159	110	68	178	905	335	1240
Nutrient Use Efficiency	24	405	47	452	52	7	59	102	25	127	559	79	638
Soil and Water Testing	77	1494	252	1746	231	66	297	209	105	314	1934	423	2357
Others	22	349	27	376	99	10	109	65	34	99	513	71	584
TOTAL	536	9686	1445	11131	1758	362	2120	1679	775	2454	13123	2582	15705

Agricultural Engineering: In this thematic area major emphasis was given on repair and maintenance of farm machinery implements, installation and maintenance of micro irrigation systems, post harvest technology, production of small tools and implements, use of plastic in farming practices, small scale process and value addition and other areas. Altogether 507 number of courses were conducted for the participation of 12878 farmers and farm women. Among the participants, 17.45% were women and the rest were men. The KVKs also organized 202 number of courses in other areas for the benefit of 4466 number of participants. The details are given in the following Table.

Table: Training programme for farmers and farm women on Agricultural Engineering aspect

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
Agril. Engineering													
Installation and maintenance of micro irrigation systems	55	940	221	1161	163	48	211	102	74	176	1205	343	1548
Use of Plastics in farming practices	20	329	72	401	70	20	90	55	28	83	454	120	574
Production of small tools and implements	34	484	72	556	167	81	248	85	43	128	736	196	932
Repair and maintenance of farm machinery and implements	140	2494	225	2719	558	101	659	289	43	332	3341	369	3710
Small scale processing and value addition	12	70	117	187	14	122	136	34	39	73	118	278	396
Post Harvest Technology	44	706	109	815	133	71	204	153	78	231	992	258	1252
Others	202	2981	428	3409	502	139	641	299	117	416	3782	684	4466
TOTAL	507	8004	1244	9248	1607	582	2189	1017	422	1439	10628	2248	12878

Capacity Building and Group Dynamics: This thematic area was considered to empower the farmers and farm women towards formation and management of SHGs, entrepreneurial development of farmers/youths, women legal rights, group dynamics, leadership development and others. The KVKs offered 278 courses on capacity building and group dynamics to train 8282 number of participants. In respect of participation, 20.40% women constituted the total participants. Considerable participation was recorded in formation and management of SHGs (2297), entrepreneurial development of farmers/youths (1851), women legal rights (1428), leadership development (1041) and group dynamics (904). The details are given in the following Table.

Table: Training programme for farmers and farm women on capacity and group dynamics aspect

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
X. Capacity Building and Group Dynamics	0	0	0	0	0	0	0	0	0	0	0	0	0
Leadership development	32	503	108	611	176	77	253	110	67	177	789	252	1041
Group dynamics	36	651	91	742	71	38	109	26	27	53	748	156	904

Formation and Management of SHGs	84	1307	331	1638	262	112	374	181	104	285	1750	547	2297
Mobilization of social capital	22	295	23	318	50	6	56	215	52	267	560	81	641
Entrepreneurial development of farmers/youths	60	1103	252	1355	229	103	332	134	30	164	1466	385	1851
WTO and IPR issues	4	51	21	72	28	5	33	13	2	15	92	28	120
Others, if any (Women Legal Rights)	40	763	142	905	188	49	237	236	50	286	1187	241	1428
TOTAL	278	4673	968	5641	1004	390	1394	915	332	1247	6592	1690	8282

Fisheries: The KVKs of Zone-II conducted 188 training programmes for the benefit of 4895 farmers and farm women in various aspects of fish production. Major areas covered under fisheries were composite fish culture (73 courses for 2037 participants), integrated fish farming (23 courses for 577 participants), carp fry and fingerling rearing (15 courses for 317 participants) and others. Participation from women farmers was recorded to the extent of 15.30%. Except in composite fish culture and integrated fish farming, the participation of women in all the sub-thematic areas was quite less. The details are given in the following Table.

Table: Training programme for farmers and farm women on fisheries aspect

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
Fisheries													
Integrated fish farming	23	252	59	311	132	28	160	70	36	106	454	123	577
Carp breeding and hatchery management	6	88	4	92	28	2	30	9	0	9	125	6	131
Carp fry and fingerling rearing	15	216	4	220	59	2	61	35	1	36	310	7	317
Composite fish culture	73	1087	210	1297	451	102	553	171	16	187	1709	328	2037
Hatchery management and culture of freshwater prawn	8	101	16	117	41	3	44	47	60	107	189	79	268
Breeding and culture of ornamental fishes	11	131	46	177	77	37	114	6	0	6	214	83	297
Portable plastic carp hatchery	0	0	0	0	0	0	0	0	0	0	0	0	0
Pen culture of fish and prawn	4	41	13	54	24	4	28	6	7	13	71	24	95
Shrimp farming	1	14	0	14	26	0	26	0	0	0	40	0	40
Edible oyster farming	0	0	0	0	0	0	0	0	0	0	0	0	0
Pearl culture	0	0	0	0	0	0	0	0	0	0	0	0	0
Fish processing and value addition	2	18	0	18	2	0	2	16	14	30	36	14	50
Others	45	456	58	514	384	11	395	158	16	174	998	85	1083
TOTAL	188	2404	410	2814	1224	189	1413	518	150	668	4146	749	4895

Production of Inputs at Site: With an aim to empower the farmers towards production of various agril. and non-agricultural commodities the KVKs also conducted 150 training programmes to train 3914 farmers and farmwomen. Seed production and vermicompost production were the two major areas covered through 92 and 31 number of courses for 2334 and 897 participants, respectively. The overall average participation of women was 22.86%. In rest of the areas, 1-4 number of courses were organized for 30 to 111 number of participants. However, 13 number of courses were also organized for 271 participants in other related areas. The following Table portrays the details of training courses organized and participants took part.

Table: Training programme for farmers and farm women on production of input at site

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
Production of Inputs at site													
Seed Production	92	1606	220	1826	296	135	431	64	13	77	1966	368	2334
Planting material production	0	0	0	0	0	0	0	0	0	0	0	0	0
Bio-agents production	0	0	0	0	0	0	0	0	0	0	0	0	0
Bio-pesticides production	2	49	0	49	10	0	10	0	0	0	59	0	59
Bio-fertilizer production	1	10	0	10	16	0	16	4	0	4	30	0	30
Vermi-compost production	31	376	207	583	168	38	206	75	33	108	619	278	897
Organic manures production	2	49	0	49	8	0	8	4	0	4	61	0	61
Production of fry and fingerlings	1	28	0	28	2	0	2	0	0	0	30	0	30
Production of Bee-colonies and wax sheets	2	25	31	56	5	5	10	0	0	0	30	36	66
Small tools and implements	2	15	13	28	10	4	14	6	7	13	31	24	55
Production of livestock feed and fodder	4	63	7	70	20	11	31	4	6	10	87	24	111
Production of fish feed	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	13	51	46	97	40	14	54	15	105	120	106	165	271
TOTAL	150	2272	524	2796	575	207	782	172	164	336	3019	895	3914

Agro-forestry: In agro-forestry related areas 16 courses were organized to benefit 494 farmers and farm women. Integrated farming system and production technologies were two major areas where 300 and 142 participants took part in the KVK organized training programmes. The participation of farm women was recorded to the extent of 13.66%. The details are presented in the following Table.

Table: Training programme for farmers and farm women on Agro-forestry aspect

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
Agro-forestry													
Production technologies	5	99	5	104	25	3	28	2	8	10	126	16	142
Nursery management	2	23	0	23	13	3	16	13	0	13	49	3	52
Integrated Farming Systems	9	183	29	212	14	12	26	56	6	62	253	47	300
TOTAL	16	305	34	339	52	18	70	71	14	85	428	66	494

Others: Apart from the above mentioned thematic areas, the KVKs of Zone-II also conducted 34 number of courses for 553 farmers and 191 farm women. These courses were organized on the specific requirements of the farming community. The details are given in the following Table.

Table: Training programme other desciplines

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
Others	34	279	85	364	94	13	107	180	93	273	553	191	744

4.3.2 Rural Youths

On and off-farm enterprise development is considered as a potential means in encouraging rural unemployed youths towards self-employment. Alongwith providing opportunity for employment and income generation, involvement in such enterprises also attracts the youths towards agriculture and allied sectors. However, technical, financial and managerial support needs to be ensured to motivate the youths to take up such ventures. The KVKs of Zone-II with an aim to bolster the youths planned and conducted enterprise-potential training programmes for a large number of rural youths to make them self-employed through their own efforts and acquired managerial and related skill. In the course of inculcating knowledge and skill, the KVKs conducted 1960 number of training programmes for the benefit of 49857 youths and girls during 2013-14. Among the participants, 40.67% were girls and rest (39.33%) were youths. The training programmes were participated by 36.25% youths from Scheduled Caste and Scheduled Tribe categories. In terms of courses offered by KVKs, 'mushroom production' was the most preferred area of training with 216 number of courses followed by seed production (145 number of courses), value addition (130 number of courses), integrated farming (91 number of courses), vermin culture (90 no. of courses), rural crafts (84 no. of courses), production of organic inputs (84 no. of courses) and others. An assessment of trend of participation indicates that most of the participants (5277 numbers) opted for mushroom production training programme followed by seed production (5089 numbers), value addition (3489 numbers), repair and maintenance of farm machinery and implements (2501 numbers), integrated farming (2277 numbers), vermiculture (2204 numbers), rural crafts (1831 numbers), production of

organic inputs (1818 numbers) and others. However, a good number of participants (2596 numbers) also opted for the training programme on enterprise development where 31 courses were offered. The KVKs also conducted 220 number of training programmes on various means of application of ICT in agriculture for the benefit of 5794 rural youths. In respect of participation of rural girls mushroom production, seed production, value addition, enterprise development, rural crafts and application of ICT in agriculture were the preferred areas with participation of 2550, 2095, 2198, 2157, 1791 and 2033 rural girls, respectively. The overall scenario indicates that rural girls are also coming forward to take up agriculture and allied sectors as the suitable alternatives for additional income and employment generation. The details are given in following Table.

Table: Training programme for rural youth

ON + OFF CAMPUS (Zone-II)													
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
Mushroom Production	216	1885	1697	3582	549	471	1020	293	382	675	2727	2550	5277
Bee-keeping	70	734	154	888	135	45	180	40	46	86	908	245	1153
Integrated farming	91	1238	285	1523	297	152	449	257	48	305	1792	485	2277
Seed production	145	2328	712	3040	479	1355	1834	187	28	215	2994	2095	5089
Production of organic inputs	84	976	265	1241	220	120	340	137	100	237	1333	485	1818
Planting material production	59	716	126	842	110	45	155	74	35	109	900	206	1106
Vermi-culture	90	1165	411	1576	274	68	342	202	84	286	1641	563	2204
Sericulture	5	43	32	75	3	18	21	6	10	16	52	60	112
Protected cultivation of vegetable crops	65	813	158	971	217	77	294	244	58	302	1274	293	1567
Commercial fruit production	35	468	38	506	62	6	68	35	33	68	565	77	642
Repair and maintenance of farm machinery and implements	100	1396	147	1543	347	113	460	346	152	498	2089	412	2501
Nursery Management of Horticulture crops	67	943	193	1136	274	85	359	85	21	106	1302	299	1601
Training and pruning of orchards	20	314	72	386	114	10	124	33	8	41	461	90	551
Value addition	130	784	1355	2139	189	383	572	318	460	778	1291	2198	3489
Production of quality animal products	7	100	42	142	21	8	29	0	0	0	121	50	171
Dairying	74	903	187	1090	280	41	321	188	32	220	1371	260	1631
Sheep and goat rearing	73	772	283	1055	187	158	345	117	91	208	1076	532	1608
Quail farming	1	19	2	21	4	0	4	0	0	0	23	2	25

Piggery	21	133	42	175	72	37	109	135	104	239	340	183	523
Rabbit farming	5	7	5	12	2	31	33	14	6	20	23	42	65
Poultry production	68	566	247	813	325	185	510	191	95	286	1082	527	1609
Ornamental fisheries	5	38	68	106	11	9	20	0	0	0	49	77	126
Enterprise development	31	353	279	632	46	1878	1924	40	0	40	439	2157	2596
Para vets	6	87	0	87	9	0	9	48	5	53	144	5	149
Para extension workers	6	115	0	115	24	0	24	0	0	0	139	0	139
Composite fish culture	37	382	274	656	205	58	263	72	30	102	659	362	1021
Cold water fisheries	0	0	0	0	0	0	0	0	0	0	0	0	0
Fish harvest and processing technology	7	60	61	121	15	17	32	26	15	41	101	93	194
Fry and fingerling rearing	14	153	3	156	111	0	111	2	0	2	267	3	270
Small scale processing	20	119	248	367	41	63	104	33	27	60	193	338	531
Post Harvest Technology	30	242	191	433	64	95	159	26	63	89	332	349	681
Tailoring and Stitching	74	10	1184	1194	7	207	214	0	98	98	17	1489	1506
Rural Crafts	84	78	1349	1427	16	284	300	18	86	104	112	1719	1831
Others, if any (ICT application in agriculture)	220	2375	1349	3724	720	466	1186	666	218	884	3761	2033	5794
TOTAL	1960	20315	11459	31774	5430	6485	11915	3833	2335	6168	29578	20279	49857

4.3.3 Extension Functionaries

Extension functionaries play an important role in disseminating agricultural and allied technologies among the farming community. However, State Extension Services alone are not able to fulfill the technology demand of the farmers nor information need of the farmers. Moreover, lack of exposure towards frontier areas of technology generation often prevented from providing up-to-date information and technology support to the farmers. The KVKs of Zone-II planned and conducted specific training programmes for extension functionaries with an aim to upgrade the knowledge and skill of such officials in frontier areas of technology generation and application. During last one year, 1030 number of courses were organized for the benefit of 30212 extension functionaries. The major areas covered were productivity enhancement of field crops, integrated pest management, integrated nutrient management, protected cultivation technology, care and maintenance of farm machinery and implements, management in farm animals, production and use of organic inputs, livestock feed and fodder production, formation and management of SHGs and others. The areas of training were decided as per the need of extension functionaries. Participation in the training programmes conducted for extension functionaries indicates that most of the participants took part in productivity enhancement in field crops training programme (174 courses and 5326 participants) followed by integrated pest management (145 courses and 4218 participants), management in farm animals (46 courses and 1671 participants), care and maintenance of farm machinery and implements (73 courses and 1666 participants), integrated nutrient management (64 courses and 1616 participants) and others. Besides, 218 number of courses were also organized by the KVKs for the benefit of 6642 participants apart from the identified thematic areas. The details are given in following Table.

