वार्षिक प्रतिवेदन ANNUAL REPORT

2014 - 15



ICAR-Zonal Project Directorate, Zone-II Bhumi Vihar Complex, Salt Lake, Kolkata - 700097



ICAR-ZONAL PROJECT DIRECTORATE, ZONE-II

Bhumi Vihar Complex, Sector-III Block - GB, Salt Lake, Kolkata - 700 097 Phone : 033 2335 2355, 2335 3830 Fax : 033 2335 2355 Email : zpdkolkata@gmail.com zpd.zone2@icar.gov.in Website : www.zpdkolkata.org

Published by

Dr. A. K. Singh Zonal Project Director

Compilation & Editing

S. K. Roy, P. P. Pal S. K. Mondal, F. H. Rahman and K. S. Das

Citation

Annual Report 2014-15 ICAR-Zonal Project Directorate, Zone-II Kolkata, West Bengal. India

Printed at

Eastern Printing Processor 93 Dakshindari Road, Kolkata - 48





PREFACE

iversification of per-

formance has been the

jurisdiction

essence of achievements

pertaining to Zonal Project Directorate and the KVKs

from accomplishing the

set target in mandated

activities, the KVKs under the guidance of Zonal

Project Directorate have

its during last one year. Apart



A K Singh

partnered with a number of national and international institutions/organization like ICARDA, CSISA, IPNI, PDFSR, DWR, NIVEDI, CIFRI and others tobe mutually beneiftted for the cuase of the farmers of this zone.

under

Shouldering social responsibility was another part of KVK functioning which remained largely unfocussed so far. 'Swachh Bharat' Mission of Govt. of India was implemented by the KVKs and Zonal Project Directorate to inculcate the sense of cleanliness among the common citizens through various programmes at office premises as well as in the rural settings. Approaching rural schools to create awarness in the tender mind of young children about the significance of agriculture in the very sustenance of mankind as well as showing accolade to the people engaged in this noble profession was another initiative taken at the level of Zonal Project Directorate through KVKs. The KVKs have been tried to make an integral part of social system through such programmes.

However, the Directors of Extension Education of State

Agricultural Universities and the host organizations of KVKs amply supported the efforts of Zonal Project Directorate in providing desired directions to KVKs. The road map received from Indian Council of Agricultural Research, New Delhi made the task of Zonal Project Directorate easier to address issues like convergence, linkage, technological backstopping and above all farmers first in all the endeavour. The Annual Report 2014-15 has been compiled to systematically arrange the achievements of Zonal Project Directorate, Directoates of Extension Education and KVKs of this zone as a synchronized document for its use by the intended stakeholders.

I express my gratitude to Dr. S. Ayyappan, Secretary, DARE and Director General, ICAR, Dr. A.K. Singh, DDG (AE) for their continued guidance and support in implementing the mandate.

I am thankful to the Vice Chancellors and Directors of Extension Education of SAUs and Animal Science University and the Directors of ICAR Institutes in Zone-II for providing necessary technological backstopping to the KVKs.

I extend my thanks to all the Programme Coordinators and the staff of the KVKs in the Zone for their dedicated efforts in implementing the mandated activities and furnishing the necessary information for preparing the report.

My thanks are also to all the scientists of the Directorate for their help in compiling and analyzing data, preparing manuscript and bringing out the Annual Report. Continuous support from the administrative, accounts and other staff of the Directorate is duly acknowledged.

Smil

A.K. Singh Zonal Project Director

Kolkata 20.07.2015



CONTENTS

		Page No.
	Executive Summary	i
1.0	Organizational Structure and Staff Position	1
	1.1 Profile	1
	1.2 Budget Provision	2
2.0	Krishi Vigyan Kendra	4
3.0	About Zonal Project Directorate	8
4.0	Achievements	11
	4.1 On-Farm Trial	11
	4.2 Frontline Demonstration	28
	4.2.1 Kharif oilseeds	29
	4.2.2 Rabi oilseeds	29
	4.2.3 Kharif pulse	30
	4.2.4 Rabi pulse	31
	4.2.5 Other crops	32
	4.3 Training Achievements	35
	4.4 Extension Activities	48
	4.4.1 Other extension activities	51
5.0	Production of Seed/Planting material and Bio product	52
	5.1 Seed	52
	5.2 Planting Material	54
	5.3 Bio Product	57
	5.4 Livestock Product	57
6.0	Soil, water and plant sample analysis	58
7.0	Scientific Advisory Committee	59
8.0	Publication by KVKs	59
9.0	Technology Week	60
10.0	Other Programmes	60
	10.1 RAWE Programmes for ARS Scientists	60
	10.2 Study on Incidence of Livestock Diseases	61
	10.3 Nehru Yuva Kendra Training	61
	10.4 BSF Personnel Training	61
	10.5 KVK in Rural School	61
	10.6 Swachh Bharat Abhiyan	61
-	10.7 National Science Day	61
	10.8 PPV&FRA	62
11.0	Performance of Rainwater Harvesting Structure	62
12.0	Technological Backstopping by DEEs	63
13.0	Agricultural Technology Information Centre	64
14.0	HRD Programme	64
15.0	Revenue Generation	65
16.0	National Farmers' Portal	66
17.0	Tribal Sub-Plan	68
18.0	National Initiative on Fodder Technology Demonstration	69
19.0	National Innovations on Climatic Resilient Agriculture	70
20.0	International Plant Nutrition Institute	74
21.0	Publication	76
22.0	Distinguished Visitors to KVKs	81
23.0	Awards	86
	· · · ·	



वार्यकारी सारांश

क्षेत्रीय परियोजना निदेशालय, जोन— ।। तथा इसके अधिकारक्षेत्र के तहत बिहार, झारखंड और पश्चिम बंगाल और अंडमान एवं निकोबार केन्द्र शासित प्रदेश में फैले 83 कृषि विज्ञान केंद्रों (केवीके) का निष्पादन मूल्यांकन इसके अधिदेशित और अन्य क्रियाकलापों के बीच एक ऐसा उचित संतुलन परिलक्षित करता है, जो सभी हितधारकों की आंकक्षाओं की पूर्ति करता है। राज्य कृषि विश्वविद्यालयों के शिक्षा निदेशालयों तथा अन्य हॉस्ट संगठनों से प्राप्त समर्थन से क्षेत्र (जोन) के हितधारकों को समग्र रूप से प्रौद्योगिकी एवं सूचना सहायता उपलब्ध कराने में, कौशल उन्नयन, उद्यमशीलता विकास तथा अन्य संबंधित विषयों में उनकी आवश्यकताओं की पूर्ति करने में सहायता प्राप्त हुई।

अधिदेशित क्रियाकलापों के आधार पर कृषि विज्ञान केंद्रों ने अपने प्रयासों को किसानों, कृषिरत महिलाओं, ग्रामीण युवाओं तथा विस्तार कार्मिकों को ज्ञान और कौशल उपलब्ध कराने की दिशा में केंद्रित किया ताकि उन्हें उन्नत कृषि क्रियाओं को अपनाने तथा उन्हें सूचना संबंधी सहायता उपलब्ध कराकर खेतिहर समुदाय का सशक्तिकरण करने में उन्हें कौशलयुक्त और ज्ञानवर्धक बनाया जा सके। इस संबंध में, कृषि विज्ञान केंद्रों ने किसानों और कृषिरत महिलाओं के लिए 7848 प्रशिक्षण कार्यक्रमों, ग्रामीण युवाओं के लिए 2092 पाट्यक्रमों तथा विस्तार कार्मिकों के लिए 781 पाट्यक्रमों का आयोजन किया। इन कार्यक्रमों से 2,27,663 किसान और कृषिरत महिलाएं, 48,291 ग्रामीण युवा तथा 25,612 विस्तार कार्मिक लाभान्वित हुए।

कृषि विज्ञान केंद्रों के स्तर पर प्रशिक्षण की आवश्यकता का निर्धारण किए जाने से उन्हें तीन ग्राहक समूहों के लिए अपने प्रशिक्षण कार्यक्रम को सुसंगत बनाने हेतु योजना बनाने में सहायता मिली। अन्य अधिदेशित क्रियाकलाप, नामतः प्रौद्योगिकी के मूल्यांकन और उन्नयन को रूपरेखा देते हुए कृषि विज्ञान केन्द्रों ने 6134 स्थानों में आयोजित 620 ऑन—फार्म परीक्षणों के माध्यम से 406 प्रौद्योगिकियों का मूल्यांकन किया। इस क्रियाकलाप के लिए, किस्मगत मूल्यांकन, समेकित फसल प्रबंधन, समेकित नाशीजीव एवं रोग प्रबंधन, कृषि औजार, मूल्य वर्धन, आहार प्रबंधन, पशु उत्पादन प्रबंधन इत्यादि जैसे क्षेत्रों की पहचान की गई। कृषि विज्ञान केंद्रों द्वारा नई विमोचित किस्मों / कृषि विधियों के लिए अग्रपंक्ति के प्रदर्शन आयोजित कर उत्पादन क्षमता का आकलन भी किया गया। प्रदर्शन के आधार पर, पूर्ण पैकेज और संघटक प्रदर्शन दोनों के रूप में अग्रपंक्ति प्रदर्शन के लिए मुख्य तिलहनों, दलहनों तथा अनाज फसलों की पहचान की गई और रबी, खरीफ एवं ग्रीष्म मौसम के लिए तिलहन और दलहन फसलों पर विशेष रूप से ध्यान दिया गया। कृषि विज्ञान केंद्रों ने तिलहनों, दलहनों, अनाजों और अन्य फसलों सहित 3485 हेक्टे. क्षेत्र में 15,677 प्रदर्शन आयोजित किए। यह पाया गया कि प्रदर्शनों के दौरान रबी तिलहनों में 28–48 प्रतिशत खरीफ तिलहनों में 26–82 प्रतिशत, रबी दलहनों में 10–15 प्रतिशत तथा खरीफ दलहनों में 24–120 प्रतिशत की उच्च उपज प्राप्त की गई। धान, गेहूं, मक्का और आलू में क्रमशः 27.4, 23.0, 36.7 और 25.0 प्रतिशत की वृद्धि दर्ज की गई। धान और मक्का में अनेक फसल हाइब्रिडों का भी प्रदर्शन किया गया, जिनमें उच्च उपज प्रतिशत प्राप्त किया गया।

बीज और रोपण सामग्री उत्पादन के संबंध में, कृषि विज्ञान केंद्रों ने अपने फार्म तथा ग्राम बीज उत्पादन कार्यक्रम के माध्यम से विभिन्न फसल किस्मों के बीजों का उत्पादन किया। निदेशालय की समग्र उपलब्धियां यह दर्शाती हैं कि इस क्षेत्र (जोन) में 85,591 किसानों के लाभार्थ अनाजों, तिलहनों, दलहनों, सब्जियों और अन्य फसलों से संबंधित 1,14,300.7 किंव. बीजों का उत्पादन किया गया। तथापि, कुछ क्षेत्रों में पूरे उत्पादन का उठाव नहीं हो पाया। इस निष्पादन से किसानों को पुरानी किस्मों को नई उत्पादित बीज सामग्रियों से प्रतिस्थापित करने में निश्चित रूप से सहायता मिली। कृषि विज्ञान केंद्रों ने राज्य बागवानी बोर्ड और अन्य संगठनों को आपूर्ति करने के अलावा, 16,37,437 किसानों को उपलब्ध कराने हेतु सब्जियों, फलों, फूलों और वन प्रजातियों की 27,57,351 रोपण सामग्रियां उत्पादित कीं।

हालांकि, रासायनिक उर्वरकों की विवेकपूर्ण और संतुलित खुराक / मात्रा के उपयोग से फसलों की उत्पादकता बढ़ती है, परंतु मृदा गुणवत्ता का निर्धारण व मूल्यांकन न किए जाने से प्रायः किसान फसलों में संतुलित खुराक का प्रयोग नहीं कर पाते हैं। जोन–।। के कृषि विज्ञान केंद्रों ने वर्तमान मृदा एवं जल परीक्षण प्रयोगशालाओं के साथ 22,171 किसानों को उनके खेतों में पोषकों की आवश्यकता से जागरूक बनाने हेतु 29,974 मृदा एवं जल नमूनों का विश्लेषण किया। इस प्रक्रिया से कृषि विज्ञान केंद्रों ने वर्तमान प्रयोगशालाओं के अनुरक्षण हेतु 8.63 लाख रूपयों की आय अर्जित की। केवीके

द्वारा किसानों को मृदा स्वास्थ्य कार्ड भी उपलब्ध कराए गए हैं। कृषि विज्ञान केंद्रों ने विभिन्न विस्तार क्रियाकलापों का आयोजन कर किसानों को वैज्ञानिक कृषि विधियों के बारे में, किसानों के लिए सरकारी योजनाओं के बारे में तथा कृषि विज्ञान केंद्रों के पास उपलब्ध सुविधाओं के बारे में जागरूक बनाने हेतु बड़े पैमाने पर जागरूकता सृजन जैसे कार्य किए। कृषि विज्ञान केंद्रों ने 9,49,296



व्यक्तियों की प्रतिभागिता के लिए 1,39,541 उक्त कार्यक्रमों का आयोजन किया। कृषि विज्ञान केंद्रों द्वारा आयोजित मुख्य विस्तार गतिविधियों में फील्ड दिवस, किसान मेला, प्रदर्शनी, पूर्व–प्रशिक्षणार्थी सम्मेलन, वैज्ञानिकों के किसानों के खेतों पर दौरे, नैदानिक (डाइग्नोस्टिक) सेवाएं तथा अन्य कार्य शामिल थे। कृषि विज्ञान केंद्रों ने समाचार पत्रों में 3046 बार विज्ञापन देकर, 286 रेडियो वार्ताओं, 523 टेलीविजन वार्ताओं, 214 लोकप्रिय लेखों तथा 26,091 विस्तार साहित्य के जरिए अपनी उपलब्धियों को प्रकाशित किया।

कृषि विज्ञान केंद्रों की अन्य मुख्य उपलब्धियों में आकस्मिक योजना तैयार करना, 2316 सदस्यों की सहभागिता वाले 78 एसएसी बैठक का आयोजन, रिवोलविंग फंड के रूप में 859.3 लाख रूपयों का अर्जन तथा संसाधन सृजन के रूप में 2.29 करोड़ रूपयों की आय शामिल है।

क्षेत्रीय परियोजना निदेशाालय ने कृषि विज्ञान केंद्रों के क्रियाकलापों की नियमित रूप से निगरानी करने तथा संबंधित जिले में उनकी संसाधन एवं ज्ञान केन्द्र के रूप में छाप छोड़ने हेतु सभी दृष्टियों से उनका मार्गदर्शन करने में सक्रिय भूमिका निभाई। केवीके के कर्मियों को क्षेत्रीय परियोजना निदेशालय (जेडपीडी) स्तर पर या विस्तार शिक्षा स्तर पर या भाकृअनुप के अन्य संस्थानों / भाकृअनुप संस्थानों से हटकर अन्य संस्थानों द्वारा प्रशिक्षण / कार्यशाला आदि के आयोजन के माध्यम से अपनी जानकारी व ज्ञान को बढ़ाने हेत् नियमित रूप से प्रोत्साहित किया गया। पिछले एक वर्ष के दौरान विभिन्न श्रेणियों के 1033 केवीके कार्मिकों के लिए इस प्रकार के 27 कार्यक्रम आयोजित किए गए। क्षेत्रीय परियोजना निदेशालय स्तर पर स्थापित सहयोग, तालमेल तथा संपर्क से कृषि विज्ञान केंद्रों को राष्ट्रीय मुख्य कार्यक्रमों, सहयोगात्मक अनुसंधान कार्यक्रमों तथा अन्य महत्वपूर्ण कार्यों का हिस्सा बनने में सहायता प्राप्त हुई। अंतर्राष्ट्रीय पादप पोषण संस्थान के पोषण विशेषज्ञ तंत्र कार्यक्रम में 23 कृषि विज्ञान केंद्रों की भूमिका, 31 कृषि विज्ञान केंद्रों की पीपीवी एवं एफआरए कार्यक्रम में भूमिका, एनआईसीआरए परियोजना में 17 कृषि विज्ञान केंद्रों की भूमिका तथा एनआईएफटीडी कार्यक्रम में 14 कृषि विज्ञान केंद्रों की भूमिका अन्य संगठनों के साथ सहयोग करने में अपनाई गई प्रभावी कार्यप्रणाली के उदाहरण हैं। इसके अलावा, जोन–।। के कृषि विज्ञान केंद्र डीडब्ल्यूआर, पीडीएफएसआर, एनआईवीईडीआई, एफओसीटी, आईसीएआरडीए, सीआईएफआरआई तथा अन्य संस्थानों के साझेदार भी हैं।

पिछले एक वर्ष में, कृषि विज्ञान केंद्रों को स्वच्छ भारत अभियान जैसी सामाजिक जिम्मेदारी से भी जोड़ा गया है। समस्त कृषि विज्ञान केंद्रों ने अपने स्थलों को स्वच्छ रखने तथा ग्रामीणों को रोजमर्रा के जीवन में सफाई से जागरूक बनाने के लिए आस–पास के गांवों में इस अभियान को चलाया। कृषि विज्ञान केंद्रों द्वारा अनेक कैंपों का भी आयोजन किया गया। इसी प्रकार से, कृषि विज्ञान केंद्रों ने, एक व्यवसाय के रूप में, विद्यालयी छात्रों को कृषि वीज्ञान केंद्रों ने, एक व्यवसाय के रूप में, विद्यालयी छात्रों को कृषि की ओर आकर्षित करने के लिए ग्रामीण विद्यालयों से संपर्क किया। कुछ मामलों में, विद्यालयी छात्रों को आधुनिक कृषि विधियों के लाभों से रूबरू होने के लिए कृषि विज्ञान केंद्रों में आमंत्रित भी किया गया।

कृषि विज्ञान केंद्रों द्वारा निष्पादित अन्य सहयोगात्मक कार्यक्रम था सार्वजनिक निजी भागीदारी में प्रौद्योगिकी सप्ताह का आयोजन। अधिकतर मामलों में, नाबार्ड ने कृषि विज्ञान केंद्रों द्वारा आयोजित मेले, प्रदर्शनी, सेमिनार, वीडियो, प्रदर्शनी आदि कार्यक्रमों को अपना समर्थन दिया। इन कार्यक्रमों का जिलों के किसानों तथा अन्य हितधारकों पर सकारात्मक प्रभाव पड़ा।

कृषि विज्ञान केंद्रों की अन्य उपलब्धियों में, अनेक प्रायोजित एवं व्यावसायिक प्रशिक्षण कार्यक्रम, सीमा सुरक्षा बल, एनवाईके के कार्यकर्ताओं, एटीएमए के सदस्यों तथा अन्य के लिए विशेष प्रशिक्षण के आयोजन शामिल हैं। भाकृअनुप के अनेक संस्थानों की प्रौद्योगिकी सहायता को उपलब्ध कराकर सुंदरबन के द्वीप में बसे लोगों की आजीविका में सुधार लाने हेतू एक विशेष पहल भी की गई।

राज्य कृषि विश्वविद्यालयों के विस्तार शिक्षा निदेशालयों ने अपनी प्रौद्योगिकी सहायता के भाग के रूप में तथा कृषि विज्ञान केंद्रों के क्रियाकलापों का पर्यवेक्षण करने हेतु उनका दौरा किया, उनके लिए प्रशिक्षण और कार्यशाला का आयोजन किया और उन्हें एक निश्चित सीमा तक प्रौद्योगिकी उपलब्ध कराने की सुनिश्चितता की।

विस्तार शिक्षा निदेशालय की सक्रिय सहायता तथा कृषि विज्ञान केंद्रों की इस क्षेत्र (जोन) के खेतिहर समुदाय को सेवा देने की कटिबद्धता से वर्तमान में खेती करने की विधि पर एक स्पष्ट प्रभाव पड़ा है। भावी कृषि के कर्णधारकों, अर्थात ग्रामीण युवाओं को भी कृषि की मुख्य धारा से जोड़ने अथवा ऑफ—फार्म आजीविका विकास के लिए सफल प्रयास किए गए। तथापि, यदि मंडल (ब्लॉक) स्तर पर विपणन सुविधाएं उपलब्ध होती तो किसानों के लिए कृषि को लाभप्रद बनाने में अवश्य सहायता प्राप्त होती।



EXECUTIVE SUMMARY

The performance appraisal of Zonal Project Directorate, Zone-II and 83 KVKs under its jurisdiction spread over in the states of Bihar, Jharkhand and West Bengal and in Union Territory of A&N Islands indicates an appropriate balance between the mandated and other activities fulfilling the aspiration of all the stakeholders. Support received from Directorate of Extension Education of State Agricultural Universities as well as other host organizations enabled the zone as a whole to cater to the needs of stakeholders in providing technological backstopping, information support, skill upgradation, entreprenuership development and other related areas.

In terms of mandated activities the KVKs concentrated their efforts towards providing knowledge and skill to the farmers, farm women, rural youths as well as extension functionaries to make them skillful and knowledgeable in practicing improved agricultural practices and empowering farming community with information support. In this process the KVKs conducted 7848 number of training programmes for farmers and farm women, 2092 courses for rural youths and 781 number of courses for extension functionaries The programmes benefitted 227663 number of farmers and farm women, 48291 rural vouths and girls and 25612 extension functionaries. The assessment of training need at the KVK level helped them plan their training programme suitably for the three clientele groups. In attempting another mandated activity namely, technology assessment and refinement, the KVKs assessed 406 number of technologies through 620 onfarm trials conducted in 6134 locations. Areas like varietal evaluation, integrated crop management, integrated pest and disease management, farm implements, value addition, feed management, animal production management etc. were identified for taking up this activity. Establishment of production potential of newly released varieties/practices was also taken up by the KVKs in the form of frontline demonstration. Frontline demonstrations were conducted both as full package and component demonstration based on the requirement of the demonstration. Major oilseeds, pulses and cereal crops were identified for frontline demonstration with major emphasis on oilseed and pulse crops for rabi, kharif and summer season. The KVKs conducted 15677 number of demonstrations in an area of 3485 ha including oilseeds, pulses, cereals and other crops. It was observed that the demonstrations produced 28-41% higher yield in rabi oilseeds, 26-82% in kharif oilseeds, 10-15% in rabi pulse and 24-120% in kharif pulse. Increase in yield in paddy, wheat, maize and potato was recorded to the extent of 27.4, 23.0, 36.7 and 25.0 percent, respectively. A number of crop hybrids in paddy and maize were also demonstrated with higher yield percentage.

In seed and planting material production aspect, the KVKs produced seeds of crop varieties in KVK farm as well as through village seed production programme. The overall achievement indicates that 114300.7 q of seeds pertaining to cereals, oilseeds, pulses, vegetables and other crops could be produced in this zone for the benefit of 85591 farmers. In some cases, however, the entire production could not be disposed of. The performance has definitely helped the farmers in replacing old varieties with the newly produced seed materials. The KVKs also produced 2757351 number of planting materials of vegetables, fruits, flowers and forest species to make available to 1637437 farmers besides providing to State Horticultural Board and other organizations.

Judicious and balanced dose of chemical fertilizer enhance productivity of crops but non-assessment of soil quality often prevents the farmers from applying the balanced dose in crops. The KVKs of Zone-II with the existing soil and water testing laboratories analyzed 29974 number of soil and water samples to make 22171 farmers aware of the requirement of nutrients in their fields. In this process the KVKs earned Rs. 8.63 lakh to maintain the existing laboratories. Soil Health Card has also been made available to the farmers by the KVKs.

Creation of large scale awareness about scientific agricultural practices, availability of government schemes for the farmers and facilities available with the KVKs was duly carried out by the KVKs through organizing various extension activities. The KVKs organized 139541 such programmes for 949296 persons to take part. The major extension activities included field days, kisan mela, exhibition, ex-trainees sammelan, scientists visit to farmers' field, diagnostic service and others. The KVKs also published their achievements 3046 times in newspapers, 286 radio talk, 523 TV talks, 214 popular articles and 26091 extension literature.

The other major accomplishments include preparation of contingent plan, conducting 78 SAC meeting with the participation of 2316 members, accumulation of Rs. 859.3 lakh as revolving fund and Rs. 2.29 crore as resource generations.

The Zonal Project Directorate was involved in continuously monitoring the activities of KVKs and providing guidance in all fronts to make them known in the concerned district as resource and knowledge centre. The KVK personnel were also regularly encouraged to improve their knowledge through organizing training, workshop etc.



either at ZPD level, Directorate of Extension Education level or by other ICAR/other Institutes. During last one year 27 such programmes were organized for 1033 KVK personnel of different cadres.

The collaboration, convergence and linkage established at Zonal Project Directorate level enabled the KVKs to be part of national flagship programmes, collaborative research programmes and other important assignments. Involvement of 24 KVKs in nutrient expert system programme of International Plant Nutrition Institute, 31 KVKs in PPV&FRA programme, 15 KVKs in NICRA project and 14 KVKs in NIFTD programme are the examples of effective mechanism to collaborate with other organizations. Besides, the KVKs of Zone-II are also the partner of DWR, PDFSR, NIVEDI, FOCT, ICARDA, CIFRI and other Institutes.

During last one year, the KVKs have also been associated with social responsibility like Swachh Bharat Abhijyan. All the KVKs carried out this programme both at KVK premises and adjoining villages to make the villagers aware of cleanliness in their day to day life. A number of camp was also organized by the KVKs. Likewise, the KVKs also approached rural schools to infuse dignity among school students about agriculture as vocation. In some of the cases, the school children were invited to the KVKs to expose them towards benefit of modern agricultural practices.

Another collaborative programme taken up by the KVKs was celebration of technology week in public-private

partnership. In most of the cases, NABARD supported the programmes of the KVKs to organize mela, exhibition, seminar, video show etc. The programmes have created positive impact among the farmers and other stakeholder of the districts.

Other accomplishments of the KVKs also include organizing large number of sponsored and vocational training, special training for Seema Suraksha Bal, Volunteers of NYK, members of ATMA and others. A special initiative has also been taken up for livelihood improvement of islands dwellers of the Sundarban with technological support from a number of ICAR institutes.

The Directorates of Extension Education of State Agricultural Universities as a part of their technological backstopping and overseeing the activities of KVKs have made visits to the KVKs, organized training and workshop for the KVKs and ensured to a certain extent the availability of technology to the KVKs.

Efforts put forth by Zonal Project Directorate with active support from Directorates of Extension Education and commitment of KVKs to serve the farming community of this zone have brought visible impact in the present level of farming. The rural youths, backbone of future agriculture, have also been successfully tried to bring in the mainstream agriculture or off-farm livelihood development. However, creation of marketing facility at block level would have helped in making agriculture more profitable for the benefit of the farmers.

— 1. ORGANIZATIONAL STRUCTURE AND STAFF POSITION

Z onal Project Directorate Zone II is the part of Division of Agricultural Extension, Indian Council of Agricultural Research, New Delhi. It is among the eight Zonal Project Directorates of the Country which is monitoring 642 KVKs of the Country. With the up gradation 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 Director General, ICAR and Secretary, DARE. The division is having eight Zonal Project Directorates and KVKs



During the year, a sum of Rs. 5910.5 lakh has been provided to the KVKs in different heads as per detailed below

Budget

Ē	
a k	
.	
(Rs.	
L5	
4	
201	
bu	
luri	
H	
ne-	
0 N	
der	
n	
/Ks	
Y	
0 Ø	
orat	
scto	
Dir	
ŝ	
Ō	
Ā	
ona	
fZ	
t	
spe	
ē	
it in	
dge	
Bu	
le:	
Tab	

Table: Budget in respec	ct of Zo	nal Pro	oject DI	rectora	te & KV	Ks undel	r Zone-II	during	2014	-15 (Rs.	in lak	Сц Ц	
ZPD/KVK			Rec	urring				Non-I	Recurrin	60		Revol.	Grand
	P & A	T.A.	H.R.D	Cont.	TSP Cont.	Total	Equip. & furn	Works	Lib.	Vehicle	Total	Fund	total
Zonal Project Director, Zone- II	168.00	9.75	1.00	25.75	0.00	204.50	9.72	0.00	0.00	4.75	14.47	0.00	218.97
State Agricultural University													
BAU, Sabour, Bihar (20)	1247.43	10.00	3.00	104.45	26.75	1391.63	0.00	0.00	0.00	8.00	8.00	0.00	1399.63
RAU, Pusa, Bihar (11)	502.82	5.50	1.65	55.92	6.95	572.84	0.00	0.00	0.00	0.00	0.00	0.00	572.84
BAU, Ranchi, Jharkhand (16)	693.35	7.90	2.30	28.55	105.90	838.00	0.00	0.00	0.00	0.00	0.00	0.00	838.00
UBKV, Coochbehar, West Bengal (5)	325.25	2.50	0.75	22.40	15.00	365.90	0.00	0.00	0.00	0.00	0.00	0.00	365.90
BCKV, Nadia, West Bengal (3)	228.00	1.50	0.45	16.05	6.10	252.10	0.00	0.00	0.00	0.00	0.00	0.00	252.10
WBUA&FS, Kolkata (3)	167.00	1.50	0.45	16.35	12.30	197.60	0.00	0.00	0.00	0.00	0.00	0.00	197.60
ICAR													
CARI, A&N Islands (3)	181.50	2.50	0.45	7.70	16.00	208.15	0.00	0.00	0.00	0.00	0.00	0.00	208.15
ICAR RCER, Patna, Bihar (2)	79.00	0.75	0.15	7.25	1.05	88.20	6.04	0.00	0.00	0.00	6.04	3.00	97.24
CRRI, Cuttack, Orissa (1)	61.00	1.00	0.15	3.25	2.80	68.20	0.00	0.00	0.00	0.00	0.00	0.00	68.20
IINRG, Ranchi (1)	0.00	0.00	0.00	0.86	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.86
CRIJAF, West Bengal (1)	92.00	0.50	0.15	5.60	2.40	100.65	0.00	0.00	0.00	0.00	0.00	0.00	100.65
Central University, West Bengal (1)	81.00	0.50	0.15	4.50	2.90	89.05	0.00	0.00	0.00	0.00	0.00	0.00	89.05
Deemed University, RKMVU, West Bengal (1)	85.00	0.50	0.15	6.00	2.90	94.55	0.00	0.00	0.00	0.00	0.00	0.00	94.55
State Govt. Undertaking													
SCADA, Bihar (1)	85.00	0.50	0.15	7.00	1.05	93.70	0.00	0.00	0.00	0.00	0.00	0.00	93.70
WBCADC, Kolkata (1)	60.50	0.50	0.15	5.00	2.30	68.45	0.00	0.00	0.00	0.00	0.00	0.00	68.45
NGO													
Bihar (5)	373.39	2.50	0.75	23.55	15.20	415.39	0.00	0.00	0.00	0.00	0.00	0.00	415.39
Jharkhand (5)	430.15	2.88	0.75	12.25	36.45	482.48	2.00	0.00	0.00	0.00	2.00	0.00	484.48
West Bengal (3)	270.61	1.50	0.45	14.10	14.07	300.73	0.00	0.00	0.00	0.00	0.00	0.00	300.73



ZPD/KVK			Reci	urring				Non-F	Recurrin	a σ		Revol.	Grand
	P & A	T.A.	H.R.D	Cont.	TSP Cont.	Total	Equip. & furn	Works	Lib.	Vehicle	Total	Fund	total
Strengthening of DEEs													
DEE, BAU, Sabour, Bihar	0.00	1.50	3.00	8.01	0.00	12.51	0.00	0.00	0.00	0.00	0.00	0.00	12.51
DEE, RAU, Pusa, Bihar	0.00	0.75	1.50	2.75	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
DEE, BAU, Ranchi, Jharkhand	0.00	2.50	3.00	6.50	0.00	12.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00
DEE, UBKV, Coochbehar, WB	0.00	0.40	1.00	1.60	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00
DEE, BCKV, Nadia, WB	0.00	0.50	2.00	5.00	0.00	7.50	0.00	0.00	0.00	0.00	0.00	0.00	7.50
DEE, WBUA&FS, Kolkata, WB	0.00	0.38	1.50	2.12	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
GRAND TOTAL	5131.00	58.31	25.05	392.51	270.12	5876.99	17.76	0.00	0.00	12.75	30.51	3.00	5910.50





2. KRISHI VIGYAN KENDRA

K rishi Vigyan Kendra is a frontline extension institute in district level spreading over 642 district of the country. It aims at strengthening the technology assessment and refinement system, dissemination of technology generated by the University, supply of critical inputs and reaching the farmers with different solutions of their farming. KVKs also provide technological expertise to the different state and central government agencies involved in agricultural research and extension. In fact, various schemes of the central and state government are

implemented through KVK.

STATE WERE DISTRIBUTION OF KVK:

At present there are 83 KVKs out of proposed 86 KVKs under Zone-II. Host organization-wise distribution showed that 58 KVKs are under SAU, 8 under ICAR, 13 under NGOs, 2 under State Government undertaking, 1 each under Deemed University and Central University as detailed below in the following table

Table: State wise status of Krishi Vigyan Kendras

Name of the	No. of Districts			No	of KVK.	s under			TOTAL
State		SAU	ICAR	DU	CU	NGO	SDA	Oths	
Bihar	38	31	1			5	1		38
Jharkhand	24	16	3			5	-		24
West Bengal	18	11	1	1	1	3	1		18
A&N Islands	3		3						3
Total	83	58	8	1	1	13	2		83

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

Table: Host organization wise status of Krishi Vigyan Kendras

Sl. No.	State/UT	Host Institution	Total
1.	A & N Islands(3)	Central Agricultural Research Institute, (ICAR) Port Blair	3
2.	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, (SCADA) 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
3.	Jharkhand (24)	Birsa Agricultural University, Kanke, Ranchi	16
3		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
		ICAR Research Complex for Eastern Region, Patna	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



Sl. No.	State/UT	Host Institution	Total
	West Bengal (18)	Visva Bharati, Bolpur, Santiniketan (CU)	1
		Central Research Institute for Jute and Allied Fibres, (ICAR) Barrackpore	1
		W.B. Comprehensive Area Development Corporation, (CADC) 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		83

THE GENESIS OF KRISHI VIGYAN KENDRA

Establishment of KVK started in the year 1974 at Pondicherry under Tamil Nadu Agricultural University as a result of recommendation of Dr. Mohan Singh Mehta Committee appointed by ICAR in 1973. Then Planning Commission approved establishment of KVK during different plans leading to number of KVKs to 642 at present. During V Year Plan, 18 KVKs were established, 12 KVKs opened during 1979, 14 during 1981, 44 during VI Five Year Plan were also started. Thus at the end of VI Plan 89 KVKs had started functioning. During VII Plan 20 new KVKs were establisbhed. Success of the KVK in the field of training and agricultural developement led to 74 KVKs in 1992-93 and 78 KVKs during 1992-97 in VIII Plan taking the total number of KVK to 261 during VIII Plan. Following the Prime Minister's Independent Day speech on 15th August, 2014 i.e. declaration of one KVK in each rural district, Indian Council of Agricultural Research established 642 KVKs across the country till date.