Table: Training programme for extension functionaries

ON + OFF CAMPUS (Zone-II)													
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	174	4020	237	4257	576	89	665	353	51	404	4949	377	5326
Integrated Pest Management	145	3311	216	3527	429	66	495	156	40	196	3896	322	4218
Integrated Nutrient management	64	1261	66	1327	135	9	144	142	3	145	1538	78	1616
Rejuvenation of old orchards	36	801	35	836	112	14	126	65	0	65	978	49	1027
Protected cultivation technology	62	955	102	1057	130	20	150	202	6	208	1287	128	1415
Formation and Management of SHGs	26	314	133	447	44	28	72	29	50	79	387	211	598
Group Dynamics and farmers organization	13	283	7	290	39	0	39	52	6	58	374	13	387
Information networking among farmers	8	158	3	161	18	1	19	9	0	9	185	4	189
Capacity building for ICT application	14	227	24	251	48	1	49	125	18	143	400	43	443
Care and maintenance of farm machinery and implements	73	1258	86	1344	210	32	242	73	7	80	1541	125	1666
WTO and IPR issues	4	69	2	71	14	0	14	47	0	47	130	2	132
Management in farm animals	46	1014	24	1038	290	257	547	82	4	86	1386	285	1671
Livestock feed and fodder production	28	508	55	563	142	292	434	17	8	25	667	355	1022
Household food security	25	489	270	759	151	260	411	0	0	0	640	530	1170
Women and Child care	33	53	437	490	7	158	165	32	249	281	92	844	936
Low cost and nutrient efficient diet designing	13	170	75	245	40	28	68	5	0	5	215	103	318
Production and use of organic inputs	36	858	97	955	66	34	100	46	6	52	970	137	1107
Gender mainstreaming through SHGs	12	124	51	175	40	73	113	23	18	41	187	142	329
Others	218	3880	536	4416	965	183	1148	909	169	1078	5754	888	6642
TOTAL	1030	19753	2456	22209	3456	1545	5001	2367	635	3002	25576	4636	30212

4.3.4 Sponsored training programme

Outreach of KVKs of Zone-II in almost every corner of the district has not only helped the farming community in receiving need-based support and information back-up but also attracted different organizations engaged in agricultural development activities to come in close contact with KVKs. Visit and interaction with KVKs and farming community convinced them to solicit help and guidance from KVKs in better implementation of their plan of action. At the same time, the organizations felt it appropriate to utilize the expertise of KVKs in upbringing the knowledge and skill of their target beneficiary through HRD programmes of KVKs. As a fall out private, public, financial and other organizations sponsored training progrmmes to KVKs as per the requirement of their beneficiaries. In this process, the KVKs of Zone-II organized 2777 number of sponsored training programmes for the benefit of 74687 participants. The major areas covered by the KVKs were crop production and management, production and value addition, livestock and fishery, post-harvest technology and value addition, home science, agricultural extension and others. Among the identified thematic areas, highest number of courses (834) was offered in crop production and management for 48034 participants followed by livestock and fisheries (535 no.) for 3903 participants, production and value addition (229 no.) for 6990 beneficiaries and others.

State/Union Territory-wise classification of sponsored training programme organized indicates that KVK of A&N Islands conducted only one training programme on increasing production and productivity of crops for 14 participants sponsored by other organization. In respect of KVKs of Bihar, 2206 number of sponsored training programmes were organized to provide knowledge and skill to 62593 beneficiaries. Important thematic areas covered in terms of courses offered were crop production and management, livestock and fishery, production and value addition, farm machinery, capacity building and group dynamics and others. With regard to trend of participation, highest number of participation was recorded in crop production and management aspect (43774 no.), farm machinery (4823 no.), production and value addition (4223 no.), livestock and fishery (1985 no.) and others.

KVKs of Jharkhand, on the other hand, conducted 238 training programmes sponsored by other organizations for 5857 beneficiaries. In the case of Jharkhand also, crop production and management was the most preferred area with 100 number of courses and 2996 participants followed by production and value addition (95 no. of courses and 1498 participants), livestock and fisheries (23 no. of courses and 573 participants) and others.

In West Bengal, almost similar trend was observed in respect of conducting sponsored training programmes by the KVKs. However, in respect of participation, substantial variation was recorded. In crop production and management though highest number of courses (137) was organized but highest number of participants was recorded in the thematic area of livestock and fisheries (1345) against 1250 number of participants in crop production and management. In livestock and fishery, 49 numbers of courses was organized by the KVKs of West Bengal. Other areas covered through sponsored training were production and value addition (42 numbers of courses and 1269 number of participants), home science (18 courses and 745 participants) and others.

Table: Sponsored training conducted by Zone-II

Area of training	No. of courses	General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management										
Increasing production and productivity of crops	645	27383	6312	33695	7237	3573	10810	34620	9885	44505
Commercial production of vegetables	189	2289	235	2524	778	227	1005	3067	462	3529
Total	834	29672	6547	36219	8015	3800	11815	37687	10347	48034
Production and value addition										
Fruit Plants	82	651	137	788	251	139	390	902	276	1178
Ornamental plants	6	44	3	47	6	2	8	50	5	55
Spices crops	4	59	13	72	48	26	74	107	39	146

Area of training	No. of courses	General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Soil health and fertility management	16	1017	217	1234	468	119	587	1485	336	1821
Production of Inputs at site	1	21	0	21	11	0	11	32	0	32
Methods of protective cultivation	24	1466	164	1630	198	87	285	1664	251	1915
Others	96	760	120	880	714	249	963	1474	369	1843
Total	229	4018	654	4672	1696	622	2318	5714	1276	6990
Post harvest technology and value addition										
Processing and value addition	13	262	68	330	70	29	99	332	97	429
Others	29	263	30	293	105	65	170	368	95	463
Total	42	525	98	623	175	94	269	700	192	892
Farm machinery										
Farm machinery, tools and implements	42	4134	151	4285	539	91	630	4673	242	4915
Others	2	41	0	41	11	12	23	52	12	64
Total	44	4175	151	4326	550	103	653	4725	254	4979
Livestock and fisheries										
Livestock production and management	312	1125	258	1383	832	561	1393	1957	819	2776
Animal Nutrition Management	0	0	0	0	0	0	0	0	0	0
Animal Disease Management	201	12	0	12	218	200	418	230	200	430
Fisheries Nutrition	0	0	0	0	0	0	0	0	0	0
Fisheries Management	16	282	11	293	166	13	179	448	24	472
Others	6	77	20	97	107	21	128	184	41	225
Total	535	1496	289	1785	1323	795	2118	2819	1084	3903
Home Science										
Household nutritional security	17	152	267	419	45	229	274	197	496	693
Economic empowerment of women	6	9	89	98	38	129	167	47	218	265
Drudgery reduction of women	0	0	0	0	0	0	0	0	0	0
Others	5	0	61	61	0	54	54	0	115	115
Total	28	161	417	578	83	412	495	244	829	1073
Agricultural Extension										
Capacity Building and Group Dynamics	41	567	292	859	364	239	603	931	531	1462
Others	1024	3046	406	3452	2032	1870	3902	5078	2276	7354
Total	1065	3613	698	4311	2396	2109	4505	6009	2807	8816
GRAND TOTAL	2777	43660	8854	52514	14238	7935	22173	57898	16789	74687

4.3.5 Vocational training programme

Addressing unemployment problem of the rural youths as well as retaining them in agriculture has been one of the major accomplishments of the KVKs of the Zone-II. Based on the potential of agro-based enterprise in the district, the KVKs identified areas like crop production and management, integrated crop management, post-harvest technology and value addition, livestock and fisheries, income generating activities and agriculture extension to enable the youths to develop their own enterprise/consultancy as a source of their livelihood. In most of the cases, financial/credit institutions were associated to help the youths overcome their anxiety in the case of enterprise development.

Vocational courses being of longer duration provides ample opportunity to infuse skill, knowledge and confidence among the youths. The KVKs of Zone-II conducted 2501 number of vocational training programmes for 11727 rural youths including girls. The major areas of vocational training were income generating activities, livestock and fisheries, crop production and management, post harvest technology and value addition and integrated crop management. In income generating activities altogether 6536 youths participated out of which 4312 were men and rest 2224 were women. Tailoring and stitching was the area under income generating activities which attracted maximum number of courses (395) but mushroom cultivation was the proggramme where maximum number of participants (1323) took part. Other important areas in terms of courses organized were repair and maintenance of farm machinery and implements, nursery and grafting, seed production, vermicomposting etc. In terms of participation seed production (960 numbers), rural craft (929 numbers), vermicomposting (784 numbers), nursery and grafting (569 numbers) and others. In livestock and fisheries majority of the courses were organized in poultry farming (208), dairy farming (139) and composite fish culture (137). In respect of participation training on poultry farming attracted most number of participants (978) followed by dairy farming (773), sheep and goat rearing (414) and composite fish culture (266). In crop production and management, commercial food production and commercial vegetable production were two major areas with 159 and 40 courses offered by the KVKs. The fall out of the vocational courses enabled 2077 youths to become self-employed through development of 1332 units and enable 156 other youths to get employed elsewhere.

Participation of youths in vocational training organized by individual Union Territory/State indicates that the KVKs of A&N Islands organized three long duration vocational courses for 30 participants whereas KVKs of Bihar offered 1123 courses, 7357 rural youths. Income generating activities were the major areas for the KVKs of Bihar also with (841 courses and 4411 participants) followed by livestock and fisheries 129 courses for 1368 participants, post harvest technology and value addition (68 courses for 756 participants) and crop production and management (67 courses for 488 participants). Out of the trained youths 924 became self-employed with establishment of 706 numbers of units whereas 45 youths got employed elsewhere.

The pattern of participation of the youths of Jharkhand did not differ much as highest participation (998 numbers) was recorded in the area of income generating activities with 439 numbers of courses. Livestock and fisheries was the next important area (261 courses for 394 participants) followed by post harvest and value addition (26 courses and 271 participants). The KVKs of Jharkhand conducted 824 vocational courses to train 1713 youths including girls. In respect of self employment, 279 youths found employment through establishment of 180 different units and 29 youths were employed elsewhere. In the case of KVKs of West Bengal, 551 number of vocational courses were conducted for 2627 youths. Among the identified areas income generating activities were the most preferred areas where 258 courses were offered to 1097 youths. Livestock and fishery was the second most important thematic area of training where 199 courses were conducted to train 1005 youths. Crop production and management and integrated crop management were two other areas where participation of 231 and 106 youths was recorded, respectively.

Participation of girls in the vocational courses offered by the KVKs indicates that in the zone as a whole 29.01% of the total participants belonged to women category but the trend varied widely from state to state. In Bihar, only 22.7% of the participants were from the women folk. In West Bengal also higher percentage (35.2) of participation of girls was recorded. The trend is the indicative of the fact that girls are coming forward at a faster pace in search of on and off-farm livelihood opportunity. The KVKs and development departments need to concentrate more on providing adequate support to make the girls entrepreneurs in their own areas of preference.

Table: Vocational training conducted in Zone-II

ZPD – II (Voc Trg.) Details	No. of courses	No of Participants									Self employed after training			No. of persons employed else where
Area of Training		General			SC/ST			Grand Total			Type of units	No. of units	No. of persons employed	
		Male	Female	Total	Male	Female	Total	Male	Female	Total				
Crop production and management														
Commercial floriculture	10	28	0	28	13	0	13	41	0	41		6	6	0
Commercial fruit production	159	272	15	287	116	6	122	388	21	409		77	147	17
Commercial vegetable production	40	209	12	221	87	5	92	296	17	313		67	104	3
Total	209	509	27	536	216	11	227	725	38	763		150	257	20
Integrated crop management														
Organic farming	5	75	4	79	33	1	34	108	5	113		5	5	0
Others	34	142	4	146	59	1	60	201	5	206		3	3	0
Total	39	217	8	225	92	2	94	309	10	319		8	8	0
Post harvest technology and value addition														
Value addition	69	107	395	502	46	168	214	153	563	716		30	21	4
Others	36	218	37	255	93	16	109	311	53	364		2	2	2
Total	105	325	432	757	139	184	323	464	616	1080		32	23	6
Livestock and fisheries														
Dairy farming	139	514	30	544	217	12	229	731	42	773		62	99	4
Composite fish culture	137	176	12	188	73	5	78	249	17	266		64	87	19
Sheep and goat rearing	57	226	65	291	95	28	123	321	93	414		33	25	13
Piggery	29	54	41	95	23	18	41	77	59	136		34	29	2
Poultry farming	208	581	107	688	246	44	290	827	151	978		76	129	19
Others	19	138	2	140	59	1	60	197	3	200		35	35	8
Total	589	1689	257	1946	713	108	821	2402	365	2767		304	404	65
Income generation activities														
Vermicomposting	89	411	141	552	173	59	232	584	200	784		62	102	8
Production of bio-agents, bio-pesticides, bio-fertilizers etc.	4	74	0	74	31	0	31	105	0	105		0	0	0
Repair and maintenance of farm machinery and implements	215	220	21	241	93	9	102	313	30	343		69	170	9
Rural Crafts	67	433	218	651	185	93	278	618	311	929		1	3	0

Seed production	118	570	103	673	243	44	287	813	147	960		239	289	4
Sericulture	0	0	0	0	0	0	0	0	0	0		0	0	0
Mushroom cultivation	223	538	392	930	228	165	393	766	557	1323		118	146	1
Nursery, grafting etc.	152	317	81	398	136	35	171	453	116	569		81	379	10
Tailoring, stitching, embroidery, dying etc.	395	26	318	344	10	133	143	36	451	487		80	95	3
Agril. Para-workers, para-vet training	24	54	0	54	23	0	23	77	0	77		8	12	4
Others	254	384	289	673	163	123	286	547	412	959		174	173	26
Total	1541	3027	1563	4590	1285	661	1946	4312	2224	6536		832	1369	65
Agricultural Extension														
Capacity building and group dynamics	14	0	106	106	0	44	44	0	150	150		6	16	0
Others	4	78	0	78	34	0	34	112	0	112		0	0	0
Total	18	78	106	184	34	44	78	112	150	262		6	16	0
Grand Total	2501	5845	2393	8238	2479	1010	3489	8324	3403	11727		1332	2077	156

4.4 Extension Programmes

Conducting extension activities is considered as a potential means to enhance the outreach of KVKs in the far-flung areas of KVK districts where the farmers are not yet so much exposed towards scientific agriculture and livestock rearing practices. Accordingly, the KVKs are encouraged to conduct large number of extension activities to make the farmers aware of the KVKs as well as available technologies in the field of agriculture and allied succors. Keeping conformity with the mentioned postulate, the KVKs of Zone-II conducted 115984 number of various extension activities to reach out 684144 farmers and extension officials. Among the beneficiaries farmers constituted 660408 number of participants and 23758 were extension officials. Gender-wise classification indicates that 124476 number of women took part in various extension activities against 535932 number of farmers. In respect of extension officials, however, only 3225 members were women extension officials and rest 20533 was male extension officials. The overall participation trained indicates that nearly 19% of the total participants belonged to women category. In respect of programme organized, farmers' visit to KVK where 44582 number of programmes were organized by the KVKs to facilitate 78600 farmers and farmwomen to visit KVKs. Advisory service was the second most important programme for the KVKs who provided 38626 number of advisory services to 45475 number of farmers and farmwomen. The KVK personnel also paid visit 12326 times to the farmers' field to interact with 58323 numbers of farmers and farmwomen followed by 5988 times diagnostic visit to provide solution against crop/livestock related problem of 17551 number of farmers. The KVKs also extended their expertise through delivering 2960 number of lectures as resource person. Other important extension activities carried out by the KVKs include conducting kisan gosthi, field day, film show, method demonstration, group meeting, soil test campaign, self-help group mahila mandal and farm science club, conveners' meet, celebration of important days and others.

State-wise analysis of extension activities conducted by the KVKs indicates that the KVKs of Bihar carried out 77063 number of extension activities for the benefit of 272069 number of farmers, farmwomen and extension officials. Visit of farmers to KVK (30018 number), providing advisory services (28814 nuber), visit of scientists to farmers' field (6941 times), diagnostic visit (3043 times), kisan gosthi (968 number), soil test campaign (1165 times), film show (398 numbers), field day (301 number) and others. In respect of participation 35947 number of farmers visited KVKs, 31953 farmers received advisory services, 8357 number of farmers got their problems treated by the KVK personnel during diagnostic visit, 26862 number of farmers attended lecture of KVK personnel, 5795 number of farmers watched film show, 64782 number of farmers met in the KVK during kisan gosthi, 11923 farmers witnessed performance of crop during field day, 23909 number of farmers took part in kisan mela etc.