Fig: Plan wise growth of KVKs under Zone II

Under Zonal Project Directorate, Zone-II with its jurisdiction of Bihar, Jharkhand, West Bengal and A&N Islands 83 KVKs are operating as on 2015. KVKs in the district of East Midnapore, West Bengal is yet to make functional. Proposal for opening KVKs in larger districts like Murshidabad, Burdwan is under consideration by the Council. There are also proposal for opening new KVKs in Bihar, Jharkhand and West Bengal. The planwise growth of the KVKs under Zone-II are shown in the graph. It indicated establishment of maximum KVK (44) during X plan. 16 KVKs established in VIII plan, 8 in XI plan and 3 during XII plan.

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:

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

Manpower: Staff strength provided to each KVK was 16 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 83 KVKs of Zone II is 1328, out of which 999 (75 per cent) are in position. Details of state wise and category wise staff strength of KVKs are furnished in the following table:

9,41%

Table: Staff position in KVK

Category]	BIHAR		JH	IARKHA	ND		WEST			A & N			TOTAL	
							В	ENGAI	L	IS	LAND	S			
	S	F	V	S	F	V	S	F	V	S	F	V	S	F	V
Programme Coordinator	38	23	15	24	7	17	18	14	4	3	1	2	83	45	38
Subject Matter Specialist	228	186	42	144	98	46	108	81	27	18	14	4	498	379	119
Prog. Assistant	114	89	25	72	39	33	54	38	16	9	4	5	249	170	79
Admn.	76	67	9	48	23	25	36	26	10	6	2	4	166	118	48
Auxiliary	76	55	21	48	31	17	36	29	7	6	4	2	166	119	47
Supporting	76	78		48	47	1	36	43		6	1	5	166	168	
Total	608	498	112	384	245	139	288	231	64	48	26	22	1328	999	331







2,9%

26,11%



SCIENTIFIC ADVISORY COMMITTEE

Scientific Advisory Committee meeting is organized by the KVKs every year to finalize the action plan of the KVK. During the year 78 SAC meeting was conducted out of 83 KVKs of Zone-II. Apart from University authorities, NABARD, different line departments, ATMA, Farmers, AIR, Doordarsan, Lead Bank also participated in these meeting. A total of 2316 Participants were present in these Scientific Advisory Committee meeting. Zonal Project Director or his representative attended the meetings.

Table:	State	wise	SAC	meeting	conducted
by KVł	(s				

State	No. of SAC	No. of participants
A&N Islands	3	38
Bihar	37	1241
Jharkhand	21	609
West Bengal	17	428
TOTAL	78	2316

REVOLVING FUND

The KVKs have been provided revolving fund as one time seed money for making KVK farm self sufficient in terms of resources through seed/ sapling production, use of ponds for fish production and establishment of horticulture orchards. Income generated was used for improvement of the farm. Revolving fund reported by 68 KVKs of Zone-II where revolving fund scheme is operating accumulated a net balance was Rs. 8.78 crore as on 1st April, 2015. In the year 2014-15, a substantial amount of fund i.e. 7.06 core was generated by the KVKs of Zone II through revolving fund scheme. As per state is concerned, Bihar KVKs earned the amount of Rs. 489.90 lakh, West Bengal KVKs earned 317.9 lakh and Jharkhand KVKs earned Rs. 67.15 lakh through this scheme in the year 2014-15. The detailed status of revolving fund of KVKs under Zone II has been presented in table

Table: Status of operating revolving schemeby the KVKs

State	Opening balance as on 1st April	Income during the year	Expenditure during the year	Net balance in hand as on 1st April of each year (Kind + cash)
Bihar	54406056.29	35074023.9	27959983.45	48993350.29
Jharkhand	6408866.00	6715701.00	5938537.00	7024943.00
West Bengal	21313682.25	28850111.1	17682491	31794780.35
Total	82128604.54	70639836	51581011.45	87813073.64

INFRASTRUCTURE FACILITIES

In order to enable the KVKs to accomplish its 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. The details of infrastructure facilities available with the KVKs are given in the table. No additional infrastructure was provided to KVK in in last financial year.

Table: State-wise details of infrastructureavailable with KVKs

SI. No.	Infrastracture	A&N Islands	Bihar	Jhar- khand	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 agroecological situation, existing cropping pattern and farming systems and expectation of the district economy on agriculture. Accordingly, KVKs are working on the following thrust areas:

- Productivity enhancement of cereals, pulses and oilseeds
- Crop diversification and development of alternate land use system
- Establishment of farming system in the region
- Use of resource conservation technology
- Major initiative to combat climate change in the region.
- Contingency planning for monsoon
- Initiative for growth of fodder technology
- Water harvesting and watershed management



- Integrated nutrient, pest and disease management
- Production of quality inputs like seeds of major crops, planting materials etc. and breeds of livestock
- Empowerment of women in terms of improved nutrition, income and drudgery reduction through technological literacy
- 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 selfemployment

3. ABOUT ZONAL PROJECT DIRECTORATE

The network of 642 Krishi Vigyan Kendras spread across the country is the part of Division of agricultural Extension of ICAR. Deputy director General (AE) looks after the administrative, financial and overall functioning of KVKs. Zonal Project Directorates are looking after monitoring the KVK system in the state and district level. The Division of Agricultural Extension of ICAR is supported by eight zonal Project Directorates. The objective of the Directorate is to plan, monitor evaluate and guide the programmes of the KVK and judge the performance of KVKs from time to time.

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 ZCU-II was shifted to Veterinary College Campus, Belgachia, Kolkata for required infrastructural facilities. However, conversion of Veterinary College in to 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 programmes and activities of KVKs.
- Coordinate the work relating to KVKs and ATICs implemented through various agencies such as SAUs, ICAR institutes, voluntary agencies and development departments.
- Coordinate with State/Central Government organizations, financial institutions and other organizations for successful implementation of programmes.
- Partnering with Directorates of Extension Education of SAUs in assured technological backstopping to KVKs and appropriate overseeing of KVK activities.
- Strengthening the Directorates of Extension Education of SAUs with financial support.
- Serve as feedback mechanism from the projects to research and extension systems.
- Implementing projects of ICAR like NICRA, NIFTD and others.
- Maintain close liaison with ICAR headquarter particularly with Division of Agricultural Extension for preparing reports, write ups and other important documents.

Staff: The Zonal Project Directorate, Zone-II, Kolkata is having total sanctioned staff strength of 19, out of which 15 are filled up



Table:StaffstrengthofZonalProjectDirectorate,Zone-II

Category	Sanctioned	Filled
Zonal Project Director (RMP)	1	1
Scientific	6	5
Technical	2	1
Administrative	8	7
Skilled Supporting Staff (Gr. II)	2	1
Total	19	15

INSTITUTE MANAGEMENT COMMITTEE

Institute Management Committee meeting for Zonal Project Directorate was held on 11 April 2014, 14 October 2014. The members were apprised of the functioning of Zonal Project Directorate, achievements and various initiatives taken to monitor the activities of the KVK. In the course of discussion initiative was taken in the field of research. Technological backstopping was also discussed. Suggestion of the members were taken for the effective functioning of the Directorate. Approval for the proposed agenda items were also taken.

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 are presented below.

Fishery Road map: A meeting was held at ZPD, Kolkata on 21 June, 2014 to discuss various aspects of Road map for fisheries research and development in West Bengal. The meeting was attended by the Scientists of Zonal Project Directorate and the SMS of KVKs in West Bengal. A presentation was made on the Fisheries Sector in West Bengal vis-a-vis research and development needs. After initial round of discussion, and having heard the district perspectives, brainstorming was held and consensus reached on the following points for taking initiatives - fish seed certification, its guidelines and legislation need to be developed, needed to stop the breeding and culture of *Clarias gariepinus* and encourage the culture of desi magur *C. batrachus;* promote the monosex male tilapia cultur; improved rohu- Jayanti and other improved fish species to make available widely to the farmers; diversification in fish culture incorporating pabda, fresh water prawn, desi magur and Bhetki (*Lates calcarifer*) in pond system.

Livelihood development of Islands dwellers: Development effort towards improving livelihood, human resource and overall living standard of the dwellers of Bali Islands, Sunderban, South 24 Parganas was continued with the collaboration of CIARI, Port Blair. Zonal Project Directorate acted as a nodal Institution. A training programme was organized to address the problem of the farmers of the Islands in collaboration with ICAR-CIARI, Portblair and Krishi Vigyan Kendra South 24 Parganas, Nimpith. Training was provided to 200 farmers, seed and planting material was provided to 150 farmers, 3 vaccination camp was organized for treating 1123 animals.

NICRA: National Initiative on Climate Resilient Agriculture was initiated in this zone involving 15 KVKs. It includes interventions for crop production, natural resource management, livestock rearing and fish production etc. The main objective was to cope up with the climatic stress which is common during last few years. The KVKs have constituted Village Climate Risk Management Committee (VCRMC) and established Custom Hiring Centres for improved farm implements and machinery which are the main attractions of the project. The VCRMC generated a revenue of Rs. 6.317 lakhs during 2014-15. Details of the achievements under the scheme are given in the report in the subsequent chapter.

NIFTD: Fodder technology demonstrations (FTDs) were started during XI Plan with the objective to disseminate and demonstrate the available forage crops production technologies on the farmers' field in forage deficit regions. To augment fodder productivity, 14 KVKs are involved. The Zonal Project Directorate as the Nodal Institution is coordinating the implementation of the programme through 90 KVKs and 8 Zonal Project Directorates across the country. 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. Demonstration was made on fodder, sorghum, ricebean, barseem, bajra, subabool, stylo, lucaena, seabrana, sudan, grass, cowpea, cenchurus, guinea, hybrid napier, dinanath grass as fodder crop. The entire programme was implemented by the Zonal Project Directorate with technological support from IGFRI, Jhansi.



Monitoring and Surveillance of Animal Diseases (MSAD): This initiative was started in collaboration with PD_ADMAS, Bangalore and IVRI Regional Station, Belgachia, Kolkata with 13 KVKs of West Bengal last year. This programme was spread in all other KVKs of the zone this year. The KVKs have been entrusted to work on surveillance of animal diseases and to report to PD_ ADMAS, ICAR and Zonal Project Directorate. The KVKs reported the outbreak of FMD, PPR, Ranikhet etc. Major vaccination programme was undertaken which covered 51579 animals and birds.

Friends of Coconut trees (FOCT): The programme was launched with the collaboration of Coconut Development Board which 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 2014-15, Eight KVKs (Nadia, Howrah, Hooghly, Cooch Behar, North 24 Parganas, South 24 Parganas, South Dinajpur, South 24 Parganas (RKMVU) of Zone II have successfully conducted FOCT training and a total of 810 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 been implemented in 33.08 ha involving 125 farmers in wheat and maize hybrid .

Assessment of Suitable Cultivar of Wheat: Directorate of Wheat Research is in the process of identifying suitable cultivars for northern part of West Bengal through 5 KVKs namely, Uttar Dinajpur, Murshidabad, Dakshin Dinajpur, Coochbehar and Jalpaiguri of West Bengal and Nawada, Vaishali, Kaimur, Madhubani in Bihar and Ranchi, West Singhbhum in Jharkhand.

Plant Protection Varieties and Farmers' Rights (**PPV&FR**): In view of collecting germplasm and different local races Zonal Project Directorate in collaboration with Protection of Plant Varieties and Farmers' Rights Authority, Ministry of Agriculture, Govt. of India organized training programmes in KVK level. The farmers were educated about effective system for protection of plant varieties, the rights of farmers and other areas. In spreading the provision of this act as well as encourage the farmers to go for registration of their traditional varieties, 31 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 1228 plant varieties.

Memorandum of Statement with PDFSR: Efforts were also directed towards strengthening inter-institutional linkage between PDFSR, Modipuram and ZPD-II, Kolkata to develop and upscale 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.

Swachh Bharat Abhiyan: As a part of social responsibility, Zonal Project Directorate and KVKs under Zone-II observed Swachh Bharat Abhiyan to keep the office surrounding, roads and locality free from garbage, debris and other obnoxious materials. The KVKs carried out the programme in the adjoining villages also to infuse the sense of cleanliness among the mass. The KVKs of Bihar conducted the abhiyan for 69 times, KVKs of Jharkhand for 37 times, KVKs of West Bengal for 88 times and KVKs of A&N Islands for 4 times.

Collaborative Training programme with Nehru Yuva Kendra and Border Security Force: The KVKs of Bihar and Jharkhand were involved in this collaborative programme for providing trianing to the volunteers of Nehru Yuva Kendra as per local arrangements. The training programmes were specifically meant for empowering the youths with adequate knowledge and skill in agribased enterprises to make them self-employed. In such programmes seven KVKs of Jharkhand and eleven KVKs of Bihar were involved to train 948 number of volunteers. The KVKs earned fund worth Rs. 518331/- from district NYK in this process.

Three KVKs each from Bihar and Jharkhand provided training to 914 BSF persons on hi-tech agriculture, mushroom production, fruit cultivation, vermicompost production, animal husbandry and others. Moreover, the higher officials of BSF also interacted with KVKs on developmental activities in agriculture. These two programmes are due to initiative from Zonal Project Directorate Zone II.

KVK in Rural School: Agriculture to make a dignified profession and respectful lievelihood option, children of tender age need to be exposed and taught about the importance of agriculture in survival of human kind. To make the students of primary and secondary level aware of the prospect and contribution of agriculture in our livelihood, KVKs of Zone-II took up sensitization



programme for the school children during last year. Various form of a-v aids, banner, leaflets, flex etc. were suitably used alongwith live materials, models and other form.

Celebration of Science day: Implication of science in our day to day life was highlighted by the KVKs of Zone-II through observation of science day during last year. In this

programme 914 persons from different walks of society actively took part and interacted among themselves to utilize science-based innovations for the improvement in quality of life. Apart from discussion, the KVKs explained the need for greater application of science and technology in different agricultural practices like hi-tech agriculture, climate resilient agriculture and others.

4. ACHIEVEMENTS

4.1 ON-FARM TRIAL

The technologies developed by different institutions were taken up for the assessment and refinement at district level by the KVKs of Zone-II. These technologies were in the areas of crop production, storage technology, value addition, drudgery reduction and animal production and management. Twenty one (21) such thematic areas were identified for assessment and refinement of technologies and presented in the following table.

During 2014-15, KVKs of Zone-II conducted 620 on-farm trials in 6134 locations to asses and refine technologies at KVK level. On-Firm trial conducted in Integrated crop management was 132 which was the higher among all the thematic areas. The other major thematic areas were Integrate Nutrient Management (94), Integrated Pest Management(78), Integrated Disease Management(43),

Varietal Evaluation (47), Weed Management(40), Resource Conservation Technology(26), Value addition(19), Food and nutrition(11) where assessment of technologies were made.

In Animal Production and Management 25 on-farm trials were conducted, while in Fishery 22, Disease Management 12, Feed and Fodder 11, Nutrition and Management 12 OFTs were conducted by the KVKs. Result of the onfirm trials were sent to the line departments, universities and other Institutions for effective dissemination of technologies. Some of the technologies were taken to frontline demonstration for further spread of the technology.

Some of the on-farm trials conducted by the KVKs are presented below with table, photographs and related information.

Table: No of On-Farm Trial conducted by the KVKs

Thematic Area	A & N Islands		B	Bihar		Jharkhand		West Bengal		Total	
	No. of OFT	No. of locations									
Integrated Crop Management (ICM)	3	17	63	629	37	344	29	240	132	1230	
Integrated Disease Management (IDM)	0	0	25	245	7	70	11	93	43	408	
Integrated Nutrient Management (INM)	1	5	48	447	30	295	15	140	94	887	
Integrated Pest Management (IPM)	0	0	40	375	24	247	14	114	78	736	
Varietal Evaluation (VE)	4	22	18	194	16	162	9	75	47	453	
Weed Management (WM)	0	0	28	300	9	98	3	24	40	422	
Storage Technology (ST)	1	7	2	18	2	20	2	18	7	63	
Value Addition (VA)	0	0	13	134	5	43	1	10	19	187	
Resource Conservation Technology (RCT)	2	10	13	121	5	40	6	50	26	221	
Integrated Farming System (IFS)	0	0	0	0	0	0	0	0	0	0	
Drudgery Reduction (DR)	1	4	3	58	1	10	1	20	6	92	
Farm Implements & machineries (FIM)	0	0	4	36	5	44	0	0	9	80	
Food and nutrition ((F&N)	1	5	3	62	3	26	4	28	11	121	
Others	0	0	4	180	0	0	3	52	7	232	
Total	13	70	264	2799	144	1399	98	864	519	5132	

Thematic Area	A & N Islands		Bihar		Jharkhand		West Bengal		Total	
	No. of OFT	No. of locations								
Production and Management (P&M)	2	9	7	86	10	100	6	60	25	255
Nutrient Management (NM)	0	0	3	70	3	26	6	49	12	145
Fishery	1	5	6	46	1	7	14	140	22	198
Feed and fodder	1	5	4	37	2	16	4	42	11	100
Breed Evaluation (BE)	0	0	1	6	0	0	2	32	3	38
Disease management	0	0	9	86	3	26	0	0	12	112
Total	4	19	30	331	19	175	32	323	85	848
Enterprise	0	0	11	123	4	25	1	6	16	154
Grand total	17	89	305	3253	167	1599	131	1193	620	6134

ANDAMAN & NICOBAR ISLANDS

KVK Port Blair

Assessment of various culture practices in carps (C:R:M) and freshwater prawn (M. rosenbergii)

Aquaculture has been an occupational mainstay and also a natural choice of increasing popularity across the Islands. But the availability of quality seed for fishes like IMCs (Indian Major Carps) and freshwater prawn in proper time and quantum needs to be addressed with increasing impetus on the awareness about scientific fish culture to bridge the knowledge gap in culturing practices. Therefore, at KVK Port Blair, a trial was conducted at 5 different locations with three treatments in order to assess the performance of fishes under various culturing situations. The results showed that the TO-II, i.e., Fish Seed (C:R:M)+ Prawn seed (150 nos) + Feed (Rice bran + Groundnut cake) + lime (@ 70 kg/pond with other pond management practices, performed well in terms of growth as well as economics of rearing. The yield increased with TO-II (24.5 q/ha)as compared to 7.0 q/ha using the farmers' practices. Net return of Rs. 326000/ha with B:C ratio of 3.83 was obtained with this TO-II.



Table: Performance of fish and prawn culturing practices with various scientific interventions

Technology option	Average weight (g)	Yield (q/ha)	Gross cost / ha (Rs)	Gross return (Rs/ ha)	Net income/ (Rs/ ha)	B:C ratio
FP: High density single species stocking without any management practices	200	7.00	45000	126000	81000	2.80
TO-I: Fish Seed (C:R:M) + Prawn seed (150 nos) + Rice Bran + lime@70 kg/pond	450	15.75	80000	283500	203500	3.54
TO-II: Fish Seed (C:R:M) + Prawn seed (150 nos) + Feed (RB + GOC) + lime (@ 70 kg/ pond) + pond management practices	700	24.50	115000	441000	326000	3.83

C:Catla, R:Rohu, M:Mrigal

KVK Car Nicobar

Evaluation of performance of various technologies for virgin coconut oil extraction

The Car Nicobar is one of the prominent producers of coconut in the Andaman and Nicobar Islands. Virgin coconut oil (VCO) is gaining in popularity as functional food oil and the public awareness of it is increasing. It is expected that the demand of virgin coconut oil will experience a dramatic increase in the market and it may be a livelihood option in future for coconut producers. The Nicobari tribe of Andaman and Nicobar Islands extracts the coconut oil by the traditional method *i.e.* natural fermentation method for its domestic consumption and religious purpose. The keeping quality of traditionally extracted VCO is very poor; unhygienic and it is also not suitable for long term storage. Moreover, the traditional extraction method of virgin coconut oil takes more time



and labour and usually has more losses of oil. Therefore, it is envisaged that the VCO is to be produced properly under well-managed hygienic conditions with the help of modern technology for protecting tribal health and improving livelihoods of smallholder coconut processors. Keeping this in view, a trial was conducted by KVK Car Nicobar at 7 different locations to evaluate the performance of various extraction technologies for VCO.

Table: Evaluation of virgin coconut oil extraction technologies

Technology option	Yield of oil (liter / 100 kg fresh grated coconut kernel)	resh (Rs/per batch) ernel)		Net return (Rs/ha)	B:C ratio
FP: Natural Fermentation Method	25.3	1500	2024	424	1.3
TO-I: Low Pressure Oil Extraction Method	30.7	1500	3070	1570	2.0
TO-II: Modified Kitchen Method	34.9	1500	6382	4882	4.2

The results revealed that the oil recovery from TO-II was the highest (34.9 litre per 100 kg fresh grated coconut kernel) among the technologies tested. It can be concluded that Modified Kitchen Method is the best and economic for extracting the virgin coconut oil which is being used for home consumption as this oil also has transparent colour with low moisture content.



BIHAR

KVK Arwal

Assessment of performance of various cuscuta control measures in lentil

During the period under report, it has been found that severe incidence of parasitic weed cuscuta in lentil adversely affected crop growth and yield throughout the district. Keeping the severity of the problem in view, KVK Arwal conducted a trial on various weed control measures in lentil at 8 different locations of the district. Problem of cuscuta in tilled crop of lentil was of medium intensity and application of Imazethapyr had burning symptoms on lentil crop. Cuscuta weed becomes visible in the field mostly after 30 DAS of lentil crop. As such spray of



Imazethapyr was less effective on cuscuta especially in case of late sown (after 5 December 2014) lentil crop in tilled fields. However, paira crop gets medium to heavily infested by this weed. Results indicated that cuscuta count/ m² at 40 DAS in different treatments did not differ significantly. However, except TO-I, there was significant reduction in weed count under TO-II and TO-III over FP. Adverse effect of Imazethapyr was noticed on lentil crop as burning symptoms and partial loss of chlorophyll. Average no. of pods/plant of lentil was significantly higher in all the three treatments as compared to FP. However, all the three options were at par.The grain yield of lentil was significantly higher in TO-II and TO-III in comparison to FP. However, TO-I, i.e., Pre-emergence spray of Pendimethalin @ 3.3 l/ha, outperformed TO-III.

Table: Evaluation of various cuscuta control measures in lentil

Technology Option	Weed Count (Cuscuta)/ m² at 40 DAS	Avg. No. of pods/plant	Yield (q/ha)
FP: No control of cuscuta weed	43	48	11.1
TO-I:Pre-emergence spray of Pendimethilin @ 3.3 l/ha	32	62	13.5
TO-II:Spray of Quizalofop Ethyl at 30 DAS @ 50g a.i./ha	27	60	12.9
TO-III: Spray of Imazethapyr 10 % SL @ 40g a.i./ha	24	56	11.7
SEM±	4.6	2.8	0.49
CD 5%	12	6.9	1.4



KVK Aurangabad

Assessment of various scientific techniques of mushroom cultivation

Mushroom is becoming popular day by day due to the public awareness about the qualities it has to be included in the diet. The farmers of Aurangabad district were unaware about how to cultivate the mushroom scientifically. A trial, therefore, was conducted by KVK Aurangabad at 20 different locations to assess the comparative performance of various scientific techniques of mushroom cultivation so that the farmers can be advised to take up the same in coming years. It was revealed from the trial that the highest mushroom production, net return and BC ratio were recorded with TO-IV, i.e., Treatment with chemical (12 hours treatment in bevastin and formalin + poultry manure+weast mahua+urea+cotton seed cake +gypsum+ssp).

Table: Performance of various mushroom cultivation techniques

Technology option	Yield (Kg/q compost)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C ratio
TO-I: Treatment in cold water (48 hours soaking of Paddy straw+poultry manure +wheat bran+ urea+ cotton seed cake+gypsum)	40.0	1000.00	6400.00	5400.00	6.40
TO-II: Treatment in chemical (12 hours treatment in bevastin and formalin+poultry manure + urea+ cotton seedcake+gypsum+ssp)	45.0	1200.00	7200.00	6000.00	6.00
TO-III: Treatment in chemical (12 hours treatment in bevastin and formalin+double dose urea+ cotton cake+potash+gypsum+ssp)	45.0	1300.00	7200.00	5900.00	5.53
TO-IV: Treatment with chemical (12 hours treatment in bevastin and formalin + poultry manure+weastmahua+ urea+ cotton seed cake +gypsum+ssp).	60.0	1500.00	9600.00	8100.00	6.40

KVK Bhagalpur

Assessment of performance of various feeding techniques in laying ducks

Duckery with scientific feeding management can be a viable livelihood option in Bhagalpur district, where the farmers are currently facing a problem of low egg production in ducks due to poor nutrition. In order to address this problem, a trial was taken up by Bhagalpur KVK at 6 different locations of the district involving two different feeding interventions. The results of the trial showed that the highest B:C ratio (1.31) is recorded in TO-II (100 gm formulated feed /day/layer + mineral mixture 0.5 % of total feed + Foraging). Thus, it can be concluded that laying ducks, if supplemented with additional vitamins along with extra feeding, can produce more eggs.

Table: Performance of various feeding techniques in laying ducks

Technologyoption	No. of egg/ duck/annum	Gross return* per duck/annum	Cost of rearing* per duck/annum	B:C ratio
FP: Farmers rearing duck in free range system	105	315.00	273.75	1.15
TO-I: 75 gm formulated feed /day/ layer + foraging	186	558.00	438.00	1.27
TO-II: 100 gm formulated feed /day/layer + mineral mixture 0.5 % of total feed + foraging	256	768.00	584.00	1.31

* Note: Calculation is based on (i) Rs. 3/egg; (ii) Feed cost is 1.50/100 gm

KVK Buxar

Evaluation of various seed treatment techniques in control of wilt in lentil

Yield loss due to wilting of young plant in lentil, caused by fungi *Fusarium* sp., has been a concern in Buxar district. The treatment of seed with *Trichoderma* sp. does have a beneficial effect throughout the period of plant growth.

Keeping this in view, KVK Buxar conducted an on-farm trial at 6 locations. The results of the trial indicated that seed treatment with *Trichoderma* sp. strain Th 1 and *Trichoderma* sp. strain Th 2 @ 10 g/kg seed each were found most effective for the control of wilt disease in lentil. The cost of cultivation (Rs.15300/ha) and net return (Rs.45450 /ha) and B:C ratio (3.97) were also higher in such application.



Technology option	Disease incidence (%)	Yield (q/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ ha)	Net return (Rs/ha)	B:C ratio
FP: No seed treatment with <i>Trichoderma</i> sp.	8.76	9.20	13000/-	41400	28400	3.18
TO-I: Seed treatment with <i>Trichoderma</i> sp. strain Th 1 @ 10 g/kg seed	2.33	13.00	15000/-	58500	43500	3.90
TO-II: Seed treatment with <i>Trichoderma</i> sp. strain Th 2 @ 10 g/kg seed	1.57	13.00	15000/	58500	43500	3.90
TO-III: Combination of the above two	0.0	13.50	15300/-	60750	45450	3.97

Table: Performance of different wilt control measures in lentil

KVK Kishanganj

Evaluation of value added green chili and assessing its storability

Low economic return from green chili has been a problem for chili growers of Kishanganj district due to excessive production and lack of proper storage. This situation warranted for taking up a trial on the preparation of value added green chili pickle for increasing storability to catch remunerative market for higher income. Therefore, a trial was designed by KVK Kishanganj at 10 different locations to assess various qualitative and quantitative parameters of the green chili pickles prepared by various techniques. It was evident from the trial that the pickle prepared with sirka (TO-II) was the best in terms of likeness and taste against TO-I(Pickle prepared with tamarind powder) and FP (Pickle prepared with mustard powder). In terms of keeping quality, TO-II (Pickle prepared with sirka) got longer storability(5-6 months) followed by TO-I(3-4 months). Data presented in the table revealed that the highest net return of Rs. 375/kg was obtained with TO-II with highest B:C ratio of 2.25.Based on keeping quality of product and BC ratio, farmers and farm women may be suggested to prepared pickle with sirka superior to TO-I pickle prepared with tamarind. However they may be adviced to prepare pickle with sirka and pickle with tamarind due to its plenty of availability and cheaper rate in this reason. It will fetch maximum market price.

Table: Performance of various methods of green chili pickle preparation

Treatment	Storability	Palatability	Color	Cost of cultivation (Rs/kg)	Amount of chilli (5kg)	Cost of selling (Rs/kg)	Gross Return (Rs. For 5kg)	Net Return (Rs. for 5 kg)	B:C ratio
FP: Green chilli pickle with Mustard powder	5-6 days	Low	Brownish Yellow Green	64	320	90	450	130	1.40
TO-I: Green chilli pickle with Tamarind powder	3-4 months	Medium	Brownish Red	71	355	115	575	220	1.61
TO-II: Green chilli pickle with Sirka.	5-6 months	High	Bright yellow green	76	300	135	675	375	2.25

KVK Lakhisarai

Assessment of improved kid health management techniques

Lowering of growth rate and higher kid mortality were attributed to the higher incidence of diarrhea and

pneumonia in kids. This problem was addressed by carrying out a trial by KVK Lakhisarai at 10 different locations of the district. A critical analysis of data presented in table below revealed that TO-II, i.e., Colostrum feeding with deworming (Albendazole @ 10 mg/kg body wt)

Table: Survivability rate and growth performance of kids

Technology Option	No. of kids	Kids survivability rate (%)	% increment in body wt.	Cost of rearing (Rs.)	B:C ratio
FP: Colostrum feeding	10	60	16.2	10	1.02
TO-I : Colostrum feeding + Deworming (Albendazole 10 mg/kg b wt.) after 21 st day of birth and repeat after 15 days	10	80	25.5	40	1.30
TO-II : Colostrum feeding + Deworming (Albendazole 10 mg/Bwt) + Antimicrobial (Ciprofloxacin and Tinadazole) after 7 day of birth continued for 3 days given orally	10	90	30.5	130	1.85



and Antimicrobial (Ciprofloxacin and Tinidazole after 7 days of birth and continued for 3 days given orally) to the kids resulted in the highest kids' survivability rate (90%) and 30.5% increase in body weight which were found significant.

KVK Nalanda

Evaluation of performance of seed treatment with biofertilizer in wheat

In order to address the problem of low yield of wheat due

Table: Soil fertility status before and after the trial

to use of untreated seed leading to insufficient supply of nutrients, a trial was conducted by KVK Nalanda at 8 different locations of the district. It was evident from the trial that TO-II, i.e., wheat (DBW-14) along with 2/3rd recommended dose of fertilizer with seed treatment with Azotobacter and PSB, gave the highest yield of 35.05 q/ha, B:C ratio of 2.32 and the highest net return (Rs. 31,500) among the treatment groups.

Initial Soil Status						Final Soil St	atus		
pН	pH O.C. Available nutrients (Kg/ha)				pН	O.C.	Available nutrients (Kg/ha)		
(%) N	Ν	P_2O_5	K ₂ O		(%)	Ν	P_2O_5	K ₂ O	
7.24	0.605	256	29.25	172	7.32	0.625	258	30.20	175

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

Technology option	Yield (q/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C ratio
FP: DBW-14 +NPK::150:50:00 kg/ha	29.50	22,300	45,800	23,500	2.05
TO-I: DBW-14 + RDF NPK:: 120:60:40 kg/ha	34.75	24,600	53,750	29,150	2.18
TO-II:DBW-14 + Seed treatment with Azotobacter + PSB+ 2/3 RDF NPK:: 120:60:40 kg/ha	35.65	23,800	55,300	31,500	2.32
SEM <u>+</u> C.D. (P=0.05)	0.514 1.486	-	-	-	-

KVK Patna

Varietal evaluation of turmeric

The problem of lower yield and therefore the lower profitability in turmeric cultivation has been attributed to the use of local variety by the farmers of Nalanda district. To solve this problem, a trial was conducted by KVK Nalanda at 10 different locations with two improved turmeric varieties. The results showed that use of improved varieties like Rajendra Sonia and Rajendra Sonali had increased the yield, however, the latter gave the highest fresh rhizome yield of 234.29 q/ha with the highest B:C ratio of 2.21.

Table: Performance of different varieties of turmeric

Technological options	Plant height	Average wt. of rhizome (gm)	Fresh rhizome yield (q/ha)	Dry rhizome yield	Gross cost	Gross return	Net return	B:C ratio
FP: Local variety	43.14	401.43	178.29	145.71	75000	142629	67629	1.9
TO-I:Rajendra Sonia	78.71	569.29	222.14	187.43	82000	177714	95714	2.17
TO-II: RajendraSonali	57.14	708.86	234.29	217.29	85000	187429	102429	2.21
CD	6.15	61.58	23.58	16.54				

JHARKHAND

KVK Bokaro

Assessment of various methods of preparing mahua (Madhuca longifolia)ladoo

Huge wastage of mahua flower in the preparation of unhealthy local alcoholic drink and as animal feed, in spite of its being rich in nutrients and its having good health benefits has been identified as matter of concern in Bokaro district. With an objective to address this issue, KVK Bokaro carried out a field trial at 10 different locations of the district on newer methods of ladoo preparation for evaluating them with respect to quality, shelf life and nutritive value of the mahualadoo.It was revealed that shelf life of mahualadoo prepared by new methods enhanced upto 5 weeks (more than one month) by adopting sterilization method of preservation and by the use of emulsifier (GMS 0.1%) which acts as anti-staling agent. Mahualadoos prepared by the use of sterilized mahua syrup, roasted maize flour, roasted groundnut flour and



weeks with ladoos having sweet aroma and pleasant flavour. But overall, TO-II outperformed TO-I.

Table: Nutritive value, shelf life and cost of mahualadoos under three different treatments

Technology options	Protein (g)	Fat (g)	CHO (g)	Energy (Kcal)	Calcium (mg)	Iron (mg)	Shelf life (wks)	Cost of preparation* (Rs/ kg)
FP: Ladoo prepared with local ingredients	3.92	1.28	56.04	251.43	27.47	1.44	1	32
TO-I: Ladooprepared with use of sterilizedmahua syrup and roasted maize flour along with the use of GMS(0.1%)	14.76	15.52	101.30	604.04	62.14	4.06	5	58
TO-II: Ladooprepared with use of sterilizedmahua syrup, roasted maize flour,roasted groundnut flour and sugar along with the use of GMS(0.1%)	19.44	22.04	135.38	818.18	63.74	1.98	5	62

* Price of jar included.