The KVKs of Jharkhand conducted 19057 number of various extension activities for 17139 number of farmers, farmwomen and extension officials. Major extension activities of the KVKs included farmers' visit to KVK,

advisory services, diagnostic visit, scientists visit to farmers' field, kisan gosthi, field day, film show, soil test camping etc. With regard to participation 21733 number of farmers were benefitted from the visit of KVK staff to their fields followed by visit of 18127 farmers in the KVKs. More than 40,000 farmers participated in the kisan mela and more than 14,000 farmers participated in kisan gosthi. During field day, nearly 9000 farmers were present whereas 10380 number of farmers attended the lecture of KVK personnel.

In organizing extension activities, the KVKs of West Bengal took up 18621 number of such activities for the benefit of 233073 number of farmers and extension personnel. In this state also highest number of activities (8261) was conducted in organizing farmers' visit to K VKs (8261) number of activity for 24336 number of farmers, providing advisory services to 6751 number of farmers through 4909 activity and diagnostic visit (1139 numbers) to provide agriculture and related problems to 3594 farmers. However, highest number of participants was recorded in kisan mela (84057 number) and exhibition (32376 number). More than 11,000 farmers and extension officials attended lecture of KVK personnel also.

For the KVKs of A&N Islands, visit of scientists to farmers' field, diagnostic visit and farmers' visit to KVKs were three major extension activities conducted by the KVKs. Altogether, 1243 number of various extension activities were conducted for the benefit of 7705 farmers and farmwomen. Advisory services and lecture delivered by KVK personnel followed by organizing film show were another three major activities with substantial number of participants.

Table: Extension activities conducted in Zone-II

Nature of Extension Activity	No. of activities	Farmers			Extension Officials			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Field Day	796	23347	5027	28374	1294	127	1421	24641	5154	29795
Kisan Mela	150	108003	37299	145302	4465	976	5441	112468	38275	150743
Kisan Ghosthi	1325	69535	9574	79109	3779	339	4118	73314	9913	83227
Exhibition	103	32139	9501	41640	1074	238	1312	33213	9739	42952
Film Show	925	17370	5839	23209	418	55	473	17788	5894	23682
Method Demonstrations	414	3847	1612	5459	156	50	206	4003	1662	5665
Farmers Seminar	81	5089	1675	6764	332	19	351	5421	1694	7115
Workshop	87	3547	737	4284	245	88	333	3792	825	4617
Group meetings	275	5478	1469	6947	420	57	477	5898	1526	7424
Lectures delivered as resource persons	2960	40808	6952	47760	1804	160	1964	42612	7112	49724
Advisory Services	38626	38047	6541	44588	744	143	887	38791	6684	45475
Scientific visit to farmers field	12326	47252	9847	57099	982	151	1133	48234	9998	58232
Farmers visit to KVK	44582	65581	11292	76873	1491	236	1727	67072	11528	78600
Diagnostic visits	5988	14675	2244	16919	570	62	632	15245	2306	17551
Exposure visits	249	5118	936	6054	405	67	472	5523	1003	6526
Ex-trainees Sammelan	32	1770	469	2239	56	4	60	1826	473	2299
Soil health Camp	66	2064	319	2383	242	27	269	2306	346	2652
Agri mobile clinic	23	600	50	650	0	0	0	600	50	650
Soil test campaigns	1241	3623	129	3752	29	3	32	3652	132	3784

Nature of Extension Activity	No. of activities	Farmers			Extension Officials			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Farm Science Club Conveners meet	104	2782	836	3618	340	58	398	3122	894	4016
Self Help Group Conveners meetings	107	1031	1901	2932	112	43	155	1143	1944	3087
Mahila Mandals Conveners meetings	61	264	619	883	34	26	60	298	645	943
Celebration of important days (specify)	237	5925	2538	8463	266	80	346	6191	2618	8809
Any Other	5226	38037	7070	45107	1275	216	1491	39312	7286	46598
Total	115984	535932	124476	660408	20533	3225	23758	556465	127701	684166

Table: Extension activities organized in different states

Nature of Extension Activity	No. of activities	A &N Islands			Bihar			Jharkhand			West Bengal		
		Farmers	EO	Total	Farmers	EO	Total	Farmers	EO	Total	Farmers	EO	Total
Field Day	11	257	0	257	11113	810	11923	8734	157	8891	8270	454	8724
Kisan Mela	1	2000	0	2000	22343	1566	23909	39303	1474	40777	81656	2401	84057
Kisan Ghosthi	6	150	0	150	61212	3570	64782	13624	457	14081	4123	91	4214
Exhibition	2	725	0	725	6459	435	6894	2903	54	2957	31553	823	32376
Film Show	29	383	0	383	5511	284	5795	4943	32	4975	12372	157	12529
Method Demonstrations	12	233	2	235	1497	60	1557	1482	33	1515	2247	111	2358
Farmers Seminar	0	0	0	0	3836	290	4126	451	4	455	2477	57	2534
Workshop	0	0	0	0	1726	172	1898	2251	39	2290	307	122	429
Group meetings	4	73	0	73	2849	102	2951	522	86	608	3503	289	3792
Lectures delivered as resource persons	43	1351	30	1381	25355	1507	26862	10274	106	10380	10780	321	11101
Advisory Services	72	85	21	106	31290	663	31953	6507	158	6665	6706	45	6751
Scientific visit to farmers field	665	1115	0	1115	17452	737	18189	21450	283	21733	17082	113	17195
Farmers visit to KVK	164	190	0	190	34761	1186	35947	17860	267	18127	24062	274	24336
Diagnostic visits	204	330	0	330	7890	467	8357	5145	125	5270	3554	40	3594
Exposure visits	12	225	0	225	3009	353	3362	1419	62	1481	1401	57	1458
Ex-trainees Sammelan	0	0	0	0	911	37	948	358	0	358	970	23	993
Soil health Camp	0	0	0	0	244	10	254	1187	202	1389	952	57	1009

Nature of Extension Activity	No. of activities	A &N Islands			Bihar			Jharkhand			West Bengal		
		Farmers	EO	Total	Farmers	EO	Total	Farmers	EO	Total	Farmers	EO	Total
Agri mobile clinic	0	0	0	0	0	0	0	0	0	0	650	0	650
Soil test campaigns	0	0	0	0	1340	16	1356	1295	0	1295	1117	16	1133
Farm Science Club Conveners meet	0	0	0	0	359	38	397	1748	80	1828	1511	280	1791
Self Help Group Conveners meetings	1	18	0	18	1078	79	1157	1198	74	1272	638	2	640
Mahila Mandals Conveners meetings	3	63	0	63	151	8	159	454	45	499	215	7	222
Celebration of important days (specify)	1	42	0	42	2126	85	2211	4306	184	4490	1989	77	2066
Any Other	13	391	21	412	16351	731	17082	19363	620	19983	9002	119	9121
Total	1243	7631	74	7705	258863	13206	272069	166777	4542	171319	227137	5936	233073

4.4.1 Other extension activities

The KVKs also opted for other means of communication like publishing through newspaper, radio/TV talk, writing popular article, preparing extension literature as well as organizing animal health camps. The KVKs of Zone-II conducted 16187 number of such extension activities for the benefit of 89850 number of farmers. The KVKs organized 229 animal health camp in the zone followed by distribution of 12529 extension literature depicting cultivation technique of crops, vegetables, fish rearing, livestock rearing etc. in local vernacular. Among all the states, KVKs of West Bengal organized 151 animal health camp where as KVKs of Bihar developed 7252 number of extension literature. Activities of KVKs of Bihar also were published through newspaper by 1920 times and the KVK personnel of Jharkhand delivered TV talk 231 times.

Table: Other Extension Activities organized in Zone-II

Bihar										
Nature of Extension Activity	No. of activities	Farmers			Extension Officials			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Newspaper coverage	1920									
Radio talks	80									
TV talks	114									
Popular articles	126									
Extension Literature	7252	36431	2645	39076	1669	85	1754	38100	2730	40830
Animal Health Camp	42	2228	306	2534	105	15	120	2333	321	2654
Total	9534	323020	4908	327928	2266	233	2499	325286	5141	330427

Jharkhand										
Nature of Extension Activity	No. of activities	Farmers			Extension Officials			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Newspaper coverage	650									
Radio talks	35									
TV talks	231									
Popular articles	19									
Extension Literature	5151	24990	2227	27217	20	8	28	25010	2235	27245
Animal Health Camp	34	944	643	1587	284	40	324	1228	683	1911
Total	6120	40964	8870	49834	2839	655	3494	43803	9525	53328

West Bengal										
Nature of Extension Activity	No. of activities	Farmers			Extension Officials			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Newspaper coverage	91									
Radio talks	63									
TV talks	77									
Popular articles	13									
Extension Literature	117	7985	3446	11431	547	162	709	8532	3608	12140
Animal Health Camp	151	3406	1503	4909	97	22	119	3503	1525	5028
Total	512	11770	5078	16848	684	186	870	12454	5264	17718

Zone - II										
Nature of Extension Activity	No. of activities	Farmers			Extension Officials			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Newspaper coverage	2663									
Radio talks	181									
TV talks	424									
Popular articles	161									
Extension Literature	12529	69406	8318	77724	2236	255	2491	71642	8573	80215
Animal Health Camp	229	6602	2470	9072	486	77	563	7088	2547	9635
Total	16187	375778	18874	394652	5789	1074	6863	381567	19948	401515

5.0 PRODUCTION OF SEED/ PLANTING MATERIAL AND BIO-PRODUCTS

5.1 Seed

Production of seed by KVKs (farm and village seed production): The KVKs of this zone produce quality seed, planting material and bio-products in their farm as well as in adopted villages. Seed produced by KVKs has led to enhancement of seed replacement ratio and consequently increasing productivity of crops. During 2013-14 the KVKs produced 118275.22 q seeds and distributed it among 64561 farmers. Paddy seed constitute alone constitute 59.4% of the total seed produced. Other cereal crop seed produced by KVKs are wheat and maize. Quantity of seed produced for wheat and maize was 6952.05 q and 47.11 q respectively. Seed produced for important oilseed crops viz., Mustard, Sesame and Ground nut was 540.21, 102.77 and 64.38 q respectively. Production of Lentil, red gram, chickpea, and green gram seeds was to the tune of 884.42, 790.12, 723.3 and 96.82 q respectively. Other major commodities for which KVKs produced quality seeds were wheat, tomato, potato, onion, chilli, elephant foot yam, turmeric, lentil, mustard etc. In state wise analysis , Bihar produced 58303.67 q, Jharkhand produced 26091.32 q and West Bengal produced 33880.16 q. Major varieties used for seed production programme were Paddy- Sita, MTU 7029, Rajendra Mahsoori, -1 Naveen ,Sahbhagi Rajendra Sweta Sahbhagi, R. Kasturi MTU 1010 MTU 1001 PD-12 PD-10 CR-1017 Pratiksha IR-36 Lalat Govindobhog GB-1 ,Wheat-HD2733, HD 2824, HI-1563 K.307,HD 2967,2985 PBW-443 ,Shatabdi, HW 2045,Mustard- Varuna, Rohini B-9 NC-1 B-54 PT-303 Pusa Mehak Pusa Bahar,Groundnut-TAG-24 Kadiri-6 TG-51 Narayani, Lentil- DPL-62, DPL-15,PL639, PL406 , Pusa Shivalik HUL-57, K-75,Chickpea- KWR108, Awrodhi, Uday Anuradha Samrat Kranti ,Redgram- MAL-13, MA-6,PRG158 NDA – 1,Greengram- PDM 84-139, Rajmash- PDR-14,Tomato- S-22, Navodaya, Lobia- Kashi Kanchan, Okra- Arka anamika The state-wise details of seed production has been provided in the following table

Table ; Seed production in different states

Crops	Bihar			Jharkhand			West Bengal			Total		
	Quantity (q)	Value (Rs.)	No. of Farmers	Quantity (q)	Value (Rs.)	No. of Farmers	Quantity (q)	Value (Rs.)	No. of Farmers	Quantity (q)	Value (Rs.)	No. of Farmers
Cereals	31012.4	10800855	9570	15205.95	31772477	23770	31147.23	17041436	16554	77365.58	59614768	49894
Oilseeds	138.52	517442	569	88.5	567570	1813	563.1	993785	6191	790.12	2078797	8573
Pulses	581.4	2965323.5	2198	553.9	2217800	347	803.4	636070	1280	1938.7	5819193.5	3825
Commercial Crops	1477.75	994300	16	0	0	0	796.34	65088	6	2274.09	1059388	22
Vegetables	22.3	247700	255	1.48	10250	222	9.98	33270	654	34404.9	361770	1287
Flower	23	450145	0	0.2	2400	32	3.41	12576	77	26.61	465121	109
Forest Sp.	1	3120	0	0	0	0	0	0	0	1	3120	0
Spices	0	0	0	11.25	47100	0	337.5	127400	38	348.75	186800	38
Fiber rops	0	0	0	0	0	0	17.25	27000	195	17.25	27000	195
Others	676.27	242210	132	230	638800	320	201.95	176000	166	1108.22	1057010	618
Total	33932.64	16221096	12740	16091.28	35256397	26504	33880.16	19112625	25161	118275.2	70672968	64561

5.2 Planting material

The KVKs produce planting materials of vegetable crops, fruits, plantation crops, forest spp. And other in a large scale. During 2013-14 the KVKs produced 31.80 lakhs planting material which is valued at Rs 191.12 lakhs. The KVKs raised 14.1 lakh vegetable seedlings (cauliflower, brinjal, tomato, chilli etc.) which constitute 44% of the total seed produced. In fruit crops the KVKs raised 3.84 lakhs seedlings of banana, mango, guava, lemon, papaya, aonla, jackfruit etc. production of planting material also included ornamental plants like Croton, Ashok, medicinal and aromatic plants, plantation crops, spices and condiments and forest species. The KVKs also produced planting materials for flower including marigold, tuberose, chrysanthemum and dahlia etc. In state-wise analysis, showed that Bihar produced 17.7 lakh, Jharkhand produced 5.2 lakh, West Bengal produced 8.87 lakh and A & N islands produced 0.085

lakh planting materials during the year. The total value of such materials was Rs. 19111761. the planting materials were supplied to 1.11 lakh farmers. Different varieties used in planting material production programme were Cauliflower- Snoball-16, Madhuri, Early Kuwari, Subhra Kartika, Agrani Girija, Cabbage- Pride of India, Golden Acre Summer queen, Pousali, Pushpa; Tomato- Navodaya, S-22, Swarn Lalima, Arun, Rupali, N.S.815, Laxmi S-22, JK-Deshi; Brinjal- Green long, Muktkeshi, Neelam Muktakeshi; Chilli- NS 1101(HYB),G-4, Pusa Jawala Suryamukhi, Bullet; Mango- Amrapali, Dushahari, Chausa, Bombay, Gulabkhas, Maldah, Loknayak, Alfanso, Mallika etc. Langra, Himsagar, Amrapalii and Mallika, Baramasi, Subarnarekha, Guava- Allahabadi Safeda, L-49, Sangam, Surkha. L-49, KG, Baruipur Selection; Lime- Vanarasi Kagzi, Papaya- Pusa Nanha, Pusa Dwarf; Banana- Basrai dwarf; Jack fruit- Dakh; Pomegarnate- Ganesh, Kandhar; Ornamental- Rose, Croton, Ashok *etc*. the statewise planting material production are provided in below table.