Table: Overall acceptability after sensory evaluation of mahualadooby score card method at various stages

Technology options	Overall acceptability on the day of preparation	Overall acceptability on the 21 st day after preparation	Overall acceptability on the 35 th day after preparation	Ranking
FP: Ladoo prepared with local ingredients	6.9	-	-	III
TO-I: Ladooprepared with use of sterilizedmahua syrup and roasted maize flour along with the use of GMS(0.1%)	7.8	7.6	7.0	II
TO-II: Ladooprepared with use of sterilizedmahua syrup, roasted maize flour,roasted groundnut flour and sugar along with the use of GMS(0.1%)	8.7	8.6	8.0	Ι

KVK Chatra

Effect of Azolla supplementation on the growth and economics of rearing in T&D pigs under commercial production system

T&D pigs are famous for their meat quality in Jharkhand

as well as Chatra district. But the pigs of Chatra district under commercial production systems suffer from slower rate of body growth mainly due to improper feeding. To overcome this problem, a trial was conducted by KVK Chatra at 10 different locations on the effect of azolla feed supplementation on the growth of T&D pig and economics

Table: Growth performance and economics of T&D pigs under commercial holdings

Technology Assesses	Tecl	nnical Param	eter	Economic Parameters				
	Avg. body wt./pig at 3 months	Avg. body wt./pig at6 months	Avg. body wt./pig at 9 months	Cost of cultivation (Rs./pig)	Gross Income (Rs./pig)	Net Income (Rs./pig)	B:C ratio	
FP:Easily available feeding material (Maize 30% + Rice bran 70%)	15.5	29.5	38.300	1800	3447	1647	1.92	
TO-I: Feeding of Maize 65% + Rice bran 14% + Niger cake 15% + Fish meal 5.50% + Mineral mixture 0.5%) + 250 g azolla/pig/ day	16.00	40.2	74.400	3000	6696	3696	2.23	
TO-II: Feeding of Maize 65% + Rice bran 14% + Niger cake 15% + Fish meal 5.50% + Mineral mixture 0.5%) + 500 gazolla/pig/ day	19.00	53.500	81.500	3100	7335	4268	2.71	
TO-III: Feeding of Maize 65% + Rice bran 14% + Niger cake 15% + Mineral mixture 0.5%) + 500 gazolla/pig/ day	17.00	41.00	75.200	2500	6768	4235	2.37	



of pig production under commercial production system. It was found that the highest weight gain of 81.5 kg/pig at the age of 9 months was recorded in TO-II, i.e., Maize 65% + Rice brawn 14% + Niger cake 15% + Fish meal 5.50% + Mineral mixture 0.5%) + 500 gazolla/pig/day. Gross return in TO-II was also the highest among all the technology options (Rs.7335/pig) at 9 months with B:C ratio 2.71.



KVK Garwah

Effect of different feeding regimes on performance of dairy cows

Cow is the most important milch animal and backbone of the rural population.On account of lack of poor management of feed in dairy cow there is low production of milk, which is not sufficient to sell, therefore, farmers are suffering from economic loss. Feed management is one of important tools for increasing milk production to some extent. Therefore, assessment and implementation of available technologies for improvement in milk production was done by KVK Garwah at 10 different locations of the district. The results indicated that average milk production per day and lactation length increased by feeding of concentrate mixture (crushed wheat @ 250 g and crushed gram @ 250 g per day) along with farmers' feeding of green grasses and crop straw while percentage of morbidity rate significantly decreased leading to more economic return to farmers.

Table: Performance of dairy cows with different feeding regimes

Technology Options	Av. Milk prod./day (in lt.)	Lactation length (in days)	Morbidity rate (%)
FP: Feeding of green grasses + crop straw	2.25	219	27.3
TO-I:FP + Linseed cake @ 100 g each per day	2.95	222	10
TO-II: FP + Concentrate mixture in the form of crushed wheat @ 250 g + crushed gram @ 250 g each per day	4.10	230	1.5

KVK Gumla

Effect of plant growth regulator on the yield of tomato in Kharif season

In tomato, the problem of yield loss due to fruit drop has been a major concern. A field trial was conducted by KVK Gumla at 10 different locations of the district to find out the suitable plant growth regulator effective against the fruit drop in tomato. A critical analysis of the data recorded during the trial clearly indicated that TO-I (Spray of GA₃ @ 200ppm before flowering and after fruit set) yielded the highest (178.06 q/ha) with the lowest fruit drop/ plant (3.4) which is significantly superior to FP. The net return of Rs. 86142 was also recorded under the TO-I.Hence, TO-Iis being recommended for better yield and income.

Table: Peroformance of Plant growth regulator on the yield of tomato in Kharif season

Technology option	Data related to problem addressed	Yie	ld compon	ents	Cost of cultivation (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C Ratio
	Numbers of fruit/plant	Plant height (cm)	Nos. of fruits / plant	Yield (q/ha)				
FP : Using of Planofix 4.5 SL @1ml/4 Lit of water before fruit setting	5.8	47.18	24.20	104.53	35000	73171	38171	2.09
TO_1 : Spray of GA3 @ 200ppm before flowering and after fruit set	3.4	68.14	42.10	178.06	38500	134642	86142	3.23
TO_2 : Spray of 2,4-D @ 100ppm before flowering and after fruit set	4.1	61.81	34.60	150.22	37000	105154	68154	2.84
SEm <u>+</u>	0.32	2.93	1.25	10.38				
CD (P=0.05)	0.96	6.21	3.72	30.85				



KVK Hazaribag

Assessment of the effect of deworming and calcium supplement on egg production of Desi hen

Low egg production in desi hen in the district has been attributed to poor health and nutrition of the birds. Keeping this in view, a trial was conducted by KVK Hazaribag at 10 different locations in order to determine the effect of deworming and calcium supplementation on the egg production of Desi hen. The results revealed that TO-III, i.e., Free range system + Deworming + Calcium supplement 1 ml per bird per day (10 days every month for one year) gave highest egg production and B:C ratio.

Table: Performance of Desi hen under various health and nutritional management

Technology option	Av. egg production / year (Nos)	Cost of production Rs./unit	Gross return (Rs.)	Net return (Rs.)	B:C ratio
FP: Free range system without deworming and calcium supplementation	48	4000	12960	8960	3.24
TO-I: Free range system + Deworming every month	65	4190	17550	13360	4.18
TO-II: Free range system + Calcium supplement @1 ml per bird per day (10 days every month for one year)	76	4540	20520	15980	4.51
TO-III: Free range system + Deworming + Calcium supplement @ 1 ml per bird per day (10 days every month for one year)	82	4730	22140	17410	4.68

KVK Koderma

Performance evaluation of kharif onion cv. Agri-Found Dark Red (AFDR) as affected by different date of transplanting

A field trial was carried out by KVK Koderma at 10 different locations to assess the performance of kharif onion cv. Agri-Found Dark Red (AFDR) as affected by different date of transplanting. This trial had a background of identifying a problem of low yield of kharif onion due

to late transplanting. It was clear from the trial that TO-III, i.e., Transplanting by15th July, resulted in the highest yield (290 q/ ha) and recorded a significant increase in yield by 53.43% over the conventional FP of transplanting by 15th August. However, economically better option was TO-II (Transplanting by 30th June) which recorded a B:C ratio of 4.62 as against 4.01 of TO-III. This trial, therefore, recommended a suitable time of transplanting kharif onion between 30th June and 15th July in Koderma condition.

Table: Effect of different dates of transplanting on yield of Kharif onion

Technology option	Avg. yield (q/ha)	% increase	Cost of cultivation(Rs/ ha)	Gross return (Rs/ ha)	Net return (Rs/ ha)	B:C ratio
FP: Transplanting by 15th August	189	-	27600	75600	48000	2.73
TO-I: Transplanting by 15th June	260	37.56	36000	132000	96000	3.66
TO-II: Transplanting by 30 th June	280	48.14	32000	148000	116000	4.62
TO-III: Transplanting by 15 th July	290	53.43	32000	128500	96500	4.01

KVK Ranchi

Integrated management of pod borer in pigeon pea

The problem of reduction in yield of pigeon pea due to heavy infestation of pod borers has been a serious concern throughout Ranchi district. To address this problem, different control measures were tested through conducting a trial by KVK Ranchi at 10 different locations of the district. It was evident from the trial that the TO-II (1st Spray -Azadirachtin 10000 ppm 10 ml/10 lit. water at 50 per cent flowering; 2nd Spray – Emamectin benzoate 5% 3 g/10 lit water 15 days after 1st spray; 3rd Spray – Deltamethrin 1% + Triazophos 35% 25 ml/10 lit water) was the best practice for control of pod borer leading to an increase of 70.51% in yield (13.14 q/ha) over farmers' practice (2 to 3 chemical pesticide sprays consisting of Quinalphos 25 EC etc.) with a B:C ratio of 3.1. Of course, TO-I [(Recommended)Monocrotophos 36 SL (1 ml of /lit water) + Chlorpyriphos 20 EC (3.5 ml/lit of water)] also proved beneficial for the control of pod borer pest.



Technology	% Damaged pods in borer complex	Mean grain damage (%) /plant	Reduction in pod damage (%)	Yield (q/ha)	Net Return in lakh/ha /unit	B : C ratio
FP: 2 to 3 chemical pesticide sprays consisting of Quinalphos 25 EC etc.	36.68	28.56	44.04	7.8	2.3	2.4
TO-I: (Recommended) Monocrotophos 36 SL (1 ml of /lit water) Chlorpyriphos 20 EC (3.5 ml/ lit of water)	18.70	12.11	60.03	11.30	3.1	2.8
TO-II:1st Spray -Azadirachtin 10000 ppm 10 ml/10 lit. water at 50 per cent flowering	12.20	10.79	68.69	13.14	3.3	3.1
2nd Spray – Emamectin benzoate 5% 3 g/10 lit water 15 days after 1st spray						
3rd Spray – Deltamethrin 1% + Triazophos 35% 25 ml/10 lit water						
CD at 5%	4.45	5.29	-	2.73		

Table: Performance of pigeon pea under different pod borer control measures

WEST BENGAL

KVK Bankura

Assessment of performance of application of various Calcium and Sulphur based micronutrient on productivity of groundnut var. TG-51 in Red and Lateritic belt of Bankura

To solve the problem of low productivity and poor oil percentage in nut of groundnut variety TG-51 due to micronutrient deficiency, a trial was conducted by KVK Bankura at 4 different locations. Results revealed that TO-III [Recommended dose NPK (20: 60: 40 Kg)/ha in the form of Urea, SSP,MOP + 200 Kg Gypsum during 30 DAS + 25 Kg Sulphur (during pegging)] was the best in respect of yield, quality and economic parameters. The technology options showed differential effect on final use of groundnut as seed, oil purpose or market as nut. It has been found that the pod yield increased by 18%,

11% and 30% with application of only Gypsum (400 kg/ ha), elemental Sulphur (25 Kg/ha) and a combination of both Gypsum (200Kg) and Sulphur (25Kg). Therefore, a differential source and split over total crop growth stages have been found to produce more yields that were evident from boldness of nuts. The similar trend was also found in quality parameter that is oil and protein content of nut. The Sulphur directly helped in increasing oil content of nuts (42% in FP to 50.6% in TO III) and also helped indirectly the more protein content (22.4 in FP to 24.9 % in TO III) by increasing the nitrogen use efficiency of crop. Seed germination was improved by application of recommended doses of NPK (20-60-40 Kg/ha) in the form of composite fertilizer IFFCO-10:26:26 + 400 Kg Gypsum/ha in two split doses @ 200 Kg at 30 DAS and at the time of Flowering. Seed germination may be influenced due to improvement in nut shell by calcium application through gypsum.

Table: Effect of application of various Calcium and Sulphur based micronutrient onproductivity parameters of groundnut var. TG-51

Technology option	Yi	eld comp	onent	Disease/	Yield	Cost of	Gross	Net	B:C
	No. of plant/ sqmt	No. of pods/ plant	Test wt. (100 grain wt.)	insect pest incidence (%)	(q/ha)	cultivation (Rs./ha)	return (Rs/ ha)	return (Rs./ ha)	ratio
FP: Recommended dose NPK (20-60-40Kg)/ha in the form of composite fertilizer IFFCO 10: 26: 26	40	9	70.0	10.0	22.0	40000	52500	12500	1.3
TO-I:Recommended dose NPK (20- 60-40Kg)/ ha on the form of composite fertilizer, IFFCO 10: 26: 26 + 400 Kg Gypsum/ha (two split doses @ 200 Kg during 30 DAS and flowering stage)	46	20	85.5	10.0	26.0	44000	69000	25000	1.6
TO-II:Recommended dose NPK (20: 60: 40Kg)/ha in the form of Urea, SSP,MOP + 25 Kg Sulphur (during pegging)	42	18	84.0	5.0	24.5	46000	73500	27500	1.6



TO-III: Recommended dose NPK (20: 60: 40 Kg)/ha in the form of Urea, SSP,MOP + 200 Kg Gypsum during 30 DAS + 25 Kg Sulphur (during pegging)	42	20	86.0	5.0	28.5	47000	76500	29500	1.6
SEm(+)			3.2		5.8				
CD at 5%			10.3		16.4				

Table: Effect of application of various Calcium and Sulphur based micronutrient on Qualityparameters of groundnut var. TG-51

Technology options	Oil yield (%)	Protein content (%)	Germination percentage (%)
FP: Recommended dose NPK (20-60-40Kg)/ha in the form of composite fertilizer IFFCO 10: 26: 26	42.0	22.4	50.0
TO-I: Recommended dose NPK (20-60-40Kg)/ ha on the form of composite fertilizer, IFFCO 10: 26: 26 + 400 Kg Gypsum/ha (two split doses @ 200 Kg during 30 DAS and flowering stage)	46.0	23.7	75.0
TO-II: Recommended dose NPK (20: 60: 40Kg)/ha in the form of Urea, SSP,MOP + 25 Kg Sulphur (during pegging)	48.5	24.9	60.0
TO-III: Recommended dose NPK (20: 60: 40 Kg)/ha in the form of Urea, SSP,MOP + 200 Kg Gypsum during 30 DAS + 25 Kg Sulphur (during pegging)	50.6	24.0	70.0
SEm(+)	0.8	0.67	6.0
CD at 5%	2.5	2.2	17.8

KVK Birbhum

Assessment of location specific powdery mildew tolerant cucumber varieties

In order to address the problem of heavy production loss due to infestation of powdery mildew in cucumber, a trial was carried out by KVK Birbhum at 10 different locations. The results indicated that TO-I, i.e., Snow White (powdery mildew tolerant hybrid) variety of cucumber exhibited significantly higher yield (199.75 q/ ha) than that of farmer's practice. It was also observed that TO-I produced significantly greater fruit size (17.56 cm) than other options. The B:C ratio was higher (3.4) with the cultivation of cucumber variety Snow White than Swadist (3.29) and local improved (2.23). But least damage due to powdery mildew infestation was found in the variety Swadist (2%) where as it was 6% in Snow White and 29 % in local improved variety. Keeping all the parameters in view, TO-I may be recommended for the district.

Table: Performance of different powdery mildew tolerant cucumber varieties

Technology option	Av. Fruit size (cm)	Damage due to powdery mildew infestation (%)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs./ha)	Net Return (Rs /unit)	B:C ratio
FP: Local improved	10.25	29	127.50	114350	255000	140650	2.23
TO-I: Snow white (powdery mildew tolerant hybrid)	17.56	6	199.75	117140	399500	282360	3.4
TO-II: Swadisht (powdery mildew tolerant hybrid)	15.64	2	192.80	117110	385600	268490	3.29
SEm <u>+</u>	1.22	-	17.08				
CD(P=0.05)	3.55	-	49.37				

KVK Burdwan

Effect of using non-antibiotic growth promoter in broiler production system

An on-farm trial was conducted by KVK Burdwan at 7 different locations to address the issues relating to antibiotic residues in meat and poor body weight gain in broiler production of the district.The trial was conducted in this district in the month of October and November to evaluate the performance of different non antibiotic growth promoters in broiler production with the aim of judicious use of antibiotics in small scale production system. A significantly higher body weight of broiler (1.98 kg/broiler at 38 days) was achieved through schedule application of probiotic in drinking water whereas no significant difference in growth was noticed between farmers practice and organic acids supplemented group.

Technology option	Yield para	neters	Cost of	Gross return	Net Return	B:C
	Production per broiler at 38 days (kg) (at selling age)	Body wt (kg)/ broiler at 30 days	rearing (Rs/ broiler)	(Rs/broiler)	(Profit) in (Rs/broiler)	ratio
FP: Commercial broiler feed and indiscriminate use of antibiotics	1.78 ± 0.02^{b}	1.25 ± 0.13^{b}	130	142	12	1.09
TO-I: Probiotics as performance promoter and commercial broiler feed	$1.98\pm0.02^{\text{a}}$	$1.39\pm0.12^{\text{a}}$	129	158	29	1.22
TO-II: Organic acid as performance promoter and commercial broiler feed	$1.84\pm0.01^{\rm b}$	$1.26\pm0.06^{\rm b}$	131	147	16	1.12

Table: Growth performance of different technology options with their economics

a b: values with different superscripts in a column differed significantly (p<0.05).

KVK Coochbehar

Assessment of various integrated disease management measures in jute

KVK Coochbehar carried out a trial on integrated disease management in jute at 8 different locations of the district for solving the problem of heavy infestations of stem rot pathogen (*Macrophominasp.*) in jute. The results showed that seed treatment with bio-inoculant (*T. viridae*) @ 10 g / kg of seed in stem rot resistant variety JBO-2003H recorded significantly higher fibre yield over the other treatments under consideration. PDI showed lowest value (3.10)

in the said treatment closely followed by the treatment comprising lime application with seed treatment through bio inoculant (3.70). It was further revealed that there was no significant difference in fibre yield achieved with TO-II and TO-III, though TO-III was more remunerative as compared to TO-II (B:C ratio - 3.29 vs. 2.75). Higher cost of cultivation in TO-II was due to extra application of liming materials. It was found that introduction of stem rot resistant variety JBO-2003H as well as soil pH correction through liming could be used as an effective mechanism to combat the infestation of stem rot pathogen.

Table: Effect of various management measures of stem rot pathogen in jute

Technology options	Fibre yield (q/ha)	Plant height (cm)	Basal diameter (cm)	PDI (%)	Gross Cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
FP: No seed treatment and no soil correction	22.5	280	1.21	17.3	22200	53000	30800	2.38
TO-I: Seed treatment with carbendazim @ 0.2% + spraying of carbendazin @ 0.1% at 15 days interval with the onset of rotting pathogen	24.9	297	1.36	12.1	23300	59000	35700	2.53
TO-II: Soil pH correction through liming + seed treatment with bio-inoculant (<i>T. viridae</i>) @ 10 g / kg of seed	29.6	310	1.39	3.70	25350	69900	44550	2.75
TO-III: Introduction of stem rot resistant veriety (JBO 2003H) + seed treatment with bio-inoculant (<i>T. viridae</i>) @ 10 g / kg of seed	30.9	322	1.39	3.10	22340	73600	51260	3.29
CD (P=0.05)	1.40	15.20	NS	-	-	-	-	-

KVK DakshinDinajpur

Effect of different feeding management of Ghungroo pigs

Poor farmers of Dakshin Dinajpur district rear Ghungroo pig mainly as a means of their livelihood security. It provides profitable income to their family. However, they rear indigenous breeds without giving any scientific feed supplement during gestation period which causes poor growth & higher piglet mortality. To overcome such problem, KVK Dakshin Dinajpur had taken up a trial at 21 different locations of the district. TO-II was found to be best over FP and TO-I, as the weight gain during last month of gestation was more as well as piglet mortality was less than other practice. During 1st month of parturition the feed option II was also significantly better than farmers' practice. Weight gain has been increased substantially over farmers' practice and feed option –I through judicious preparation of LCCF with locally available resources, Dewormer and micronutrient supplementation i.e. TO-II. So, TO-II is recommended in scientific piggery management for its better performance and reduced piglets mortality.



Table: Performance of Ghungroo pigs under various feeding regimes

Technology options	Weight of gesta	gain from last tion to 1 st mon parturition (kg	t month iths after g)	Cost of rearing (Rs/	Gross return (Rs/	Net return (Rs/	B:C ratio
	Last month of Gestation	1 st month of parturition	Avg. Piglet Mortality (%)	animal/ gestation)	animal/ gestation)	animal/ gestation)	
FP: Piggery management with imbalanced concentrate feeding and no nutrient supplements	64	55	42	5360	14250	8890	2.66
TO-I: Dewormer supplements (@ 5mg/ kg body weight) to sow before gestation + composite vitamin-mineral supplements for two months, one month each before and after parturition @ 20-25 gm/day.	86	79	15	6150	25370	19220	4.13
TO-II: Dewormer supplements (@ 5mg/ kg body weight) to sow before gestation + micronutrient supplement for two months each before and after parturition + low cost concentrate feed for two months each before and after parturition	94	87	06	6730	29540	22810	4.39
SEm (±)	0.6424	0.8591	1.2182	-	-	-	-
CD (P=0.05)	1.98	2.65	3.75	-	-	-	-

KVK Hooghly

Assessment of efficacy of combination of micronutrients and growth regulators in controlling flower and fruit drop in capsicum

For addressing the problem of low productivity of capsicum in irrigated farming situation of new alluvial soil in Hooghly district due to poor fruit-set and high flower and fruit drop, a trial was conducted by KVK Hooghly at 7 different locations. It was found that TO-II [Application of tracel-2 @ 2.5g/litre before flowering + Application of Planofix (4.5% NAA) @ 1ml/ 5 litre at full bloom stage] was the best in respect of yield parameters, but recorded a non-significant decrease in B:C ratio than TO-I (1.95 vs. 2.05).

Table: Efficacy of combination of micronutrients and growth regulators to control flower and fruit drop in capsicum

Technology option	Marketable fruits/ plant	Avg. fruit Weight (g)	Yield (t/ ha)	Cost of cultivation (Rs / ha)	Gross Return (Rs / ha)	Net Return (Rs / ha)	B:C ratio
FP: Improper use of micro nutrients and no use of hormone in capsicum	6.34	93.4	18.39	2,06,250	3,34,620	1,28,370	1.62
TO-I:Application of tracel-2 @ 2.5g/litre before flowering + Application of Triacontanol @ 0.5ml/ litre at full bloom stage.	7.02	104.8	23.82	2,10,000	4,30,200	2,20,200	2.05
TO-II:Application of tracel-2 @ 2.5g/litre before flowering + Application of Planofix (4.5% NAA) @ 1ml/ 5 litre at full bloom stage.	7.54	117.8	27.66	2,10,000	4,95,900	2,85,900	1.95
TO-III:Application of tracel-2 @ 2.5g/litre before flowering + Application of NAA @ 20 ppm at first flower opening followed by two sprays at an interval of 20 days.	6.88	101.8	20.89	2,10,750	3,84,480	1,73,730	1.82
SEm+	0.215	3.000	0.687				
CD(P=0.05)	0.662	10.669	2.117				

KVK Malda

Evaluation of various plant growth regulators in production of litchi

Huge loss of production due to fruit drop in litchi has been identified as a problem in Malda district. To solve this problem, KVK Malda took up a trial at 21 different

Table: Effect of various growth regulators on litchi production

-	-					
Technology option	Yield (q/ ha)	% increase	Cost of cultivation (Rs / ha)	Gross return (Rs/ ha)	Net return (Rs/ ha)	BC ratio
FP: No use of growth regulator	80.0	-	75000	130000	55000	173
TO-I: Use of Boron @ 300 ppm + Zinc EDTA @ 1.5 gm/ lit of Water.	87.0	8.75	81500	143200	61700	1.76
TO-II: Triacontanol @0.30 ppm.	99.0	23.75	85800	154300	68500	1.80
TO-III: NAA @ 20 ppm.	121.0	51.25	93300	171000	77700	1.83

KVK Murshidabad

Assessment of various control measures of coconut mite

Low profitability from coconut due to high eriophid mite infestation in homestead land has been identified as a major problem throughout the district of Murshidabad. In order to sort out this problem, KVK Murshidabad carried out a trial at 8 different locations to see the effect of various control measures of coconut mite infestation. From the trial, it was obvious that TO-I, i.e., application of insecticide through root feeding drastically reduced the mite infested nut as well as increased nut production upto 14666 nuts/ha, compared to 8835 nut/ ha in farmers practice and a B:C ratio of 3.58 was obtained in TO-I.

locations to assess the performance of different growth regulators in production of litchi.From the trial, it can be

concluded that performance of growth regulator in the

production of litchi plays positive role. It further revealed

that TO-III, i.e., use of NAA (Napthalene Acetic Acid) @

20 ppm recorded the highest yield of 121.0 q/ha and B:C

Table: Efficacy of different chemical control measures on mite infestation, yield and economics of coconut

Technology option	Infested Nut (%)	Yield (nut/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs / ha)	B:C ratio
FP: No use of insecticide and cleaning the palm (by removing the dry, old leaf and dry bunch) once in a year	72.34	8835	20175	61845	41670	3.07
TO-I: Root feeding with Triazophos (15ml) + water (15 ml) + Carbandazim (3 gm) + Urea (2 gm)/ palm at 3 month interval. (along with recommended fertilizer dose i.e., NPKB : 750:500:1200:50g /palm / year)	23.56	14666	28650	102662	74012	3.58
TO-II: Application through bunch, i.e., Acaricidal injection into the spathe (Fenazaquin @1% at 4 months interval (Along with recommended dose of fertilizer with N:P:K:B::750:500:1200:50g/ palm/year	34.65	13725	27770	96075	68305	3.45

KVK Nadia

Effect of herbal extract on the growth performance of dairy calves

Poor growth rate in dairy calves during their early part of life may lead to less lifetime production. Thus, the growth rate in dairy calves has an important bearing on the future production potential. Poorer growth in calves may be attributed to the incidence of various endo-parasitic infestation, apart from other factors. Keeping this in view, a trial was conducted by KVK Nadia at 7 different locations to assess various doses of a herbal extract in terms of growth rate and economics of dairy calf rearing. The results revealed that TO-II performed better in terms of growth rate and B:C ratio.

Table: Efficacy of herbal extract in promoting growth rate in dairy calves

Technology option	Body weight at 6 month of age (kg)	Gross return (Rs/Unit)	Net return (Rs/Unit)	B:C ratio
FP: No use of herbal extract as growth promoter or dewormer	107.71	6000	4760	4.76
TO-I: Feeding calves with <i>Clerodendrumviscosum</i> , <i>vent</i> (Herbal extract) @ 5 ml daily x 3 days at one month interval	116.93	7000	5740	5.55
TO-II: Feeding calves with <i>Clerodendrumviscosum</i> , <i>vent</i> (Herbal extract) @ 10 ml daily x 3 days at one month interval	122.39	8000	6740	6.34



KVK North 24 Parganas

Evaluation of different lime application methods in small and medium sized ponds for improving fish productivity

Pisciculture is a common practice for the farmers of North 24 Parganas district. Poor fish productivity in domestic small and medium sized pond is due to low pH of water(pH ranges from 6.0 to 6.5). Acidic water (pH <7.0) reduces the growth of fish. Lime improves the mineralization of organic matter which acts as buffer in controlling pH of fish pond. Optimum fish production is expected when pH of fish pond ranges between 7.5 and 8.5. Low fish productivity due to improper liming by the farmers of the district has been a serious problem. Keeping this in

view, a trial was conducted by KVK North24 Parganas at 21 different locations in order to assess various lime application methods in respect of fish productivity. The results showed that TO-II, i.e., Lime application (1/2 of the total dose before stocking of fish) + rest in equal monthly instalment(total dose of lime calculated based on pH of the soil and water)showed significantly higher growth rate, yield and more cost effective as compared to TO-I. It may be concluded that better growth of fish and higher fish production and higher cost benefit are obtained through application of lime (1/2 of the total dose before stocking of fish) + rest in equal monthly installment (total dose of lime calculated based on pH of the soil and water.

 Table: Effect of various lime application methods on fish growth and economics of fish production

Technology options	Final (10 months)					Aver	Average Growth		Yield	Cost of	Gross	Net return	B:C				
	le	ngth (cr	n)	v	Veight (g)	rate (rate (g)/ month (10 months)		(q/ha)	/ha) cultivation (Rs lakh/) cultivation return (1 (Rs lakh/ lakh/ha		/ha) cultivation return (Rs (Rs lak (Rs lakh/ lakh/ha) ha)		(Rs lakh/ ha)	ratio
	С	R	Μ	С	R	Μ	С	R	Μ		ha)						
FP: Improper application of lime (100 kg/ha/ yr)	20.0	17.5	16.6	330.0	325.0	320.0	1.4	1.3	1.1	14.5	0.30	0.87	0.57	2.90			
TO-I: Lime application	36.8	34.2	32.5	410.0	390.0	380.0	2.1	1.9	1.7	24.1	0.425	1.687	1.262	3.97			
TO-II: Lime application	38.3	34.5	31.4	430.0	395.0	390.0	2.3	2.1	1.9	26.5	0.450	1.855	1.405	4.12			
SEm (±)	0.326	0.315	0.311	3.5	3.27	3.11	0.107	0.063	0.07	0.35		-	-	-			
CD (P=0.05)	0.979	0.945	0.933	10.5	9.817	9.33	0.321	0.189	0.221	1.064	-	-	-	-			

C:Catla, R:Rohu, M:Mrigal

TO-I: Lime application (single dose before stocking of fish) (total dose of lime calculated based on pHof the soil and water)

TO-II: Lime application (1/2 of the total dose before stocking of fish) + rest in equal monthly instalment (total dose of lime calculated based on pH of the soil and water)

KVK Purulia

Assessment of rainfed Maize (Zea mays) based intercropping systems with Black gram (Vigna mungo) under different spatial arrangements during Kharif season in unbunded uplands of Red laterite zone of Purulia, West Bengal

Total area of maize and black gram are 6401 ha and 2976 ha, respectively, and the average yield is 9.57 q/ha for maize and 4.44 q/ha for black gram during Kharif season.

Cultivation of both the crops in the unbunded uplands is an age-old practice with high socio-cultural acceptability. But last 5-6 years, it has been noticed that productivity of both the crops are declining considerably due to various bio-physical stresses. As a result both area under these crops and their production are showing a declining trend. Keeping this in view, a trial was carried out by KVK Purulia at 10 different locations to assess the yield and economics of intercropping system. Among intercropping

Table: Effect of rainfed maize (Zea mays) based intercropping systems with Black gram (Vignamungo)under different spatial arrangements during Kharif season

Date of sowing: 20-22/07/2014, Date of harvesting: 27-30/09/2014, No. of Replication: 10, Maize cv.Kanchan; Black gram cv. Sarada

Technology option	Yi	eld (q/ha)	MEY	Gross Cost	Gross Return	Net Return	B:C
	Maize	ze Black Gram		(Rs/ha)	(Rs/ha)	(Rs/ha)	ratio
FP: Sole crop of Maize	22.20	-	22.20	13800	26640	12840	1.93
FP: Sole crop of Black gram	-	8.52	24.85	12600	29820	17220	2.36
TO-I: Maize (50 cm) + Black gram (1:1)	20.15	4.45	33.12	14500	39755	25255	2.74
TO-II : Maize (75 cm) + Black gram (1:2)	15.20	5.85	32.26	15500	38715	23215	2.49
CD at 5%	1.52	0.72	2.74				



systems, TO-I [Maize (50cm) with Black gram in 1:1 row proportion] was proved to be the most efficient, productive and remunerative as it gave highest mean maize equivalent yield (33.12 q/ha) and also accounted for highest net return (Rs.25,255/ha) and B:C ratio compared to other systems. Thus, TO-I can be suggested as a biological and economically viable intercropping system for higher productivity and profitability under rainfed system.

KVK South 24 Parganas (Narendrapur)

Evaluation of effect of various feeding and management techniques on growth rate and yield of scampi (tiger prawn)

In some parts of South 24 Parganas district, scampi culture

is a common practice. Due to cannibalism, the number of scampi is reduced leading to heavy loss in production as well as low growth rate due to improper feeding. Therefore, a trial was conducted by KVK South 24 Parganas (Narendrapur) at 21 different locations in order to evaluate various feeding and management techniques in terms of scampi growth and yield. The scampi under TO-II [Supplementary feed (CP Feed) @ 3-5% total body weight& paddle aerator, rearing practices with stocking density 10,000- 15,000 nos. ha⁻¹] recorded significantly higher production than FP. The scampi production as well as quality of prawn was found to be better in TO-II. The highest B:C ratio was also recorded under TO-II.

Table: Effect of various feeding and management techniques on growth rate and yield ofscampi

Technology options	At 7 months age			Growth	Yield (q/	Cost of	Gross	Net	B:C
	Length (cm)	Girth (cm)	Weight (g)	day)	months	(Rs/ha)	(Rs/ha)	(Rs/ha)	1410
FP: S campi culture with feeding (groundnut oilcake : rice bran : trash fish meal :: 3:3:4) @ 3-5% total body weight, rearing practices with stocking density 10,000-15,000 nos. ha ⁻¹	200	8.5	100	1.82	14.3	43,000	71,500	44,000	2.6
TO-I:Supplementary feed (CP Feed) @ 3-5% total body weight, rearing practices with stocking density 10,000- 15,000 nos. ha ⁻¹	225	9.0	120	1.99	28.5	83,800	1,99,500	1,62,000	5.2
TO-II:Supplementary feed (CP Feed) @ 3-5% total body weight& paddle aerator, rearing practices with stocking density 10,000-15,000 nos. ha ⁻¹	230	9.5	150	2.10	28.8	90,600	2,01,600	1,64,000	5.4
SEm (±)	1.863	0.89	1.89	0.139	0.191	-	-	-	-
CD (P=0.05)	1.546	0.425	0.456	0.410	0.246	-	-	-	-

KVK South 24 Parganas (Nimpith)

Assessment of effect of various bio-formulations on yield and quality of betel leaf

Betel leaf is an important commercial crop of the South 24 Parganas district having huge export potential. The basic need of marketing a horticultural produce in the export market is that it should be free from toxic chemicals usually comes from pesticides and plant growth promoters. As the crop is consumed directly without peeling/processing, the demand for toxicity free produce is high. This trial was framed at 10 different locations with a view to produce good quality betel leaf without using chemical growth promoters.Farmers were found to be interested with this experiment. Results revealed that TO-I (Cowdung 1 kg + Glyricidia/Subabul leaf 1 kg + water 20 lt – rotting in lid covered pitcher for 3 weeks and spraying the decomposed solution @ 1:2 dilution upon the plant leaf at 10 days interval) and TO-III (Spraying of fresh milk @ 25ml/lt upon the plant at 10 days interval) showed better performance than commercial plant growth regulators (PGRs) in terms of B:C ratio and net return. The bio-based formulations (TO-I and TO-III) resulted in production of better quality leaf attributed by roundish shape (lower value of shape index) with higher weight, thickness and glossiness. Many betel vine farmers were willing to follow organic based crop management practices not only for export market but for better crop management of their own also.