Table: Planting material production by the KVKs in Zone-II

Crops	Bihar			Jharkhand			West Bengal			A & N Islnads			Total		
	No.	Value (Rs)	No. of Farmers	No.	Value (Rs)	No. of Farmers	No.	Value (Rs)	No. of Farmers	No.	Value (Rs)	No. of Farmers	No.	Value (Rs)	No. of Farmers
Fruit	268251	7855777	5731	36486	861298.47	1232	79121	1879035	23790	840	600	0	383858	10596110	30753
Vegetables	478313	252359	3739	351977	1329362.8	1692	573919	421726	61736	6701	8430	36	1404209	2003447.8	67167
Medicinal & Aromatic	1001500	5504500	0	58040	140400	0	1241	2410	17	0	0	0	1060781	5647310	17
Forest sp	15335	103350	0	58	2790	14	96100	262900	693	0	0	0	111493	369040	707
Spices	25	100000	0	7092.5	74021.25	166	93448.2	105850	125	785	5775	0	100565.7	279871.25	291
Plantation Crop	0	0	0	42500	63750	0	2600	24000	117	0	0	0	45100	87750	117
Flowers	0	0	0	4500	4500	12	39800	39300	11501	0	0	0	44300	43800	11513
Ornamental	6760	49600	162	21960	28534.93	246	1097	6297	39	200	1000	0	29817	84431.93	447
Total	1770184	13865586	9632	522614	2504657	3362	887326	2741518	98018	8526	15805	36	3180124	19111761	111012

5.3 Bio-product

The KVKs of this zone are producing biofertilizers, biopesticides, bio-agents *etc*. in order to promote better soil health. Production of vermicompost and other biofertilizers in the year 2013-14 was 214732.0 kg and 361905.0 kg respectively. Production of bioagents like *Trichoderma etc*. was to the tune of 6280.2 kg. The KVKs also produced 756910 earth worms and distributed to the farmers of the zone.

Table: Production of bio product by the KVKs in Zone-II

		BIHAR			JHARKHAND			WEST BENGAL			ZONE-II		
Product Name	Name of the bio-product	Quantity (kg)	Value (Rs)	No. of Farmers	Quantity (kg)	Value (Rs)	No. of Farmers	Quantity (kg)	Value (Rs)	No. of Farmers	Quantity (kg)	Value (Rs)	No. of Farmers
Bio Fertilisers	Vermicompost	174900	1126000	786	31417	198102	699	8415.00	44220	168	214732	1368322	1653.00
	Bio Fertilisers	1750	600.00	0	360035	18000	175	120.00	1800	15	361905	20400	190
Bio Agents	Bio Agent	0.00	0.00	0	4033.4	68989	718	2246.80	112330	1623	6280.2	181319	2341
	Honey	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
	Vermi wash	0.00	0.00	0	15.00	450	8	0.00	0.00	0	15.00	450.00	8
	BGA	40.00	400.00	0	0.00	0.00	0	0.00	0.00	0	40.00	400.00	0
Earth-worm		304390	91305	10	452520	246245	1335	0.00	0.00	0	756910	337550	1345
Total		481080	1218305	796	848020.4	531786	2935	10781.80	158350	1806	1339882.2	1908441	5537

5.4 Livestock product

In a bid to diversify agriculture the KVKs of this zone are engaged in production of genetically superior offspring of livestock as well as quality fish seed. The KVKs produced 8345 cows; 57 calves; 9473 broilers; 3219 layers; 11415 dual purpose birds; 11552 ducks; 130 piglets; fish 113477 nos; 3960 fish fingerlings; 865000 spawn; 53559 ornamental fish seed. The KVKs in Zone II together earned revenue of Rs. 5611260 from sale of livestock and fisheries products.

Table: Livestock production by the KVKs.

	Bihar			Jharkhand			West Bengal			Total		
Particulars of Live stock	Number	Value (Rs)	No. of Farmers	Number	Value (Rs)	No. of Farmers	Number	Value (Rs)	No. of Farmers	Number	Value (Rs)	No. of Farmers
Cows	7	169000	0	56	0	0	8282	2966030	75	8345	3135030	75
Buffaloes	3	15000	1	0	0	0	0	0	0	3	15000	1
Calves	9	42500	0	33	4000	2	15	72000	6	57	118500	8
Goat	25	5200	0	20	72500	17	5236	457700	61	5281	535400	78
Broilers	5301	470836	435	3500	0	0	672	164225	69	9473	635061	504
Layers	565	4500	0	1500	0	0	1154	80640	210	3219	85140	210
Duals (broiler and layer)	174	27000	322	10062	0	0	1179	44764	92	11415	71764	414
Ducks	84	20000	0	8621	20000	10	2847	28131	357	11552	68131	367
Egg	0	0	0				2385	11925	89	2385	11925	89
Others	0	0	0				283	47200	114	283	47200	114
Pig	0	0	0	1	8635	1	3	19500	3	4	28135	4
Piglet	0	0	0	19	70345	9	111	216000	56	130	286345	65
Indian carp	6105	197700	128				53813	140784	487	59918	338484	615
Mix carp	0	0	0				0	0	0	0	0	0
Fingerling	0	0	0				3960	140650	36	3960	140650	36
Fish spwan	0	0	0				865000	21500	17	865000	21500	17
Others Ornamental fish, Carp fry, Exotic fish etc.	2000	1200	0				51559	71795	267	53559	72995.00	267.00
Total	14273	952936	886	23812	175480	39	996500	4482844	1939	1034585	5611260	2864

6.0 SOIL AND WATER SAMPLE ANALYSIS

The KVKs in the Zone II have tested 27476 samples which includes 26341 (95.8 %) soil samples and 1135 (4.2%) water samples. The opportunity of soil and water testing was availed by as many as 19778 farmers from 2107 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 and water samples tested and apply recommended doses of inputs.

In order to maintain the facilities farmers are charged a nominal amount for the services. The KVKs in the process have earned Rs 5, 03,480.00 as proceeds from soil and water testing charges.

Table: Soil and water testing by KVKs in different states

Sl. No.	Details	No. of Samples	No. of Farmers	No. of Villages	Amount realized
	A & N Islands				
1	Soil Samples	97	66	23	0
2	Water Samples	42	22	9	0
	Bihar				
1	Soil Samples	13102	7105	967	183520
2	Water Samples	551	527	40	150
	Total	13653	7632	1007	183670
	Jharkhand				
1	Soil Samples	8858	7769	506	232960
2	Water Samples				
	Total	8858	7769	506	232960
	West Bengal				
1	Soil Samples	4284	3755	387	73200
2	Water Samples	542	534	175	13650
	Total	4826	4289	562	86850
	Total				
1	Soil Samples	26341	18695	1883	489680
2	Water Samples	1135	1083	224	13800
	Total	27476	19778	2107	503480

7.0 SCIENTIFIC ADVISORY COMMITTEE

During the year under report as many as 76 KVKs out of 81 have conducted scientific advisory committee meetings and it was attended by 2425 participants/ stakeholders. It was ensured that all the nominated and members attend the meeting which is held primarily to develop annual action plan in a consultative mode. One representative each of male and female farmers too attended the meetings and enriched the discussion.

In a few cases public representatives like MLA/ Sarpanch/ Mukhia etc. too participated in the meetings. The zonal project director or a representative of the Directorate attended the meetings.

Table: State wise SAC meeting conducted by KVKs

Name of State	No. of SAC conducted	No. of participants
A&N Islands	3	99
Bihar	36	1252
Jharkhand	22	704
West Bengal	15	370
Total-	76	2425

Statewise data of conduct of SAC meetings revealed that in Bihar 36 out of 38 KVKs conducted SAC. While in Jharkhand all 22 KVKs conducted SAC. In West Bengal 15 out of 18 KVKs organized SAC and in Andaman & Nicober Islands all the 3 KVKs successfully organized SAC meetings.

8.0 PUBLICATION BY KVKS

The KVK scientists are engaged in research and extension activities. To highlight the activities of KVKs achievements they regularly publish research papers, technical reports, newsletters, popular article, pamphlets etc. The publications are circulated among different line departments, ATMA, SAUs and other agencies. During the last year 154 research papers, 70 symposium paper, 19 Books, 318 Bulletins, 23 Newsletter, 81 popular articles, 29 Book chapters, 312 Extension literals, 96 Technical reports and 82 Electronic publication (CD/DVD etc.) were

prepared and published. Altogether 1184 publication were brought out and 641498 nos. circulations were made.

Table : Publication in KVKs of Zone-II

Item	Bihar		Jharkhand		West Bengal		A & N Islands		Total	
	Number	Circulation	Number	Circulation	Number	Circulation	Number	Circulation	Number	Circulation
Research paper	100	59	13	1	38	733	3	0	154	793
Seminar/conference/ symposia papers	4	3	52	1002	14	11	0	0	70	1016
Books	4	2451	3	12000	10	1166	2	0	19	15617
Bulletins	10	11466	1	1	6	849	301	210	318	12526
News letter	20	29431	1	1200	2	450	0	0	23	31081
Popular Articles	71	28017	6	6705	4	1006			81	35728
Book Chapter	23	21002	0	0	3	1	3	0	29	21003
Extension Pamphlets/ literature	152	86185	56	60312	97	94484	7	0	312	240,981
Technical reports	51	214	5	35	40	33	0	0	96	282
Electronic Publication (CD/DVD etc)	15	680	1	10	29	28	37	35	82	753
Total	450	179508	138	81266	243	98761	353	245	1184	359780

9.0 CELEBRATION OF TECHNOLOGY WEEK BY KVKS

Showcasing agricultural and allied technologies in a presentable manner creates awareness as well as develops favourable attitude among farmers towards practice of such technologies. Farmers of far-off areas, unaware of the available modern technologies, get the opportunity to know and access the practices, get richer through sharing of experiences and become knowledgeable in taking part in scientist-farmer interaction. Technology week celebrated by almost all the KVKs of this zone in public-private partnership mode has been successful endeavour in all respect. Private and non-ICAR organizations like NABARD, Line departments, IFFCO, Mahindra, Seed Companies, NGOs and many more organizations spontaneously took part in exhibiting their products in front of large number of farmers, scientists and development officials, interacted with farmers, cleared their doubts and assured the availability of their products in time to the farmers through KVKs. All this farms as demonstration units with crop cafeteria, Technology Park and live action of various agricultural operations.

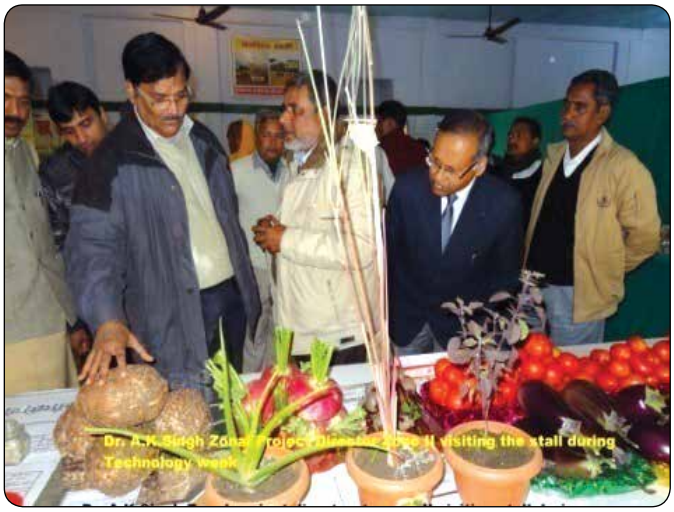
Exhibition organized to portray the products of the farmers at KVK premises was the most attractive feature of technology week. Presence of important personalities like Vice-Chancellor, Director and scientists of ICAR institutes, District Commissioner, Member of Parliament and State Legislative Assembly, Zilla Sabhadhipati and others as well as grading the products based on the size and quality of exhibits inspired the farmers to take their agriculture to another level. Similar enthusiasm was also observed during 'farmer-scientist interaction' and 'experience sharing among farmers' session. In some of the cases the sessions extended beyond stipulated hours to enable the farmers to

put forth their observations before experts. The platform of Technology Week also created conducive environment for the State Agricultural Universities and development departments. KVKs of nearby agricultural Universities accompanied the farmers to the Universities to expose them to the technology generation and technology transfer process. The development department, on the other hand, made the farmers aware of various ongoing schemes of state/central government, facilities could be availed by the farmers, rural youths and others etc.

The KVKs of Zone-II observed technology week with a view to popularize modern farm technologies among the stakeholders. It provided opportunity to the KVKs to showcase farm worthy technologies and at the same time educate various stakeholders about scientific farming. During the year 2013-14 as many as 68 KVKs observed technology weeks by organizing suitable programmes. In total 1144 activities were organized benefitting 129203 farmers and stakeholders. e KVKs organized exhibitions that drew as many as 32256 farmers while in demonstrations 30951 farmers participated. Other activities organized by the KVKs were film show, health camp, competition, innovative farmers' meet' quiz, group discussion, seminar, gosthies etc. KVKs promoted following technologies during technology week – hybrid rice production; green manuring; integrated farming system; farm mechanization; animal health management; scientific carp culture etc.

Table: Technology week celebration in different states

	Bihar (38)		Jharkhand (22)		West Bengal (18)		Total (82)		
Types of Activities	**No. of Activities**	**No. of Participants**	**No. of Activities**	**No. of Participants**	**No. of Activities**	**No. of Participants**	**No. of Activities**	**No. of Participants**	**Related crop/livestock technology**
Goshies	16	8792	56	3066	34	6329	106	18187	
Lectures Organized	22	376	20	125	28	1610	70	2111	Oilseeds, Maize, Spices, hybrid rice production, Green manuring for soil health, IPM in fruits, vegetables and paddy, Animal health & production for higher yields.
Exhibition	6	375	31	481	146	31,400	183	32256	Scientific farming practices
Flim Show	22	1565	38	698	16	351	76	2614	Modern techniques of crop production
Seminar	41	4584			30	7395	71	11979	Seminar on IFS; Farm Mechanization; Cereals & pulse production; Horticulture, Animal health
Health Camp	5	75			3	466	8	541	Animal and crop health
Inaugural Function					1	965	1	965	Visit to Exhibition, demonstration plot, Animal Show
Competetion					72	730	72	730	Crop, animal, handicraft & other competition
Panel discussion			1	300	4	282	5	582	
Innovative Farmers Meet					1	46	1	46	Discussion on Innovation
Ex-trainees Meet					1	180	1	180	Discussion on progress, problems faced & future plan
Krishi quiz					4	663	4	663	Quiz on latest farm technologies
Cultural programmes					17	6000	17	6000	Song ,dance, folk song one act play *etc*
Demonstration	62	8363	27	3756	58	18832	147	30951	Improved farming practices
Group discussion	18	754			4	100	22	854	
Others	205	13911	84	3598	71	3035	360	20544	Discussion on crop health management & Farmers-Service Provider/Sponsor/Scientist interactive meet
	397	38795	257	12024	490	78384	1144	129203	



10.0 TECHNOLOGICAL BACKSTOPPING BY DIRECTORATES OF EXTENSION

Flow of technology from State Agricultural Universities/ Research Institutes to the KVKs is pre-requisite to enable the KVKs to take up farmer's problems for providing appropriate solution. The Directorates in a sense operates between KVKs and farmers with responsibility to fulfill the need of the KVKs vis-à-vis farmers in terms of technological support. To streamline the free flow of information/technologies, 82 KVKs of this zone are put under the jurisdiction of five Directorates of Extension Education irrespective of host organizations of the KVKs. However, the other Directorates are also encouraged to provide technological support to the KVKs under its administrative control. An assessment of the performance of the Directorates of Extension Education during last one year indicates that the KVKs have been benefited from the Directorates in terms of obtaining seeds of major crops, planting materials, bio-products, livestock breed, livestock products, poultry breed, poultry products, livestock and poultry feed etc. In addition, the Directorates have also provided package of practices of various crops and vegetables, management and rearing practices of livestock and poultry, duckery, application procedure of bio-control agents, bio-products and others. Along with the technological products, the Directorates provided detailed information in the form of printed literature also.

As a part of assignment to oversee the activities of KVKs the Directors of Extension Education as well as officials from Directorates visited KVKs many a time in the programme/ occasion of SAC meeting, field day, technology week, training programme, interaction meeting, workshop/seminar organized at KVK, to accompany distinguished guests to KVKs and other important occasion. Altogether 154 such type of visit took place in the KVKs by the Directors/officials of Directorates in the last one year. Among the various

occasions, field visit was the most attended programme by all the DEEs followed by SAC meeting, inaugurating training programme, technology week, attending workshop/seminar and others. Among field visit, inspection to on-farm trial plot, frontline demonstration plot and discussion on specific problems with the farmers and other stakeholders were the most significant purpose. The DEEs visited 149 times to the field of farmers and recorded their observation/suggestions like better organization of field day, appropriate method of data collection, proper documentation of farmers' feedback, maintaining control plot in conducting FLD, adequate publicity towards organizing field days, making the farmers understand the design of OFT etc.

Conduct of regular HRD programmes for the KVK personnel by the Directorates has been another area of functioning of Directorates of Extension Education. All the Directorates organized a number of workshop-cum-training-cum-sensitization programme based on the need of the KVK personnel and/or make the newly recruited staff of KVK aware of principle, mandate, objective and functioning of KVKs. In last one year the Directorates conducted 39 different HRD programmes for 1017 KVK personnel. The major areas covered were high value crop management, application procedure of bio-pesticide in soil, internal/accounting control, role of KVKs in district towards agricultural development, ICT in educational technology, imparting management skill among KVK staff, recent advancement in veterinary science, recent development in agricultural engineering, gender mainstreaming of climate resilient agriculture, resource conservation technology suitable for Jharkhand, new frontiers in integrated crop management in rice based cropping system, innovative approaches to e-learning, farmers empowerment and entrepreneurship development in livestock sector, convergence in activities of KVKs and ATMA, value addition and processing of food from animal original, animal husbandry practices vis-à-vis rural health management and others.

Table: HRD activities organized by the Directorates of Extension Education

Sl. No.	Organized by	Title of the Programme	No. of programme	No. of participants	No. of KVKs
	Bihar Agricultural University, Bhagalpur				
1		Soil Testing & Nutrient Management	1	12	19
2		Internal/Accounting Control	1	23	19
3		Orientation Programme	1	22	19
4		Orientation Programme	1	19	19
5		Recent advances in Horticulture	1	18	19
6		Orientation Programme	1	18	19
7		Strategy & Planning for OFT	1	26	19
8		Plant Protection Measures for Major Crops	1	13	19
9		Finalization of Role of KVKs in district towards agricultural development.	1	31	19
10		Role of ICT in educational technology	1	20	19
11		ICT in educational technology,	1	20	19
12		Training for SMS of Eastern Region on Mango and Litchi Production.	1	30	19
13		Impart Management Skill amongst KVK, Personnel.	1	20	19
14		Recent advancement in Veterinary Science.	1	15	19
15		Recent development in Agriculture Engineering	1	20	19
16		Traning Programme for SMS, Home Science	1	20	19
		Total	16	327	304
	Birsa Agricultural University, Ranchi				
17		Gender Mainstreaming for Climate Resilient Agriculture.	1	19	18
18		Resource Conservation Technologies suitable for Jharkhand.	1	15	18
19		New Frontiers in Integrated Crop Management in Rice-based Cropping System	1	12	18
20		Conservation Agriculture in context of Jharkhand	1	16	18

Sl. No.	Organized by	Title of the Programme	No. of programme	No. of participants	No. of KVKs
21		Innovative Approaches to e-Learning	1	15	18
22		Farmers Empowerment and Entrepreneurship Development in Livestock farming	1	15	18
23		Pest Management in high valued crops	1	15	18
		Total	7	107	126
	Bidhan Chandra Krishi Viswa Vidyalaya, Mohanpur				
24		Nursery management for rural youths	1	17	3
25		High value crop management	1	25	3
26		Seedling production and management	1	20	3
27		Methyl euzinol trap preparation	1	20	3
28		Application procedure of bio-pesticide in soil	1	20	3
29		Application procedure of *tricodermaviride* in soil	1	19	3
30		Friends of coconut tree	1	120	3
31		Nursery management for rural youths	1	17	3
32		High value crop management	1	25	3
33		Seedling production and management	1	20	3
			10	303	30
	West Bengal University of Animal and Fishery Sciences, Kolkata				
34		Financial management in KVK activities	1	30	3
35		Convergence in activities of KVKs and ATMA	1	42	3
36		Value addition and processing of food from animal origin	1	30	3
37		Animal husbandry practices vis-à-vis rural health management	1	35	3
39		Workshop on Role of skilled manpower in agricultural field for inclusive rural development	1	103	3
			5	240	15
Total -			38	977	475

10.1 PUBLIC-PRIVATE PARTNERSHIP (PPP) – BAU, Bhagalpur

PPP broadly refers to long- term, contractual partnerships between public and private sector agencies, specially targeted towards financing, designing, implementing, and operating infrastructure facilities services that were traditionally provided by the public sector. In a PPP, each partner, usually through legally binding contract(s) or some other mechanism, agrees to share responsibilities related to implementation and/or operation and management of a project. This collaboration or partnership is built on the expertise of each partner that meets clearly defined public needs through appropriate allocation of Resources, Risks, Rewards, Responsibilities The allocations of these elements and other aspects of PPP projects such as, details of implementation, termination, obligations, dispute resolution and payment arrangements are negotiated between the parties involved and are documented in written contract agreement(s) signed by them. As per the Scheme for Financial Support to Public Private Partners hips in Infrastructure, of the Government of India, "The Public-Private Partnership (PPP) Project means a project based on contract or concession agreement between a Government or statutory entity on the one side and a private sector company on the other side, for delivering an infrastructure service on payment of user charges."

The Directorate of Extension Education has entered in PPP mode for better delivery of various services which is mentioned below:

1. Care India Solutions for Sustainable Development, Patna: BAU, Sabour is associated with Care India Solutions for Sustainable Development, Patna to broadcast the SWASTH radio contents in the existing community radio centre at Badh, Patna. The association would help in the preparation of radio contents/slots/ episodes and dissemination

through community radio simultaneously. Also, the dissemination of best practices would also be showcased through it.

2. M/S CLASS India Private Limited, Faridabad: A memorandum of understanding was signed by the university with M/S CLASS India Private Limited, Faridabad for facilitating training programmes. The objective is to engage BAU for training and development through dissemination of technical knowledge. The collaboration would mutually benefit both the organizations.

3. ITC Limited, Kolkata: The collaboration was completed to foster sustainable livelihoods among farmers of Munger district in Bihar through improved agricultural practices, livestock development, dairy development and non-farm based livelihood pragrammes using the infrastructure, skill and expertise of BAU. The university is responsible for providing technical support for the purpose of demonstration of the sustainable livelihood practices and training of the farmers in the said practice while ITC will implement the programme through any agency (private/government). Agency shall be responsible in assisting the farmers in implementing the sustainable livelihood practices which would be demonstrated to the farmers during the training.

10.2 Training to Kisan Salahkar at BAU, Bhagalpur

The Bihar government has appointed one Krishi Salahkar (agriculture adviser) in each of the state's 8,463 panchayats to provide agricultural extension services.

The Kisan Salahkars are trained by Krishi Vigyan Kendras on various agricultural topics related to horticulture, floriculture, field crops, food processing etc. The report of Kisan Salahkar trained by the KVKs is mentioned in the table given below:

Table: Kisan Salahkar trained by the KVKs

KVK	Male	Female	Total
ARARIA	86	4	90
ARWAL	56	2	58
AURANGABAD	82	8	90
BANKA	25	5	30
BHAGALPUR	77	13	90
GAYA	51	9	60
JEHANABAD	51	9	60
KATIHAR	80	10	90
KHAGARIA	23	7	30
KISHANGANJ	28	2	30
LAKHISARAI	30	0	30
MADHEPURA	80	10	90
MUNGER	58	10	68
NALANDA	30	0	30
PATNA	81	9	90
PURNEA	88	2	90
ROHTAS	87	3	90
SAHARSA	29	0	29
SHEIKHPURA	30	0	30
SUPAUL	56	4	60
TOTAL	1128	107	1235

11.0 AGRICULTURAL TECHNOLOGY INFORMATION CENTRE

Agricultural Technology Information Centre (ATIC) as a 'single window' delivery mechanism is operating in the Union Territory of Andaman & Nicobar Islands under Central Islands Agricultural Research Institute, Port Blair and in the states of Bihar, Jharkhand and West Bengal under Bihar Agricultural University and Bidhan Chandra Krishi Viswavidyalaya. The facilities developed in the ATICs include reception counter, exhibition/technology museum, touch screen kiosk, cafeteria, sales counter, register to collect farmers' feedback, video conferencing facility and a farmers' library, Farmers from various districts are the regular visitors to ATIC is search of technology information, technology products and other purposes. In 2013-14, the ATICs were visited by 52510 farmers out of which 18458 for collecting technology information, 4260 for technology products, 25000 to participate in kisan mela and rest 4792 for other purposes.

In respect of technology information, 1071 number of farmers enquired about varieties/crop hybrids, pest management, disease management, various agro-techniques, soil and water conservation, post harvest technology and value addition, animal husbandry and fishery. The farmers availed the facility of Kisan Call Centre apart from public/personal telephone. The farmers (157 numbers) also communicated through letters besides collecting information through personal visit by 1057 farmers. In obtaining information, 20 farmers sent e-mail to ATIC managers. Based on the request received from the farmers, training programmes for farmers/technocrats/students were organized at ATIC for 2205 participants. In the area of post harvest management and value addition, 262 persons took part in the training porgrammes followed by agro-technique (117 persons), disease management (103 persons), soil and water conservation (72 persons), varieties/hybrids (59 persons) and animal husbandry and fishery (57 persons).

Information to the farmers and other stakeholders was also provided through priced and free of cost publication from the ATICs. This has helped the ATICs to generate revenue also to the extent of Rs.4.75 lakh, through selling of 32524 number of books for the benefit of 30624 farmers. The other print and electronic materials provided to 27196 farmers were technical bulletins, leaflets, magazine, research journals, bulletins, CDs and Video films.

With regard for technology products provided by the ATICs of Zone-II, seeds, planting materials, livestock breed, poultry birds, bio-products, arecanut, scented rice, mustard oil and capsicum were made available to 5914 numbers of farmers. The ATICs could earn a substantial amount of Rs.4.29 crore through this sale procedure. Out of all the technology products, planting materials fetched Rs.2.88 crore followed by seeds (1.06 crore), livestock (21.48 lakh), poultry birds (10.33 lakh), mustard oil (1.41 lakh), scented rice (0.40 lakh), capsicum (0.14 lakh) and others.

The ATICs also provided technology services to the farmers like soil and water testing, diagnosis of plant diseases, making information available about services available with line departments and various campaigning (kharif/rabi) programmes launched by state governments. Thourgh such services, 532238 farmers could get their soil and water sample tested through ATICs, 3177 farmers got their plant samples diagnosed and 30000 farmers could know about various development programmes and special campaign of state governments to get the benefit from such programmes.

12.0 HRD ACTIVITIES

Zonal Project Directorate Zone-II organized number of Workshop-cum-training programmes for KVK staffs . It was organized by Zonal Project Directorate and in collaboration with Directorate of Extension Education of SAUs . Different agencies like PPV & FR, IGFRI were also associated with the human resource development of the KVK staffs. A total of 16 programmes were organized involving 721 participants involving 385KVKs.

Table: Workshop-cum-training programme and meetings organized by ZPD, Zone-II

Sl. No.	Organized at	Title of the Programme	No. of programme	No. of participants	No. of KVKs
1.	ZPD, Zone-II, Kolkata	Zonal Farm Innovators meet	1	103	42
2.	ZPD, Zone-II, Kolkata	Zonal Workshop of KVKs of Zone-II	1	148	80
3.	ZPD, Zone-II, Kolkata	Brainstorming session on Improving Research in Agricultural Extension	1	36	22
5.	ZPD, Zone-II, Kolkata	Review meeting of DEEs, PCs of KVKs of Zone-II	1	17	4
6.	ZPD, Zone-II, Kolkata	Workshop on Animal Disease monitoring and surveillance (Collaboration with PD ADAMAS, IVRI-ER)	1	15	11
7.	ZPD, Zone-II, Kolkata	Review Workshop-cum-training programme on KVKs (West Bengal & A&N Islands)	1	37	17
8.	ZPD, Zone-II, Kolkata	Review workshop of KVKs of Jharkhand	1	30	22
9.	ICAR RC-ER, Patna	Review workshop of KVKs of Bihar	1	44	37
10.	CHRD, Kalyani	Sensitization workshop on protection of plant varieties and farmers' report	1	100	47
11.	ZPD, Zone-II, Kolkata	Workshop-cum-training programme on NIFTD for KVKs of Zone-II	1	25	16
12.	ZPD, Zone-II, Kolkata	Meeting of DEES and Zonal Project Director, Zone-II	1	22	–
13	ZPD, Zone-II, Kolkata	State level workshop-cum-training for the KVKs of West Bengal & A&N Islands	1	44	17
14	ZPD, Zone-II, Kolkata	Zonal Level Review- cum- Workshop of NICRA - KVKs	1	20	15
15	ZPD, Zone-II, Kolkata	Workshop on Technological Backstopping to DEES of SAUs of the Zone	1	20	10
16	ZPD, Zone-II, Kolkata	Consultation meet -cum-Workshop contingency planning for deficit rainfall in the districts of Bihar and Jharkhand	1	35	30
17	ZPD, Zone-II, Kolkata	HRD on Value addition and processing of food from animal origin	1	25	15
		Total -	16	721	385

13.0 REVENUE GENERATION

KVKs of Zone-II attracted funds from a number of organizations through sanction of projects from State Department of Agriculture, Central Government, RKVY, NABARD, ATMA, NGOs, MNREGAS, DRDA, Zilla Parishad etc. Those projects help to organize extra training, research projects, building infrastructural facilities in the KVK. It helps to earn substantial amount of revenue which supported and strengthen the activities of the KVK. During the year 2013-14 KVKs of Zone-II generated Rs. 109391050 through the projects. In Bihar Rs. 17234022 has been generated through projects. Kisanganj KVK attracted Rs. 4300000, Jamui Rs. 225000, Sitamarhi Rs. 1732361 and Nawada KVK attracted Rs. 1098000 during the year. In Jharkhand an amount of Rs. 39787747 has been generated. KVK Deoghar generated Rs. 23954150 following Latehar Rs. 2550000, Ranchi Rs. 3999420. In West Bengal Rs. 52369281 has been generated. KVK South 24 Parganas generated Rs. 27288270, Dakshin Dinajpur Rs. 3024306. The amount generated indicated success of the KVK in attracting the fund from outside sources.