Technology option		Yi	eld compo	onent		Yield	Cost of	Gross	Net	BC
	Leaf shape index (length: width)	Size (sqcm)	Leaf weight (g)	Leaf thick-ness (mm)	Glossiness of leaf (10 point scale)	(No of leaf/ha)	cultivation (Rs./ha)	return (Rs/ha)	return (Rs./ha)	ratio
FP: Commercial plant growth promoters (PGRs) having amino acids, synthetic hormones etc. @ 7-15 days interval upon full grown betel vine plantation	1.147	181.34	3.57	0.19	6	21,38,000	735000	1710400	975400	2.33
TO-I: Cow dung 1 kg + Glyricidia/ Subabul leaf 1 kg + water 20 lt – rotting in lid covered pitcher for 3 weeks and spraying the decomposed solution @ 1:2 dilution upon the plant leaf at 10 days interval	1.134	182.47	3.68	0.20	7	22,17,000	715100	1773600	1058500	2.48
TO-II: Spraying of germinated moong seed extract @ 20 g/lt upon the plant at 10 days interval	1.176	170.81	3.42	0.16	6	20,42,000	781600	1633600	852000	2.09
TO-III: Spraying of fresh milk @ 25ml/lt upon the plant at 10 days interval	1.156	178.93	3.54	0.19	7	21,55,000	733500	1724000	990500	2.35
CD (0.05)	0.026	1.92	0.11	0.02	-	-	-	-	-	-

Table: Effect of various bio-formulations on yield and quality of betel leaf

KVK Uttar Dinajpur

Assessment of effect of nutritional weaning food on child health

Lack of dietary essentials in food leading to poor health and growth of children of Uttar Dinajpur district has been identified as a serious concern. In order to solve this, KVK Uttar Dinajpur took up an on-farm trial at 8 different locations on low cost nutritional weaning foods and their impact on child health. In this trial, two types of supplementary foods were used – one was based on malted wheat and *Moringaoleifera* leaves (TO-I) and the other one was on wheat supplemented with malted buckwheat flour and peanuts. In each treatment, 8 children (of age group 6 months to 3 years) were taken and provided with supplementary food for 4 months. Approximately 75g to 150g baby food was given to each baby per day. Amount of food varied according to age group. First it was given twice a day and after 15 days food was given thrice a day in milk/water according to availability. After statistical analysis, it was revealed that the increase in weight gain was significant in all the cases as compared to farmer's practice. However, TO-II [Wheat supplemented with malted buckwheat (*Fagopyrumesculentum*) flour and peanuts (Wheat: Buckwheat: Peanut: Jaggery ::55:15:10:20)] was found to be the best.

Table: Effect of low cost weaning foods on children health

Technology Option]	Mean of Weight (in Kg	s)
	Before treatment	Intermediate (After 2 months)	After treatment
FP:Inadequate dietary pattern, low intake of iron, vitamins etc.	8.562	8.62	9.183
TO-I: Malted wheat supplemented with <i>Moringaoleifera</i> leaves. (Wheat: Moringa leaves: Jaggery:: 70:10:20)	8.383	9.803	11.575
TO-II: Wheat supplemented with malted buckwheat (<i>Fagopyrumesculentum</i>) flour and peanuts (Wheat: Buckwheat : Peanut: Jaggery ::55:15:10:20)	8.285	10.516	12.035
CD at 5%	NS	1.235	0.652

TO-II performed better than control and TO-I. It was observed that weight gain was significantly more in TO-I and II as compared to farmer's practice. Supplementary foods which were rich in essential dietary elements i.e. carbohydrates, protein and minerals etc. contributed to children's good health and significant increase in weight. The cost of treatment is less in case of TO-I (Rs. 3.50 per 100 g of food) as compared to TO-II (Rs. 5.50 per 100 g of food). The nutritive values of weaning foods were also analyzed from CFTRI, Mysore and presented below.



Table: Nutritive value of weaning foods

Sl. No.	Parameters	TO-I	TO-II
1.	Moisture, % b. wt.	5.33	3.06
2.	Total Ash, % b. wt.	1.65	1.73
3.	Protein, % b. wt.(Nx6.25)	10.7	13.8
4.	Fat, % b. wt.	0.40	4.27
5.	Crude fibre, % b. wt.	1.53	1.87
6.	Carbohydrates, % b. wt.	80.4	75.3
7.	Calorific value, Kcal/100g	321	395
8.	Calcium (mg/100 g)	37.8	24.7
9.	Sodium(mg/100 g)	135	86.1
10.	Potassium(mg/100 g)	274	307
11.	Iron (mg/100 g)	6.68	7.83

KVK West Midnapore

Assessment of different control measures of fruit borer in bitter gourd in Kharif season

Low production of bitter gourd due to heavy attack of fruit borer has been a serious problem in West Midnapore district during recent years. In order to see the effect of different measures for controlling fruit borer, a trial was conducted by KVK West Midnapore at 10 different locations. The results revealed that the performance of TO-II (Spraying of Flubendiamide 39.35 EC @ 0.3 ml/ lit of water) was better than FP and TO-I. The incidence of pest infestation under TO-II (10.51%) was lower than TO-I (14.21%) and FP (33.23%). The yield of bitter gourd under TO-II (191.68 q/ha) was higher than TO-I (170.34 q/ha) and FP (160.9 q/ ha) with a recorded B:C ratio of 1.85.

Table: Yield and incidence of fruit borer in bitter gourd under different control measures

Technology option	Yield c	omponent	Insect pest	Yield	Cost of	Gross	Net	BC
	Avg. No. of fresh fruit / Plant	% of more yield than Farmers Practice	incidence (%)	(q/ha)	cultivation (Rs/ha)	return (Rs/ha)	return (Rs/ha)	ratio
FP: Spraying of Endosulfan @ 2ml/lit of water	66.82	-	33.23	160.9	147250/-	241650/-	94400/-	1.64
TO-I:Use of poison bait (Gur 100 gm + wheat barn 200 gm + 20 ml Novaluron + 200 ml water).	88.26	14.09	14.21	170.3	155320/-	278220/-	122900/-	1.79
TO-II: Spraying of Fluben- diamide 39.35 EC @ 0.3 ml/ lit of water.	106.71	21.42	10.51	191.6	158730/-	293650/-	134920/-	1.85
SEm(±)	3.4367		2.16032	4.3584				
CD (5%)	7.66		4.81	9.71				

4.2. FRONTLINE DEMONSTRATION

Frontline demonstration was most important tool for demonstration of the latest technologies to the farming community. During 2014-15, a total of 15667

demonstrations were made in 3484 ha area in various aspect of crop production system. Analysis showed that 1831 ha was covered in the state of Bihar, 860 ha in Jharkhand, 787 ha in West Bengal and 6 ha in the Union territoty of A&N Islands. Details are given in the following table

Table: Frontline demonstration conducted during 2014-15

States	Rabi oi	lseeds	Kharif o	ilseeds	Rabi p	ulses	Kharif	pulse	Other than and pu	ı oilseed ılse	Tota	ıl
	No. of Farmers	Area (ha)	No. of Farmers	Area (ha)	No. of Farmers	Area (ha)						
Bihar	740	251.4	51	10.3	1198	313.9	290	68	4141	1188	6420	1832
Jharkhand	854	214.0	200	46.5	289	37.2	723	178	1796	385	3862	860
West Bengal	879	176.3	22	6.2	268	29.0	323	48	3881	528	5373	787
A&N Islands	5	2.0	0	0.0	0	0.0	3	1	14	3	22	6
Total	2478	643.7	273	63.0	1755	380.1	1339	294	9832	2104	15677	3485



4.2.1 Kharif oilseeds

In kharif, niger was the leading oilseed crop, followed by sesame. New initiative was taken for popularization of soybean in the state of Bihar and Jharkhand. Niger was demonstrated in 46.7 ha involving 196 farmers in Jharkhand and West Bengal. Varieties demonstrated were Birsa niger 1, Birsa niger 2 and Puja 1. Technologies demonstrated were Integrated crop management and varietal evaluation etc. Sesame was demonstrated in 10 ha involving 48 farmers in the state of Bihar. Sulfar and integrated crop management were demonstrated in sesame. Groundnut was demonstrated in 18.5 ha involving 99 farmers in the state of Jharkhand. Groundnut varieties like GG 20 and

Table: Demonstration on Kharif oilseeds

AK-12-24 were introduced by the KVKs in different districts of the state. Sulphur through phosphozypsum, biofertilizer were also demonstrated in groundnut.

Soybean, a new crop in the eastern states, was introduced by KVK in Bokaro to popularize the crop in kharif season. Birsa Soybean-1 was taken up by the KVK. Total coverage of demonstration under kharif oilseeds was 63.0 ha which covered 273 farmers. Improvement in yield was 62.4% in niger, 26.2% in soybean, 28.1% in sesame, 33.7% in groundnut which was notworthy. Economics was also in the favour of tew technologies, groundnut gave B:C ratio 2.4, niger 1.95-1.98, soybean 1.96-2.63, sesame 2.99 during *kharif* season.

Sl. No.	Сгор	State	No. of Farmers	Area (ha)	Yield	(q/ha)	% Increase	*Econ	omics of ((Rs./	demonstr ha)	ation	*E	Economia (Rs.	s of chec /ha)	k
					Demo	Check		Gross cost	Gross return	Net Return	** BCR	Gross cost	Gross return	Net Return	** BCR
1	Groundnut	Jharkhand	21	5.0	17.7	13.4	33.7	27471	65958	38486	2.40	25170	42305	25275	1.68
		Total	21	5.0	17.7	13.4	33.7	27471	65958	38486	2.40	25170	42305	25275	1.68
2	Niger	Bihar													
		Jharkhand	174	40.5	4.8	3.5	42.1	9305	18395	9095	1.98	7819	13354	5535	1.71
		West Bengal	22	6.2	5.5	3.0	82.6	12525	24400	11875	1.95	9350	13650	4300	1.46
		Total	196	46.7	5.1	3.2	62.4	10915	21398	10485	1.96	8585	13502	4918	1.57
3	Soybean	Bihar	3	0.3	12.4	9.8	26.5	19800	52100	32300	2.63	18250	35300	17050	1.93
		Jharkhand	5	1.0	11.2	8.9	25.8	14000	28000	14000	2.00	13580	24600	11020	1.81
		Total	8	1.3	11.8	9.4	26.2	16900	40050	23150	2.37	15915	29950	14035	1.88
4	Sesame	Bihar	48	10.0	4.2	3.3	28.1	12600	37685	25085	2.99	5025	10140	5115	2.02
		Total	48	10.0	4.2	3.3	28.1	12600	37685	25085	2.99	5025	10140	5115	2.02
Tota	l kharif oilsee	ed	273	63.0											

4.2.2 Rabi oilseeds

Rabi oilseeds are the major crops in the predominant rice based cropping system in eastern states. Most important of which are mustard and toria. Mustard was demonstrated in 518.6 ha and toria in 34.0 ha. Nutrient management, varietal management, aphid management, sulfar management, seed treatment etc. were demonstrated to boost up the vield of the crop. Major varieties were Pusa Bahar, Pusa Mahak, NC-1, B-54, B-9 in mustard and JE 28 in toria. Linseed is a very important crop in Bihar in rabi season. Total demonstration was made in 22.1 ha involving 70 farmers with major variety like Garima. Technologies like nutrient management, IPM etc. were also demonstrated. Summer sesame is also grown as crop rotation in the eastern states that covered 38.5 ha involving 187 farmers. Major varieties were SWB-32-10-1, Tarun etc. The new varieties replaced old varieties and accepted by the farmers. Nutrient management, varietal replacement were the main objectives of these demonstrations.

Groundnut in rabi summer season is gaining ground in Bihar and Jharkhand. TG-51, TG-22, SG-99 introduced by the KVKs in their respective districts gave a thrust to this crop.

Sunflower is yet to expand in this zone. An initiative was taken to take this crop at large scale though there are some constraints in popularizing the crop. Sunflower hybrid KBSH-1 was demonstrated with full package and with component of technologies. The crop was demonstrated in 10 ha in the state of West Bengal. New initiative are being taken up to spread the crop in the other states also.

A total of 641.7 ha was brought under demonstration in rabi oilseeds and 2473 farmers were involved in this programme. Yield increase was in the tune of 33.7% in



mustard, 103.9% in toria, 31.6% in sunflower, 45.5% in linseed, 32.7% in sesame, 42.9% in groundnut.

Economics of the demonstration also showed improvement in profitability through introduction of technologies. B:C ratio were 2.21 to 2.48 in mustard, 2.25-2.58 in toria, 2.0 in sunflower, 1.19-2.22 in linseed, sesame 1.61 to 2.71. groundnut 2.26 to 2.89 in rabi sesame.



Demonstration in sesame and groundnut

Table: Demonstration on Rabi oilseeds

Sl. No.	Сгор	State	No. of Farmers	Area (ha)	Yield	(q/ha)	% Increase	*Econo	mics of d (Rs./l	emonstra 1a)	tion	*E	conomic (Rs.	cs of cheo /ha)	:k
					Demo	Check		Gross cost	Gross return	Net Return	** BCR	Gross cost	Gross return	Net Return	** BCR
Rabi	oilseeds														
1	Mustard	Bihar	532	188.3	11.7	8.9	31.9	15187	37617	22469	2.48	13959	27983	15005	2.00
		Jharkhand	727	187.0	10.4	7.6	41.0	16106	36939	20832	2.29	13951	26172	15350	1.88
		West Bengal	732	143.3	11.0	8.8	28.1	14957	33064	18234	2.21	16730	32318	15595	1.93
		Total	1991	518.6	11.1	8.5	33.7	15417	35873	20512	2.33	14880	28824	15317	1.94
2	Toria	Bihar	99	30.0	10.0	7.4	37.6	11523	29693	18170	2.58	10334	21630	11296	2.09
		Jharkhand	12	4.0	12.0	4.5	170.1	18500	41664	23164	2.25	17000	24240	7240	1.43
		Total	111	34.0	11.0	5.9	103.9	15012	35679	20667	2.38	13667	22935	9268	1.68
3	Sunflower	West Bengal	15	10.0	25.0	19.0	31.6	25000	50000	25000	2.00	25000	35000	15000	1.40
		Total	15	10.0	25.0	19.0	31.6	25000	50000	25000	2.00	25000	35000	15000	1.40
4	Linseed	Bihar	50	16.1	9.3	7.1	30.6	12491	27748	15257	2.22	11278	21099	9821	1.87
		Jharkhand	20	6.0	7.7	4.8	60.4	12100	14400	2300	1.19	9300	10400	1100	1.12
		Total	70	22.1	8.5	6.0	45.5	12296	21074	8778	1.71	10289	15749	5461	1.53
5	Sesame	Bihar	59	17.0	4.3	3.1	35.6	10238	27738	17500	2.71	9061	20450	11389	2.26
		Jharkhand	39	10.0	3.7	2.6	42.3	10880	17500	6620	1.61	9475	12000	2525	1.27
		West Bengal	89	11.5	11.1	9.2	20.2	15523	37210	21688	2.40	14878	31030	16153	2.09
		Total	187	38.5	6.3	5.0	32.7	12213	27483	15269	2.25	11138	21160	10022	1.90
6	Groundnut	Jharkhand	56	7.0	15.6	9.7	60.7	25000	72233	46100	2.89	22850	44660	21810	1.95
		West Bengal	43	11.5	28.5	23.2	25.2	42593	96273	53680	2.26	36307	72697	43057	2.00
		A&N Islands	5	2	21.4	17.8	20.2	31400	85600	54200	2.72	28700	71200	42500	2.48
		Total	104	20.5	21.8	16.9	35.4	32998	84702	51327	2.63	29286	62852	35789	2.15
	Total rabi	oilseed	2478	643.7											

4.2.3 Kharif pulse

Redgram is major pulse crop in kharif season. Apart from redgram, blackgram, greengram, horsegram are important pulse crops in the eastern states. Redgram, varieties Narendra Arhar – 2, P2002 NTL-2 Malviya 13 IPCCL 85063, Birsa Arhar-1 were demonstrated in this year. Major technologies demonstrated were IPM, nutrient management, varietal replacement etc. Total coverage under redgram demonstration was 206.3 ha involving 894 farmers. Bihar alone demonstrated the crop in 56.2 ha, in Jharkhand the crop got prime importance which was covered in 139.6 ha involving 564 farmers. The second important pulse crop in kharif season was blackgram which got coverage in 51.6 ha and covered 289 farmers. KU 99-3, Birsa urd-1, Uttra varieties of blackgram were demonstrated with technology packages like IPM, nutrient management etc. Green gram was demonstrated in 25.6 ha involving 128 farmers. Main varieties under



demonstration were SML-668, Pusa Ratna. Horsegram is also an important pulse crop in the state of Jharkhand which got coverage in 10 ha during the year. The total coverage was 293 ha involving 1336 farmers in kharif season. Yield increase was 48.8% in redgram, 35.8% in blackgram, 44.1% in greengram, 120% in horsegram. Kharif pulse gave the B:C ratio of 1.61 to 2.78, blackgram 1.61 to 1.98, greengram 1.68 to 2.78 and horsegram 2.48%.