14.0 KISAN MOBILE ADVISORY SERVICE

The Directorate is popularizing the use of various ICT tools for maximizing the reach of extension. Through Kisan Mobile Advisory Services (KMAS) registered farmers are supplied with need based advises in the form of SMS. Delivery of SMS to the farmers is being coordinated by the Directorate through a service provider, outsourced for the purpose. During the year 2013-14, KVKs sent as many as 1651912 messages that benefitted 334304 farmers. The KVKs of the zone also received 95161 calls/telephonic queries from the farmers and this is increasing rapidly over the years. Number of SMSs sent for thematic areas were 27128, 17122, 2271, 1539, 7952 and 5620 for crops, livestock, weather, marketing, awarenesss and others respectively.

Table: KMAS service provided by the KVKs in Zone II

States	No. of calls	No. of farmers covered	No. of messages	Types of messages (No.)					
				Crop	Livestock	Weather	Marketing	Awareness	Other
Bihar	63620	191226	1584707	12488	2402	1210	1059	1984	170
Jharkhand	596	57898	5429	2532	686	247	37	670	1206
West Bengal	30945	85180	61776	12108	14034	814	443	5298	4244
Total	95161	334304	1651912	27128	17122	2271	1539	7952	5620

14.1 National farmers portal

Department of Agriculture and Cooperation, Government of India has embarked upon a massive ICT initiative called National farmers portal – a One stop shop for farmers. The portal can be accessed at ww.farmer.gov.in. The Directorate is providing hand holding support to the KVKs to get registered and helping them upload messages to be sent through the portal.

Fig. Screen shot of registration page

Fig. Dashboard of SMSs sent

During the year 2013-14 a total of 57245 messages were sent to 713406 farmers. The details of which could be viewed through dash board of the portal.

Table: SMS sent through farmers portal

States	No. of messages	No. of calls	No. of farmers covered	Types of messages (No.)					
				Crop	Livestock	Weather	Marketing	Awareness	Other
Bihar	31980	2326	539189	2125	55	20	1	79	165
Jharkhand	380	334810	46611	4489	1558	1016	100	3098	87
West Bengal	24885	221	127606	11794	7143	3546	908	3687	205
Total	57245	337357	713406	18408	8756	4582	1009	6864	457

15.0 TRIBAL SUB PLAN (TSP)

During the year 2013-14 the zone received funds to the tune of Rs 55.00 lakhs earmarked under Tribal Sub Plan. The fund was allocated to 12 KVKs following the guidelines issued by the Council. Schemes that ensure direct benefit to the individual or families belonging to Scheduled Tribes and outlay for area oriented schemes directly benefitting scheduled tribe hamlets/villages having more than 40 % scheduled tribe population were included. Schemes for developing agriculture and allied activities like irrigation, animal husbandry, dairy development, vocational training etc. were taken up.

During the year under report the KVKs conducted on farm testing on 46 technologies and conducted 651 front demonstrations. In various extension activities a total of 14985 tribal farmers took part and 2939 tribal farmers were trained in scientific farming practices. The KVKs produced 11.04 tonnes of improved variety seed; 51245 planting materials and over 50000 fingerlings. The KVKs disseminated 114 farm related SMSs benefitting 23138 tribal farmers.

Table: TSP achievement during 2013-14

	Pakur	Giridih	Palamau	Saraileka	Gumla	Dumka	Sahibganj	Total
OFT	0	32			33	5	58	118
FLD	13		7	1	323	23	284	651
Farmers trained (in lakh)	0.00048		0.0002	0.0003	0.02731	0.0011	-	0.02939
Ext. per. trained (in lakh)	0.0007	0.00262			0.00563	0.00026	0.0021	0.01131
Parti. in ext. (in lakh)	0		0.0002		0.14845	0.0012		0.14985
Production of seed (in tonnes)	0.00036				11.047			11.04736
Planting material produced (in lakh)	0				0.51245			0.51245
Livestock strains and finger lings produced (in lakh)	0				5 no. and 0.50			0
Soil, Water, Plant, manures samples tested (in lakh)	0				0.00475	0.00023		0.00498
Mobile agro-adv. (No. of messages)	0				99	15		114
Mobile agro adv.(farmers)		215	40		22562	321		23138

16.0 PROTECTION OF PLANT VARIETIES & FARMERS' RIGHT (PPV&FR)

In view of providing the way for establishment of an effective system for the protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new varieties of plants, Govt. of India enacted 'The Protection of Plant Varieties and Farmers' Right (PPPV&FR) Act, 2001' to recognize an to protect the rights of the farmers in conserving, improving and making plant genetic resources for the development of new plant varieties. Indian legislation is not only in conformity with the International Union for the Protection of New Varieties of Plants (UPOV), 1978, but also have sufficient provisions to protect the interests of public/private sector breeding institutions and the farmers. The legislation recognize the contributions of both commercial plant breeders and farmers in plant breeding activity and also provides to implement TRIPs in a way that supports the specific socio-economic interests of all the stakeholders including private, public sectors and research institutions, as well as resource constrained farmers.

To implement the provisions of the Act, the Department of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India established Protection of Plant Varieties & Farmers' Rights Authority (PPV&FRA) on 11th November, 2005. The PPV&FRA in turn, took up large-scale awareness-cum-training programmes for the farmers through State Agricultural Universities, ICAR Institutes and other research and development organizations. In extending helping hands to PPV&FRA, Zonal Project Directorate, Zone-II provided its support to involve the existing network of KVKs to enable the PPV&FRA to achieve its set objectives of establishing an effective system for the protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new varieties of plants; recognizing and protecting the rights of the farmers in respect in respect of their contributions made in any time in conserving, improving and making available plant genetic resources for the development of new plant varieties; accelerating agricultural development in the country, protect plant breeders' rights, stimulate investment for research and development of new plant varieties and facilitating the growth of seed industry in the country, which will ensure the availability of high quality seeds and planting materials to the farmers.

As a collaborative approach, Zonal Project Directorate identified 24 KVKs from the state of Bihar, Jharkhand, West Bengal and Union Territory of A&N Islands for crating awareness among the farmers of the concerned districts. The districts were selected based on the availability of food number of near-extinct plant varieties and combination of farmers towards development of new plant varieties, which can be patented. To give the programme a concrete shape as well as to evolve an effective plan of action, a sensitization workshop-cum-training programme was organized in this zone on 17th December, 2013 in the presence of all identified KVKs, Plant breeders of research institutes/SAUs, farmers and scientists of Zonal Project Directorate. In the day-long workshop the representatives of PPV&FRA deliberated on various rights under the Act like Breeder' Rights, Reserchers' Right and Farmers' Rights besides access to seed, benefit sharing, compensation, reasonable seed price, farmers' recognition and reward for contributing to conservation for the commercialization of essentially derived varieties, exemption from registration fees for farmers and farmer protection from innocent infringement. The workshop also dealt in detail about the procedure for registration of new varieties, national registers, of plant varieties, national gene bank, national gene fund, benefit sharing, rights of community and all other related issues.

Provision made in the laws and by laws to encourage the farmers as well as breeders through reward and patenting was also covered. Four more KVKs from this zone were inducted for this programme to take up awareness campaigning activity in 24 KVK districts of Zone-II. With the financial and technical support from PPV&FRA and close supervision and monitoring by Zonal Project Directorate, all the 24 KVKs successfully conducted awareness programme on PPV&FR followed by identification of good number of plant materials for its registration with PPV&FR Authority.

Prior to formal implementation of this joint venture, three farmers of this zone contributed towards conservation of plant varieties have been awarded with Plant Genome Saviour Farmer Award, 2011-12 and Plant Genome Saviour Farmer Recognition, 2012. The details are given below:

Plant Genome Saviour Farmer Award, 2011-12
(Rs. 1 lakh, Citation and Memento)

Shri Pravat Ranjan Dey, Panpare, Nadia, West Bengal for conservation of sweet, scented mango variety Sujata and sharing its planting materials among 60 farmers and doing laudable work for conservation of scented mango variety and spreading awareness among farmers about agro-biodiversity and conservation.

Ushagarm Trust, Nadia, West Bengal for conservation of 11 varieties of Rice viz. Radhatilak, Gobindabhog, Megi and other 52 medicinal plants and doing commendable work for conservation of rice and medicinal plants and spreading awareness among farmers about agro-biodiversity and conservation of landraces and farmers' varieties.

Plant Genome Saviour Farmer Recognition, 2012
(Citation and Memento)

Shri Sumanta Misra, Jalpaiguri, West Bengal for conservation and development of chilli (Golden pasha and Akashu), pointed gourd (Parwal), cotton, pulses, lime (kagzi) and guava and doing commendable work of conservation of above mentioned crops and spreading awareness among farmers about agro-biodiversity and conservation of landraces and farmers' varieties.

The list of crops identified for registration is given below:

Table: Details of crops identified for registration

Sl. No.	Name of crop	Number	Sl. No.	Name of crop	Number
1	Paddy	424	17	Pearl millet	7
2	Wheat	10	18	Toria	1
3	Maize	39	19	Cowpea	8
4	Mustard	29	20	Oat	5
5	Linseed	14	21	Sorghum	2
6	Chick pea	9	22	Brinjal	22
7	Lentil	7	23	Other vegetables	21
8	Green gram	8	24	Turmeric	14
9	Black gram	23	25	Garlic	4
10	Sesame	4	26	Ginger	3
11	Ground nut	4	27	Medicinal plants	2
12	Green gram	26	28	Potato	7
13	Red gram	4	29	Jute	2
14	Niger	4	30	Cotton	1
15	Horse gram	11	31	Mango	1
16	Sesame	2	32	Other crops	76
				Total	798

17.0 NATIONAL INITIATIVE ON FODDER TECHNOLOGY DEMONSTRATION (NIFTD)

In India, agriculture and livestock are inseparable parts of rural livelihood. Rearing livestock not only engages a significant rural population but also ensures sizeable income for them. Moreover, it acts as insurance for the farmers in the event of sub-normal/scarcity years when crop production witnesses drastic reduction both in areas and productivity. A close look at the livestock population indicates that India accounts for 15% of the total world livestock population which is dependent on 2% of geographical area. At present, India is facing a net deficit of 35.6% in green fodder, 10.95% in dry crop residue and 44% in concentrate feed ingredients. The demand for green fodder and dry forage is expected to reach to 1012 and 631 million tons, respectively, by the year 2050. Hence, to meet the current level of livestock production and its annual growth in population, well thought strategies are needed to meet this demand either by increasing productivity, utilizing untapped feed resources or increasing land area. However, expansion of land area under fodder cultivation may not be a viable option owing to human pressure for bringing more areas under food crops.

In India, there is regional and seasonal disparity in fodder production and availability. Lack of sufficient post harvest and storage facility often prevents proper utilization of surplus fodder. Diversion of fodder from surplus to deficit areas is also not a common practice. Diversion of edible crop residues to non-agricultural use is also a matter of concern towards making crop residues stable feed of livestock. In our country, out of 55 micro regions, 43 are deficient in fodder availability. In spite of the importance and contribution of forage production in livestock sector, systematic efforts have hardly been made to strengthen the area of fodder and forage production. There is considerable lack of awareness about fodder production, utilization and marketing among the farmers as well as extension workers. The allocation of fund for fodder development is also very less against the total fund allocation for the animal husbandry sector. Linkage among various organizations related to fodder is also missing in some way or the other. A holistic view point is needed to bring the entire process of fodder and forage production under a well organized production and utilization system. Keeping in view the need to increase production as well as to reduce the demand supply gap, a flagship programme has been conceptualized by Indian Council of Agricultural Research across the country with the following objectives.

i. Accelerating production of fodder through promotion of comprehensive fodder production, conservation and utilization in mission mode for enhancing the availability of fodder throughout the year.

ii. Developing seed and planting material bank of forages for catering the requirements of their vicinity.

iii. Establishing backward and forward linkages with different stake holders for profitable forage based livestock husbandry.

iv. Promotion of opportunities in commercial venture of fodder production and utilization.

Considering the importance of enhancing fodder production, initially 100 KVKs from all 8 zones were selected to take up seed production and fodder demonstration programme in 100 KVK districts. In the process IGFRI, Jhansi was assigned the responsibility to provide technology module, basic seed and planting materials and capacity building of KVK staff to make them knowledgeable and skillful in carrying out the programme on Mission Mode. To give the programme a workable platform, 90 KVKs across the nation were finally trained at IGFRI, Jhansi, MPKV, Rahuri and Farmers' Training Centre, BCKV, Kalyani, Nadia. Technology module for all the 90 KVKs was developed.

18.0 NATIONAL INITIATIVE ON CLIMATE RESILIENT AGRICULTURE

Performance appraisal of selected 15 KVKs involved in carrying out the project entitled, 'National Initiative on Climate Resilient Agriculture (NICRA)' in the climatically vulnerable districts of Zone-II is indicative of the trend of change from subsistence to better agriculture. Interventions executed in agriculture, animal husbandry, fishery, resource conservation and other identified areas are proving its worth for the betterment of farming community of the project area.

Natural Resource Management

The storage level in tanks and reservoirs gradually reduced or dried in the hilly region of Andaman and Nicobar islands during the dry period. Tank cum well system of irrigation was created as best options for the farmers of the islands as the tanks are situated in higher slopes and well is located in downhill within the recharge zone of the tank on the valley areas. The harvested seepage water from the tank is stored in the well and pumped out and irrigated the vegetable crops in NICRA village of Port Blair during dry spells.

Two existing *Aahar i.e.* water reservoir of 1506 ft were renovated at NICRA village of Nawada and made provision for supplementary irrigation in 15 ha area during dry kharif season.

Five water reservoirs were constructed in NICRA village of Aurangabad and excess rain water harvested in those ponds have been used for irrigation of rabi crops and life saving irrigation of kharif crops. Renovation of 10 number of old drainage channels was done in public participatory mode in Gunia village of Gumla. The channels consist of 12 inlet of pond and 10 outlet of pond which were used to collect excess runoff rain water and to manage surplus water, respectively, consequently irrigated the area of more than 50 ha area during dry rabi and kharif seasons. An excavated canal (4 km long) harvested 3600 acre-inch rainwater during the monsoon which irrigated 100 acres of land under sunflower and 100 acres of vegetable field during rabi for the benefit of 560 farmers.

Renovation of five numbers of ponds in NICRA village of KVK Coochbehar had increased depth of water from 5.5-7.0 ft to 10.5 -11 ft with enhanced water storage capacity of 3X32X929 cu. ft. Harvested water provided that irrigation to rabi crops. In situ moisture conservation by using paddy straw as organic mulch-material in tomato which could save 11.76 ha-cm irrigation water and increase 31% water use efficiency. Raised bed and furrow irrigation in Brinjal and cucumber in 10.5 ha area increase the water use efficiency 30% . An existing drainage channel of 550 ft long has been renovated to drain out stagnant seepage water from field of 15 ha to bring back crop cultivation in a large area at NICRA village of KVK Supaul. Paddy has been transplanted in low-lying areas also.

Crop Production

Short duration varieties i.e. *PDM 84-139* of moong for lowland rice fallow situation; *KBSH-44* for sunflower for slightly saline conditions in the field after recession of brackish water and *SreeVardhini* of sweet potato in slightly saline conditions in the field after recession of brackish water were found suitable in NICRA adopted village of S 24 Parganas. Community nursery for raising vegetable seedlings of cauliflower (var. Pusa hybrid 1), tomato (var. Kashivisesh) and brinjal (Pusa hybrid 9) was introduced in the NICRA adopted village of Jehanabad to infuse the sense of mutual cooperation and to bring vegetable growers together for better bargaining of their produce. A common place/field was identified for raising vegetable seedlings in a staggered manner to advance/delay the date of transplanting in coping up with climatic aberration.


KVK Aurangabad demonstrated intercropping with cucumber and beans (Bodi) for the purpose of water conservation at NICRA adopted village Harigaon. This intervention reduced approximately 21% irrigation cost.

Low water requiring crops namely Urd (var. Utra) and Sesamum (var. TKG-22) had been introduced in NICRA adopted village as an alternate to paddy in drought situation of kharif season. An area of 2.5 ha was brought under the crops in NICRA village. KVK Port Blair identified a shrub, *Vitex trifolia*, commonly known as *Samulu* for its use as live fencing of field crops against cyclonic weather, caterpillar and worm repellant in paddy. It could be used to minimize the attack of caseworm and ear cutting caterpillar and as a natural remedy against other pests and diseases of paddy. The dry leaves were used to prevent the attack of stored grain pests in paddy and pulses with very good effect. The shrub was being propagated through cuttings for its planting in non-NICRA villages too.

Livestock & Fisheries

Pashu chocolate, commonly known as urea-molasses-mineral block (UMMB) had been introduced in NICRA adopted village Chopnadih at Koderma to ensure the uptake of minerals and vitamins by the ruminants. The chocolate was prepared in a cemented block consisting molasses, rice bran, urea, salt, di-calcium phosphate, trace minerals and water at a given ratio and kept in a convenient place for the cows to lick it. Regular licking by cows ensured early conception, minimum repeat breeding and shortened calving interval. Nutritive value was also higher compared to conventional feed which helped in increasing milk yield as well as quality by enhancing fat content of milk. T&Dbreed of pig introduced in NICRA village improved productivity as well as tolerance to prevalent diseases reared under semi-intensive condition. Locally available housing materials were utilized to construct the sty at a lowered cost.

Incidence of parasitic infestation in relation to climate change was studied in convergence with PDADMS, Hebbal in all the KVKs of West Bengal. Collected samples was diagnosed in relation to epidemiological studies of parasitological infestations in animals in relation to climate change in collaboration with the Project Directorate of Animal Disease Monitoring and Surveillance, Hebbal, Bangalore.

Institutional intervention and capacity building

Community afforestation with mangroves in coastal villages of S 24 Parganas prone to inundation with brackish water during frequent cyclonic storms breaching the river embankment was made. The mangrove plantation could protect as buffer against storm and cyclone.




Weather-based advisory provided to farmers of NICRA adopted villages and regular interaction among KVK functionaries, VCRMC members, ATMA officials and line department personnel at NICRA village minimized the attack of climbing cutworm and other insect-pests in paddy. Climate based advisory services provided to the farmers of NICRA village on weekly basis was effectively monitored by VCRMC for their adherence by the farmers.

Village Climate Risk Management Committee (VCRMC)

Village Climate Risk Management Committee (VCRMC) was constituted after in-depth discussion with the villages about the mitigation of and adaptation to the climatic vulnerabilities of the villages adopted under NICRA. The members of the committee were selected by the villagers under the facilitation of KVKs where NICRA was being implemented. VCRMC became operational with opening of a bank account in their name being jointly handled by the President of VCRMC and the Programme Coordinator of the KVK concerned. The custom hiring of various farm tools and implements was being supervised by VCRMC apart from taking important decisions on the technological interventions to be implemented at the village in consultation with the KVK.

Jay Prakash Village Climate Risk Management Committee, constituted under NICRA being implemented at KVK Nawada, Bihar generated the highest amount of Rs. 1,19,944 in the bank account of VCRMC in Zone-II. The VCRMC created awareness among the farmers by frequent group meetings, trainings and exposure visits to collect every drop of water in the village. The VCRMC also decided for efficient utilization of the water harvested through renovated structures as a follow-up measure. For this purpose, the low water requiring crops like pigeon pea and urd were cultivated as alternate crops to paddy (high water requiring crop) in drought situation of kharif season. In the process of renovation of old pyne (water course in the village) for

improving the irrigation facility, a total of 2772 ft long renovated pyne increased irrigation to an additional 25% of total cultivable area. Growing vegetables has been possible with the created irrigation facility. Similarly, the creation and renovation of water harvesting structures resulted in larger (1700 ft) embankment areas which were brought under plantation of 1100 trees (forest and fruit) like sisum, mehgoni, simul, jackfruit, ber, jamun, mango etc.

Custom Hiring of Farm Implements and Machinery at NICRA Adopted villages

Custom hiring initiated in the NICRA adopted village under the supervision of VCRMC has become immensely popular among the farmers and substantial amount has also been generated. Farm tools and implements, which were beyond the reach of resource-poor farmers due to non-availability and cost factor, became available at an affordable price through custom hiring.

Table: VCRMC Bank Account status of NICRA KVKs of Zone II

Sl. No.	Name of KVK	Amount (Rs)
1	S 24 Parganas	1,09,784
2	Coochbehar	40,472
3	Malda	19,036
4	Port Blair	11,855
5	Aurangabad	34,500
6	Jehanabad	36,116
7	Saran	70,000
8	Supaul	24,254
9	Buxar	18,961
10	Nawada	1,19,944
11	Gumla	38,693
12	Chatra	15,206
13	East Singbhum	8,000
14	Palamu	5,000
15	Koderma	7,800

19.0 INTERNATIONAL PLANT NUTRITION INSTITUTE (IPNI)

Collaborative short term research activities

Validation Trials for Nutrient Expert® Decision Support Tools for Maize and Wheat supported by IPNI

Nutrient Expert® Decision Support Tools, developed by The International Plant Nutrition Institute (IPNI), is an easy-to-use, interactive and computer-based decision support tools that can rapidly provide nutrient recommendations for individual farmers' field in the presence or absence of soil testing data. This tool for a specific crop and geography (Site-Specific Nutrient Management; SSNM) was developed through a series of dialogues and consultations involving target users and local stakeholders from both public and private sectors. The decision support tools have been validated for three consecutive years across large number of locations, in collaboration with Indian Council of Agricultural Research (ICAR), State Agricultural Universities (SAUs), State Agricultural Developments etc.

The Nutrient Expert® Decision Support Tools are now ready for extension through different stakeholder bodies like the Krishi Vigyan Kendras (KVKs). Towards this endeavour, a total of 24 KVKs across three states of this zone (list enclosed in Table) have conducted the NE® trial funded by IPNI. The common experimental design for all implementing KVKs was:- (i) Group-I: Farmer's practice; (ii) Group-II: Recommended dose of fertilizers; and (iii) Group-III: Fertilizer doses as per the NE® tools developed by IPNI. The trials were conducted on wheat pre-dominantly (by 22 KVKs), though few trials were also carried out on maize (2 KVKs) during last Rabi season.

The number of locations for the trial was restricted to 5 per treatment. The trial sites were being regularly visited jointly by the IPNI and ZPD personnel for effective supervision of the trial plots. The data on various yield and soil health parameters are being collected for their further analysis in order of validation of the NE* for wheat/maize to be recommended for this zone. However, some preliminary data have been presented in the following Table.

Table: List of KVKs where IPNI trial on wheat/ maize was conducted

Sl. No.	Name of the State	Name of KVK	Sl. No.	Name of the State	Name of KVK
	West Bengal			**Jharkhand**	
1.		Jalpaiguri	13.		Gumla
2.		Coochbehar	14.		Lohardaga
3.		Murshidabad	15.		Bokaro
	Bihar		16.		Dhanbad
4.		Bhagalpur	17.		Giridih
5.		Aurangabad	18.		Dumka
6.		Jamui	19.		Saraikela
7.		Nawada	20.		Pakur
8.		Bhojpur	21.		Sahibganj
9.		Buxar	22.		Hazaribag
10.		Kaimur	23.		Koderma
11.		Sitamarhi	24.		Godda
12.		Madhepura		**Total**:	24

Table: Yield of wheat/maize (q/ha) under different treatments in various KVKs

Technology options	West Bengal				Jharkhand						Bihar						Overall average yield
	Coochbehar	Jalpaiguri	Murshidabad	Avg. yield	Dumka	East Sighbhum	Pakur	Giridih	Gumla	Avg. yield	Nawada	Kaimur	Aurangabad	Sitamarhi	Jamui	Avg. yield	
Farmer's practice (FP)	25.2	28.1	28.5	27.3	38.0	30.0	32.6	32.7	21.0	30.9	31.7	41.0	31	25.3	29.7	31.7	30.0
Recommended dose of fertilizers (RDF)	30.6	32.4	33.4	32.1	43.2	38.0	-	-	30.2	37.1	44.0	40.0	33.3	30.7	38.9	37.4	35.5
Fertilizer doses as per the NE® (IPNI)	29.8	42.1	41.7	37.9	55.3	36.0	46.6	38.1	33.5	41.9	50.0	50.0	36.4	29.0	33.0	39.7	39.8

20.0 INCIDENCE OF LIVESTOCK DISEASES IN WEST BENGAL

During 2013-14, in collaboration with National Institute of Veterinary Epidemiology and Disease Informatics (Formerly Project Directorate on Animal Disease Monitoring and Surveillance; PD_ADMAS) Bengaluru and Eastern Regional Station, Indian Veterinary Research Institute (ERS-IVRI), Kolkata, this Directorate had worked on collecting and compiling the data related to district-wise incidence of various livestock diseases in West Bengal. The Krishi Vigyan Kendras (KVKs) having SMS (Animal Science) or Veterinarians took active role in such an important activity. The outbreak of diseases was reported for each district by the concerned KVK on monthly basis. The reports showed that the diseases like Foot and Mouth Disease (in cattle of Murshidabad), Black quarter (in cattle of Nadia), Goat pox (in goats of Burdwan), *Peste des Petits Ruminants* (in goats of Burdwan), Fowl pox and Duck Plague (in poultry species of Burdwan) were predominant. The related data have been presented in Table.

Mouth lesion of FMD in cattle

Hoof lesion of FMD in cattle

Lesion of PPR in goat

Ranikhet disease in poultry

Table: District-wise incidence of livestock diseases in West Bengal reported during 2013-14

Sl. No.	Name of the disease	District where outbreak started	Species affected	No. of outbreak	No. of animals fell sick	No. of animals died	No. of animals at risk
1.	Foot and Mouth Disease	Birbhum	Cattle & Buffalo	01	12	0	581
		Murshidabad		01	17	0	400
2.	Anthrax	Nadia	''	02	03	01	418
		Murshidabad	''	01	04	0	500
3.	Black Quarter	Nadia	''	03	09	05	720
		Hooghly	''	01	02	0	100
		Purulia	''	01	01	01	100
		Howrah	''	01	01	0	100
		Uttar Dinajpur	''	01	08	03	130
4.	Haemorrhagic Septicaemia	West Midnapore	''	02	05	04	900
5.	Babesiosis	Howrah	''	01	01	0	100
		Uttar Dinajpur	''	01	04	01	100
6.	Theileriosis	Hoiwrah	''	02	03	0	200
7.	Goat pox	Howrah	Goat	01	01	0	100
		Burdwan	''	03	485	55	2800

8.	*Peste des Petits Ruminants* (PPR)	Purulia	''	01	01	0	100
		Birbhum	''	01	15	02	150
		West Midnapore	''	01	01	0	100
		Murshidabad	''	02	51	12	313
		Burdwan	''	01	250	31	800
9.	Orf (Contagious ecthyma)	Burdwan	''	01	10	0	25
10.	Ranikhet Disease	Nadia	Poultry	03	75	32	950
		Hooghly	''	02	35	18	500
		Purulia	''	01	08	02	100
		Howrah	''	01	27	05	200
11.	Fowl pox	Howrah	''	01	01	0	100
		Burdwan	''	02	218	30	800
12.	Duck plague	Hooghly	''	01	21	10	268
		Burdwan	''	01	156	75	900

21.0 WHEAT DEMONSTRATION IN WEST BENGAL

During November 2013, it was conceptualized at the Council that small plot demonstrations (about 100 sq. m. area) of suitable wheat varieties (for late sown condition and heat tolerant) needed to be conducted by KVKs of West Bengal in the line of varietal trials in order to popularize the wheat varieties in commonly non-growing areas . For this purpose, 5 KVKs of northern part of West Bengal, namely, Murshidabad, Coochbehar, Jalpaiguri, Dakshin Dinajpur and Uttar Dinajpur were initially selected. But due to delayed seed supply, 2 KVKs, i.e., Dakshin Dinajpur and Uttar Dinajpur , could not undertake the trial. Each of the KVKs carrying out the trial was provided with 1 kg seed of each variety (list enclosed). The results of the trial revealed the variety that was best suited in the particular district and the best yield obtained (Table).

Table: Performance of wheat varieties in commonly non-growing areas of West Bengal

Sl. No.	Name of the KVK District	No. of wheat varieties tested	Best variety w.r.t. yield	Yield obtained (q/ha)
1.	Murshudabad	14	HD 2888	37.5
2.	Coochbehar	32	PH 1940	38.0
3.	Jalpaiguri	16	PBW 343	32.4

22.0 PUBLICATION OF ZONAL PROJECT DIRECTORATE

Research publication

i. Roy S K, Pal PP and Singh A K 2014 Extension approaches for production and distribution of seed in India SATSA Mukhapatra Annual Techinical Issue 18 :38-47 (Invited paper)

ii. Das, I, Sahu N C and Roy S K 2014 Soil fertility management practices for productivity enchantment of black gram in some constrained acidic soils of West Bengal . Indian Journal of Agricultural Sciences 84 (4): 544–8

iii. Singh, A K, Pal P P and Roy S K 2014. Rice based farming systems in ensuring food and nutritional security Souvenir Eastern zone Regional Agricultural Fair 2013-14 pp23-25.

iv. Jana C, Rahman F H, Mondal S K, De H K and Singh A K 2014. Management practices and perceived constraints in goat rearing in Burdwan district of West Bengal. *Indian Research Journal of Extension Education* (Accepted)

v. Attupuram N M, Patel B H M, Rahman F H, Mondal S K and Singh A K 2014. Behavioural activities of purebred Landrace boars under different mating regimens. *Journal of Research* (Submitted)

vi. De, H K, Saha G S and Jayasankar P 2013. Twenty five years of freshwater aquaculture extension research in the Central Institute of Freshwater Aquaculture, Bhubaneswar, Odisha – a review, *Indian J. Fisheries* 60(3): 135-139.

vii. Radheyshyam, Saha G S, Lekha Safui, Eknath A E, Adhikari S, De H K, Barik N K and Chandra S 2013. Status and economy of community fish farming in rural Odisha. *Indian J. Fisheries* 60(4): 59-67.

viii. De, H K, Saha G S and Radheyshyam 2013. Aquaculture field schools to promote farmer to farmer extension. *J. Global Comm* 6(2) : 77-85

ix. De, H K, Saha G S, Panda N and Mahapatra A S 2010. Effectiveness of training programmes on freshwater aquaculture conducted by CIFA. *J. Aqua*. 18:31-36.

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i. Mondal S K, Singh A K, Rahman F H, Roy S K, Pal P P and De H K. 2014. More profitable piggery enterprise through various managemental interventions – Case of a tribal district of Jharkhand, India. In: Abstracts of International Conference on Small societies-Small business-Small cities & villages, to be held at Athens Institute for Education and Research, Sardinia, Akarnania, Greece during August 25-26, 2014. (Accepted for oral presentation)

ii. Mondal S K, Rahman F H, Roy S K, Pal P P and Singh A K. 2014. Reducing feed cost in pigs through using locally available feed resources. In: Abstracts of National Seminar on "Biotechnological approaches to challenges in animal health and production" and 2nd Annual meeting of Society of Veterinary Science and Biotechnology held at CVSc & AH, UPPDDUPCVV evam GAS, Mathura, India, during March 06 – 07, 2014.

iii. Singh A K, Roy S K, De H K, Banik N C, Rahman F H, Pal P P and Mondal S K. 2014. Staggered community nurseries for delayed monsoon in the Eastern part of the country – A climate resilient approach. In: Book of Abstracts of National Seminar on "Adaptation and mitigation strategies of climate change for sustainable livelihood" held at Uttar Banga Krishi Viswavidyalaya, Pundibari, Coochbehar, India, 28 – 29.

iv. Singh A K, Mishra S K and Roy S K 2014. Imparting Resilience to Climate Variability through Rejuvenation of Land & Water Resources. World Congress on Agroforestry 2014, 10-14 February 2014, Delhi, India. (wca2014-1982)

v. De H K, Rahman F H, Mondal S K Pal P P Roy S K and Singh A K 2014. Scouting farm nnovations- how important it is for extension. Abstract submitted to International conference on Horticulture for nutritional, livelihood and environmental security in Hills : opportunity and challenges to be held at Kalimpong during 22-24 May 2014

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23.0 DISTINGUISH VISITORS

KVK	Date	Name of the person	Purpose of visit
Nicobar	26.06.2013	Mr. Ved Prakash, Under Secretory, ICAR	Monitoring of TSP & KVK works
Port Blair	21.06.2013	Dr. N K Krishna Kumar, DDG (Horticulture)	Institute foundation day
Araria	01.03.2014	Shri Ajay Kumar Choudhary, DM, Araria	Technology Week
Arwal	24.02.2013	Dr. Ram Kishor Singh, Ex-MLC	KVK visit
Aurangabad	03.09.2013	Mr. Jon Barier Consultant CRS	IRRAS TAC meeting
Banka	12.09.2013	Smt. Sweta Kumari, Chairman of Zila Parishad, Banka	KVK visit
	14.09.2013	Sri B. Kartikey, DM, Banka	KVK visit
Bhagalpur	28.01.2014	Dr. V. L. Chopra	KVK visit
	10.02.2014	Dr. Shiv Kumar Agrawal ICARDA, Morocco	KVK visit
Bhojpur	13.11.2013	Dr Y V N Murthy, Regional Executive, FAI, Kolkata	Seminar on Fertilizer &Integrated Nutrient Management
	27.11.2013	Dr Manbodh Prasad ,State Marketing Manager,IFFCO,Bihar	Extension Personnel Training
Buxar	20.11.2013	Mr. Vinod Singh Gunjiyal, IAS, District Majistrate, Buxar	Visited KVK farm visit.
	06.03.2014	Mr. Michal J. Pott, Regional Technical Officer by catholic relief services Asia region	Visit the IRRAS-IRRI Trails
East champaran	15.04.2013 27.08.2013 20.12.2013	MLA, Kalyanpur, Kesariya and Motihari	Regarding on going farmers programme followed by subsides Programme
Jehanabad	15.01.2014	Md. Amzad Maroof, PD, ATMA, Jehanabad	Inauguration of Kisan Salahkar Training of 1st batch
Jamui	25.12.2013	Sri Narendra Singh, Agri. Minister, Government of Bihar	KVK Visit

KVK	Date	Name of the person	Purpose of visit
	18.02.2014	Sri. Brhamdeo Rawat, Chairman, District Council, Jamui	KVK Visit & Participation in TW
	25.12.2013	Sri. Sumit K. Singh, MLA, Chakai	KVK Visit
	25.12.2013	Sri. Ajay Pratap Singh, MLA, Jamui	KVK Visit
Kaimur	02.04.2013	Sri Arvind Kumar Singh, D.M., Kaimur	KVK visit
	02.04.2013	Sri Nagendra Prasad Singh, Chief Forest Conservator, Patna	KVK visit
	01.11.2013	Sri Chiranjeev Prasad , IPS, DIG, CRPF, Patna	Visited demonstration unit and Medicinal garden.
Katihar	28.09.2013	Sri Narendra Singh Hon'ble Agriculture Minister Govt of Bihar	Visit to KVK, Katihar
	28.09.2013	Sri C.P. Sinha Chairman Rajya Kisan Ayog,Govt of Bihar	Visit to KVK, Katihar
	29.08.2013	Sri Tariq Anwar,Hon'ble Agriculture & Food Processing Industries MInister,Govt of India.	Review Meeting of KVK, Katihar
Madhubani	08.04.2013 24.04.2013	Sri Hukumdeo Narayan Yadav, MP, Madhubani	Attending SAC Meeting
	08.04.2013	Sri Binod Narayan Jha, MLA, Benipatti	Attending SAC Meeting
Munger	06.06.2013	Akhilesh Yadav, ITC,Munger	Visit of KVK, Munger
Muzzafarpur	17.04.2013	Dr. S. L. Mehata, Ex DDG (Extension),ICAR	For Visiting at KVK and review of activities
Nalanda	11.05.2013	Kim Anderson, Stockholm Environment Institute, Sweden	KVK visit
	14.03.2014	Dr. Frantz w. Gatzweiler,Univ. of Bonn, Centre for development Research, Walter	KVK visit
	14.03.2014	Sri Gaurav Tripathi, IFPRI, NEW Delhi, International Food Policy Research institute, NASC, Complex,	KVK visit
Nawada	25.09. 2013	Sri Lalan Jee D.M. Nawada	KVK visit
Patna	14.06.2013	Sri Bageshwari Pd. Singh, Hon,ble Member,State Farmer Commission,Bihar,Patna	Mushroom production
Rohtas	09.02.2014	Mr. Rajeshwar Raj - MLA, Karakat Assembly Constituency, Rohtas	KVK visit
Samastipur	29.10.2013	Dr. K.D. Kokate, DDG (Agri Ext.), ICAR, New Delhi.	KVK visit
	22.12.2013	Dr. K. L. Chadha, Former DDG(Horti), ICAR, N.ew Delhi	KVK visit
	15.01.2014	Dr. S. S. Baghel,Former VC, CAU, Imphal & AAU, Asam	KVK visit
Saran	01.07.2013	Hon. Janardan Singh Segribal	KVK visit

KVK	Date	Name of the person	Purpose of visit
Sheohar	02.12.2013	Mr. B.N Singh, DM.Sheohar	KVK visit
Vaishali	29.10.2013	Dr. K.D. Kokate, DDG (A.E.) ICAR, New Delhi	Over viewing the work of KVK.
Bokaro	04.09.2013	Dr. A.K. Sharma ,National consaltant, BGRE Ministry Ag. Govt. of India.	Discussion about BGRE programme in Chatra district.
Deoghar	05.03.2014	Sri Ameet Kumar, IAS, D.C., Deoghar	SAC Meeting
Dhanbad	27.11.2013	Ho'ble Minister of Rural Development, Shri Chandra Shekhar Dubey	Mega Gosthi
Godda	28.02.2014	Sri Rajesh Kumar Sharma, DC, Godda	KVK visit
Gumla	18.05.2013	Shri K.N. Gupta, IAS(Retd.), Jaipur, Rajasthan	KVK visit
	22.06.2013	Shri Baleshwar Tyagi, Ex.Minister(U.P.)	KVK visit
	12.07.2013	Shri. Job Zaebavnav, Chief , UNICEF Office, Jharkhand	KVK visit
	01.01.2014	H. S. Choudhary, Political Advisor to CM , Jharkhand	KVK visit
Hazribag	18.11.2013	Sunil Kumar, DG, CRPF, Hazaribag	KVK visit
	22.02.2013	Dr. R.K Singh,Dy Director, National Horticulture Board,Krishi Bhawan, Kanke Road, Ranchi	Participation in NHB, Exhibition at Dumar, block Churchu, Hazaribag
Koderma	04.12.2013	Dr. Praveen Sankar, DC, Koderma	Visit & Meeting
Palamu	17.05.2013	Sri Nizlingappa, IFS & Secretary, Dept. of , Govt. of Jharkhand	To visit the KVK Farm activities and monitor Training Programme
Ranchi	20.11.2013	Sri N.N.Pandey (Home Sec) Got of Jh	As a speaker in youth conference
	20.11.2013	Sri D. N. Gautam, Ex DGP, Bihar	As a speaker in youth conference
	21.11.2013	Sri Siddharth Tripathi, Sec. Truism, Jh	As a speaker in youth conference
	21.11.2013	Dr. O.R.S. Rao, VC, ICFAI University,	As a speaker in youth conference
	26.01.2014	Sri S.K Satyapati, Sec. Rural development	As a chief guest in republic day
	21.11.2013	Ms Arunima Sinha, First handicapped women to climb mount Everest	As a speaker in youth confrence
Sahibganj	26.06.2013	Mr. Eugene Akondeng,Programme Officer – Asia World Relief, Canada	Visit of technology park of KVK
	02.02.2014	Sri. A. Muthu Kuma, IAS Dy. Commissioner, Sahibganj	Inauguration of Kisan Mela

KVK	Date	Name of the person	Purpose of visit
	26.02.2014	Ms. NancyTenborek Develop Consultant World Renew, Bangladesh	Mushroom Unit
Burdwan	09.02.2013	Dr. Saumen Mahapatra, Minster In-Charge, Govt. of West Bengal and Mr. Sanjay Mitra, Chief Secretary, Govt. of West Bengal	KVK visit
	10.02.2013	Mr. Malay Ghatak, Minster In-Charge, Agril., Govt. of West Bengal and Mr. Swapan Debnath, Minster of State, M.&S.S.E., Govt. of West Bengal	KVK visit
	19.02.2014	Mr. Tapan Chatterjee, MLA, Purbasthali Uttar	KVK visit
	14.02.2014	Mr. Banamali Hazra, MLA & Chairman, Agril. Marketing and Fisheries Standing Committee	KVK visit
Nadia	15.05.2013	Prof. Md. Rafikul Haque, VC, Bangladesh Agriculture University	KVK visit
	25.07.2013	Dr. S. Ayyappan, DG, ICAR, New Delhi	Convocation of the university
North 24 Parganas	24.02.2014	Mr. C.Sarkar, Deputy Sec.,Dept.of Finance, GOI	Visit to KVK campus
Purulia	05.04.2013	Mr.Atanu Kumar Bondhopadyay Secretary to Regional Incharge, BPCL, Kolkata	Visit to CSR site.
South 24 Parganas	15.05.2013	Dr. S. Ayyappan, Director General (ICAR) & Secretary (DARE),Krishi Bhawan,New Delhi	Inauguration of Operation theatre, Agricultural contingency plan
	29.06.2013	Dr. G. Kalloo, Ex DDG (Horticulture), Ex Vice Chancellor, JNKV, Jabalpur	For inspection of KVK over all activities
	07.11.2013	Sri Ashok Thakur, Secretary, Dept of FPI & Horticulture, GOWB	To attend seminar on '*Joynagar-er Moa*'
	17.01.2014	Mrs. Nandini Chakraborty, Secretary, SDB, GOWB	For monitoring SDB sponsored Nutrition project.
	24.08.2013	Prof. Tarun Kanti Naskar, MLA, Joynagar, WB	To attend SAC meeting
Uttar Dinajpur	19.02.2014	Mr.T.T.Sonamula, ADM & AEO, Uttar Dinajpur Zilla Parishad	To attend orientation programme on PPV&FRA
West Midnapur	08.05.2013	Dr. Sukumar Hansda, Hon'ble Minister Incharge, Paschimanchal Unnayan, Govt. of West Bengal	To Inaugurate Workshop on Turmeric Cultivation
	09.05.2013	Dr. A.K.Mitra, Director In-charge	To deliver lecture in Workshop on Turmeric Cultivation

24.0 AWARDS

Sl. No.	KVK	Name of the Award	Name of the Farmer	Year	Conferring Authority	Amount	Purpose
1	Bankura	Krishak Samman Pusarskar-2013	Mrs Sabita Pramanik	2013	Chief Minister, Govt. Of West Bengal, Dept. of Agriculture	Rs. 50,000	Agricultural production and Extension of technology
2	Bankura	Krishak Samman Pusarskar-2013	Kiran Sankar Roy	2013	Chief Minister, Govt. Of West Bengal, Dept. of Agriculture	Rs. 50,000	Promotion and production of Strawberry in red and lateritic belt
3	Birbhum	Mahindra Samriddhi Agri Award - 2014	Sri Abhishek Mondal	2014	Sri Anand Mahindra		To popularize Mechanization in Potato Planting
4	Purulia	Krishi Ratna	Mr.Arun Majee	2013	Govt. of West Bengal	Rs. 10,000	Out Standing performance of vegetable seedlings production
5	Purulia	Krishi Ratna	Mr. Meher Ali Ansary	2013	Govt. of West Bengal	Rs. 10,000	Outstanding performance of pointed gourd production.
6	South 24 parganas	Best Krishi Vigyan Kendra Award (National), ICAR	KVK South 24 Pargans	2013	Indian Council of Agricultural Research	Rs. 12,00,000	Outstanding contribution in Extension Education
7	South 24 parganas	Krishi Vigyan Kendra Samman in the Mahindra Samriddhi India Agri Award	KVK South 24 Pargans	2014	Mahindra & Mahindra Ltd.	Rs. 2,11,000	This is in recognition to a "Krishi Vigyan Kendra for its purposeful and noteworthy contribution to the field of Agriculture, having a positive impact on the farming communities, thus enabling them to RISE.
8	Uttar Dinajpur	Krishak Samman	Sk. Soleman Ali	2013	Govt. of WB	Rs. 10,000	Agricultural Production and Extension
9.	Jehanabad	Progressive Punjab Agriculture Summit 2014	Sri Dayanand Sharma	2014	Punjab Government	Rs. 51,000	Intensive Agriculture
10	Naland	Best progressive farmer award	Sri Rakesh Kumar	2014	Govt. of M.P.	-	World record in potato & Onion
11	Saran	Best Innovators Award	Shri Indra Mohan Singh	2013	Government of Bihar	Rs. 1,00,000	

12	Godda	National meet of innovative horticultural farmers	Ram Dular Mahto	2013	Director IIHR , Bangalore	-	Innovation (Multi layer vegetable cropping system)
13.	Koderma	Most successful yong agri-preneur of Koderma	Shri Raj Kumar Singh	2013	Govt. of Gujrat	Rs. 5,10,000	Innovative farmer
14	Ranchi	Excellence Letter (Prasasti Patra)	Shri Radhakant Giri,	2013	Honored by the former President of India Her Excellency Dr. (Mrs.) Pratibha Patil.		Achievement in Bee-keeping,
15	Sahibganj	Gujarat Agro Industries Corporation Farmers Award	Sri Uttam Kuswaha	2013	Govt. of Gujrat	Rs. 51,000	Contribution in adoption of SRI technology
16	Sahibganj	Kisan Shree (First)	Sri Vasudev Durbey	2013	Gov. of Jharkhand	Rs. 15,000	Performance in SRI method
17	Pakur	Krishi Karmanya award 2012-13	Smt. Dulari Kishku	2014	Ministry of Agriculture and cooperation, GOI	Rs. 1,00,000	Highest productivity of gram

Awards

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