Table:	Demonstration	on	Kharif	pulses
--------	---------------	----	--------	--------

Sl. No.	Сгор	State	No. of Farmers	Area (ha)	Yield	(q/ha)	% Increase	*Econo	omics of (Rs.	demonst /ha)	ration	*E0	conomic (Rs./	s of che /ha)	ck
					Demo	Check		Gross cost	Gross return	Net Return	** BCR	Gross cost	Gross return	Net Return	** BCR
1	Redgram	Bihar	257	56.2	15.2	10.9	41.8	20401	62790	42340	3.08	18591	45926	27464	2.47
		Jharkhand	584	139.6	14.4	10.0	48.8	16742	53838	37101	3.22	14554	37964	23527	2.61
		West Bengal	53	10.5	12.3	8.3	55.1	23575	58775	35200	2.49	18168	38610	20468	2.13
		Total	894	206.3	14.0	9.7	48.6	20239	58468	38214	2.89	17104	40833	23819	2.39
2	Blackgram	Bihar	5	1.5	7.6	6.1	24.6	11110	22800	11690	2.05	10100	18300	8200	1.81
		Jharkhand	80	21.5	9.5	7.0	34.8	14463	33638	19342	2.33	14243	24930	10686	1.75
		West Bengal	204	28.6	10.1	7.6	35.8	20490	48300	27790	2.36	19014	37562	18521	1.98
		A&N Islands	3	1.0	6.7	5.4	24.8	11750	23590	11840	2	11750	18900	7150	1.61
		Total	292	52.6	8.5	6.5	30.0	14453	32082	17665	2.22	13777	24923	11139	1.81
3	Greengram	Bihar	28	10.0	10.9	8.3	31.3	12240	42389	30149	3.46	11615	32235	21370	2.78
		Jharkhand	34	6.5	11.0	7.9	39.0	17700	57720	40020	3.26	15600	41450	25850	2.66
		West Bengal	66	9.1	10.8	8.0	44.1	22217	42733	20517	1.92	18650	31283	12633	1.68
		Total	128	25.6	10.9	8.1	38.1	17386	47614	30228	2.74	15288	34989	19951	2.29
4	Horsegram														
		Jharkhand	25	10.0	8.8	4.0	120.0	4000	12050	8050	3.01	2500	6200	3700	2.48
		Total	25	10.0	8.8	4.0	120.0	4000	12050	8050	3.01	2500	6200	3700	2.48
	Total kharif	pulse	1339	294											

4.2.4 Rabi pulse

Major pulses in the eastern states are grown in rabi season. Major crops are lentil, chickpea, greengram and pea. Lentil is grown mainly in the state of Bihar which has covered 195.8 ha and 640 farmers were involved. In West Bengal and Jharkhand, altogether 12.0 ha was put under demonstration for 95 farmers. HUL 57, DPL 62, WBL 81 were the major varieties of lentil under demonstration. Integrated pest management, variety, seed treatment bio-fertilizers were the main component of these demonstrations.

Chickpea is also a major crop in rabi season particulalry in Bihar and Jharkhand. Altogether 84.9 ha area was covered under demonstration covering 355 farmers in 3 states. The crop was demonstrated in 62.9 ha in Bihar alone. Varieties demonstrated were KAK-2, JG-14, P-256 etc. Demonstration in IPM alone contributed 13.6 % increase in yield. Green gram, a pulse crop is picking up in the state of West Bengal, Bihar and Jharkhand. It acts as green manure crop as well as pulse crop which fits in the cropping system. Altogether 577 demonstrations were made in 72.7 ha to show the merit of the crop in the district. PDM-84-139, Pusa Vishal and Samrat were the major varieties





which were demonstrated in these states. Technologies integrated were nutrient management, IPM, bio-fertilizers seed treatment etc. as the part of the demonstration. Pea is also an important crop in rabi season which is grown in all the three states. Total coverage in this season was 57.6 ha involving 88 farmers.

In rabi season coverage of pulse crop was 380.1 ha involving 1755 farmers. Yield improvement was 34.8% in lentil, 35.8% in chickpea, 42.6% in greengram, 21.8% in pea as compared to earlier used local technologies. Economics of rabi pulse showed that lentil gave 2.09-2.57, chickpea 1.2-2.47, greengram 1.55-2.37, pea 2.33-2.77 BCR in rabi pulses.

Table: Demonstration on rabi pulses

Sl. No.	Сгор	State	No. of Farmers	Area (ha)	Yield	(q/ha)	% Increase	*Econo	mics of a (Rs./)	lemonstı ha)	ration	*Есоі	nomics o ha	f check a)	(Rs./
					Demo	Check		Gross cost	Gross return	Net Return	** BCR	Gross cost	Gross return	Net Return	** BCR
1	Lentil	Bihar	640	195.8	13.5	10.3	32.9	18556	54914	37214	2.96	17244	40526	24176	2.35
		Jharkhand	6	2.0	17.3	12.0	43.8	17000	48300	31300	2.84	16200	41670	17400	2.57
		West Bengal	89	10.0	11.6	9.2	27.7	18188	46695	28508	2.57	17638	36868	19230	2.09
		Total	735	207.8	14.1	10.5	34.8	17915	49970	32341	2.79	17027	39688	20269	2.33
2	Chickpea	Bihar	213	62.9	15.7	12.9	22.5	19948	56579	35632	2.84	18657	46142	27485	2.47
		Jharkhand	104	17.0	12.3	9.3	34.9	23944	56350	29676	2.35	22010	32809	9841	1.49
		West Bengal	38	5.0	30.0	20.0	50.0	60000	90000	30000	1.50	50000	60000	10000	1.20
		Total	355	84.9	19.4	14.1	35.8	34630	67643	31769	1.95	30222	46317	15775	1.53
3	Greengram	Bihar	294	47.5	5.9	4.6	27.4	14358	27792	13434	1.94	13040	20174	7134	1.55
		Jharkhand	172	13.2	15.6	9.1	71.4	19745	52950	36205	2.68	16438	38940	22503	2.37
		West Bengal	111	12.0	11.2	8.7	28.8	22105	55847	33742	2.53	21633	43547	18372	2.01
		Total	577	72.7	10.9	7.5	42.6	18736	45530	27794	2.43	17037	34220	16003	2.01
4	Pea	Bihar	51	7.8	51.1	38.8	31.5	127761	98120	67232	0.77	25488	59450	34081	2.33
		Jharkhand	7	5.0	65.4	58.7	11.4	42862	130800	87938	3.05	42457	117400	74943	2.77
		West Bengal	30	2.0	56.2	45.9	22.4	30750	89856	59106	2.92	28250	68835	40585	2.44
		Total	88	14.8	57.6	47.8	21.8	67124	106259	71425	1.58	32065	81895	49870	2.55
		Total rabi pulse	1755	380.1											

4.2.5 Other crops

Paddy is the main crop of Bihar, Jharkhand and West Bengal. Therefore demonstration on paddy was taken up at large scale in these states. A total of 1178 ha was covered under paddy crop during 2014-15 and 3889 farmers were benefited from these demonstrations. Average yield of paddy in the demonstrations was 39.5 q/ha in Bihar, 40.59 q/ha in Jharkhand and 61.79 q/ha in West Bengal, which indicated a yield increase of 24.2%, 36.1% and 20.3%, respectively in these states. Benefit cost ratios were 1.88, 1.77 and 1.30, respectively, in these states in paddy production system. Demonstrations were made in different aspects of crop production. Like varieties, seed, bio-fertilizer, RCT, weed management, integrated crop management, integrated management, SRI etc. Varieties involved in the demonstration were Sahbhagi, Gotra Bidhan-1, SabourArdhajal, Swarna Sub-1, DRRH-2, PNR-38, MKR-47 etc.

Wheat is an important cereal in the eastern states, particularly Bihar and Jharkhand. Total 202 ha was covered under wheat demonstrations involving 710 farmers. In Bihar demonstration was in 170.1 ha, in Jharkhand it was 10.6 ha and in West Bengal 21.3 ha. Improvement in yield was 24-28% in these state through various technologies like, weed management, bio-fertilizers, integrated disease management etc. Varieties like WR 544, HD 1985, K 9107, HUW 234,H11563, HD2733, PBW 502 were demonstrated during the year. This has resulted in introduction of new HYVS suitable for different agro climatic situations of the states.

Maize is important crop in the state of Bihar and Jharkhand, now increasing its base in the state of West



Bengal, particularly in the districts of Purulia, Bankura and West Midnapore. The maize as grain crop was demonstrated in 70.35 ha involving 328 farmers. It was demonstrated in 159.9 ha involving 878 farmers as fodder or crop production. Shaktiman 1, HQPM-1, DHM 117, Shaktiman 5 were the part of the demonstration in maize. Improvement in maize yield was upto 50%.

Demonstration on Jute was made in 75.5 ha (27.8 ha in Bihar, 47.7 ha in West Bengal). The crop is very specific to the state of Bihar and West Bengal. Jute varieties like JRO 204, Co-58, were introduced in the demonstration.

Demonstration was taken up in various vegetable crops like tomato, brinjal, cauliflower, onion and potato in 120.9

ha covering 1089 farmers. Varieties like Arka sourav, Kashi Vishesh, Arka Prava, in cauliflower, Suksagar, red in onion were demonstrated. Over all demonstration in crops other than oilseeds and pulses were in 2100.3 ha involving 9818 farmers during the year 2014-15.



Demonstration on rice and wheat

Sl. No.	Сгор	State	No. of Farmers	Area (ha)	Yield	(q/ha)	% Increase	*Econo	omics of ((Rs./	demonstı 'ha)	ration	*Econo	omics of	check (R	s./ha)
					Demo	Check		Gross cost	Gross return	Net Return	** BCR	Gross cost	Gross return	Net Return	** BCR
1	Paddy	Bihar	1914	764.7	39.5	32.6	24.2	25205	56249	30976	2.23	23916	45024	20856	1.88
		Jharkhand	869	218.1	40.5	30.4	36.1	25815	59992	34921	2.32	23164	41077	17604	1.77
		West Bengal	1103	194.3	61.7	52.0	20.3	74794	111491	36165	1.49	74951	97646	22886	1.30
		A&N Islands	3	1.00	49	38	29	26850	48500	21650	1.81	26850	37600	10750	1.40
		Total	3889	1178.0	47.5	38.2	27.4	38166	69058	30928	1.81	37220	55336	18024	1.49
2	Wheat	Bihar	496	170.1	34.5	28.0	24.3	25172	54051	28879	2.15	23625	43683	20161	1.85
		Jharkhand	65	10.6	33.8	26.3	28.0	27119	52761	25642	1.95	24623	40912	16290	1.66
		West Bengal	149	21.3	32.2	27.6	16.8	24524	44988	20464	1.83	24363	38662	14299	1.59
		Total	710	202.0	33.5	27.3	23.0	25605	50600	24995	1.98	24203	41086	16917	1.70
3	Maize	Bihar	54	11.1	41.5	33.5	26.4	18963	35554	19091	1.87	17723	31891	14168	1.80
		Jharkhand	150	33.9	64.0	49.6	35.7	24090	67481	58091	2.80	17499	46710	29211	2.67
		West Bengal	50	7.7	38.9	27.1	41.6	23169	42627	19457	1.84	19090	29430	10340	1.54
		Total	254	52.6	48.1	36.7	34.6	22074	48554	32213	2.20	18104	36010	17906	1.99
4	Maize fodder	Bihar	99	9.5	350.9	264.3	42.0	39686	111031	71345	2.80	35834	175678	43415	4.90
		Jharkhand	106	20.4	193.0	137.8	32.0	20500	52313	31813	2.55	19050	39983	20933	2.10
		West Bengal	777	150.0	120.0	80.0	50.0	40000	90000	50000	2.25	25000	45000	20000	1.80
		Total	982	179.9	221.3	160.7	41.3	33395	84448	51053	2.53	26628	86887	28116	3.26
5	Brinjal	Bihar	265	32.5	242.2	203.7	20.7	67243	226449	129707	3.37	63337	180663	117306	2.85
		Jharkhand	40	12.0	256.3	197.5	28.4	66688	511063	444375	7.66	61000	227250	166250	3.73
		West Bengal	73	5.5	260.4	222.8	16.7	66495	185100	95431	2.78	66784	152010	85226	2.28
		Total	378	50.0	253.0	208.0	22.0	66808	307537	223171	4.60	63707	186641	122927	2.93
6	Cotton	Bihar	97	27.8	26.9	20.4	32.6	25138	55665	30528	2.21	24819	41955	17136	1.69
		Jharkhand													

Table : Demonstration in other crops

(183L	-118
XD	ee XI
- 108	- U -
16	AR

Sl. No.	Crop	State	No. of Farmers	Area (ha)	Yield	(q/ha)	% Increase	*Econo	omics of ((Rs./	demonstı 'ha)	ration	*Econo	omics of	check (R	s./ha)
					Demo	Check		Gross cost	Gross return	Net Return	** BCR	Gross cost	Gross return	Net Return	** BCR
		West Bengal	312	47.7	30.1	26.5	14.5	119189	171669	58833	1.44	118679	153347	38590	1.29
		Total	409	75.5	28.5	23.5	23.6	72163	113667	44680	1.58	71749	97651	27863	1.36
7	Tomato	Bihar	128	12.8	299.1	200.2	69.4	58406	273383	214978	4.68	49413	177063	127651	3.58
		Jharkhand	40	2.1	368.8	253.3	45.8	82625	308750	226125	3.74	67000	202250	135250	3.02
		West Bengal	63	5.4	408.1	321.0	27.4	107300	251017	143717	2.34	121033	202217	97850	1.67
		Total	231	20.3	358.7	258.1	47.5	82777	277717	194940	3.36	79149	193843	120250	2.45
8	Potato	Bihar	35	3.5	312.3	279.8	13.4	108467	320833	245533	2.96	101333	279583	178250	2.76
		Jharkhand	82	10.0	159.3	113.8	41.8	58180	156585	98405	2.69	50155	115330	65175	2.30
		West Bengal	48	8.1	290.2	243.3	19.8	109987	168533	58546	1.53	101550	136733	35183	1.35
		Total	165	21.6	253.9	212.3	25.0	92211	215317	134161	2.34	84346	177216	92869	2.10
9	Cauliflower	Bihar	138	13.3	179.0	136.3	36.3	78050	250703	172653	3.21	72000	183525	111525	2.55
		Jharkhand	60	7.3	265.1	212.8	24.9	101300	361567	260267	3.57	108623	276933	168310	2.55
		West Bengal	31	1.2	197.5	132.9	58.1	151156	440832	289676	2.92	97332	226950	129618	2.33
		Total	229	21.8	213.9	160.7	39.8	110169	351034	240865	3.19	92652	229136	136484	2.47
10	Onion	Bihar	14	1.5	309.2	243.9	27.9	54495	325160	270665	5.97	52356	272470	220114	5.20
		West Bengal	72	6.2	154.5	110.8	35.6	183335	401063	217728	2.19	222458	399417	176958	1.80
		Total	86	7.7	231.9	177.3	31.7	118915	363111	244196	3.05	137407	335943	198536	2.44
11	Elephant footyam	Bihar	93	9.7	408.9	341.0	23.7	213331	408950	315609	1.92	204804	493521	288717	2.41
		Jharkhand	25	0.5	220.0	170.0	29.4	38600	67000	28400	1.74	38600	55200	16600	1.43
		West Bengal	55	0.7	616.6	372.0	90.5	301855	867825	565970	2.87	221425	490450	649725	2.21
		A&N Islands	8	2	320	265	21	100000	320000	220000	3	100000	265000	165000	2.65
		Total	181	12.9	391.4	287.0	41.1	163446	415944	282495	2.43	141207	326043	280010	2.18
12	Turmeric	Bihar	137	4.1	358.8	288.3	33.3	141140	383750	242610	2.72	121670	299500	177830	2.46
		Jharkhand	30	2.6	197.2	136.7	46.3	141300	745075	603775	5.27	112900	474700	361800	4.20
		West Bengal	78	3.4	160.2	119.9	33.5	110310	222100	111790	2.01	112113	163875	51763	1.46
		Total	245	10.1	238.7	181.6	37.7	130917	450308	319392	3.44	115561	312692	197131	2.71
13	Others	Bihar	671	128.0	207.0	135.1	61.3	54616	175290	124257	3.21	47529	127391	81394	2.68
		Jharkhand	329	67.3	226.0	163.6	258.6	46544	167335	125688	3.60	41616	129968	79684	3.12
		West Bengal	1070	76.1	205.2	167.7	31.6	122904	298341	156524	2.43	113696	167357	83690	1.47
		A&N Islands	3	0	46	36	28	95000	276000	181000	3	90000	216000	126000	2.40
		Total	2073	271.4	171.0	125.6	94.8	79766	229242	146867	3.03	73210	160179	92692	2.42
		Total other than FLD	9832	2103.8											



4.3 TRAINING ACHIEVEMENTS

Continuous up gradation of knowledge and skill of farmers, rural youths and extension functionaries remained as one of the focal areas of KVK activities during last one year. The farmers and farm-women registered their names in large number to acquire improved knowledge and skill in different areas of crop production, soil management, livestock production, plant protection, farm mechanization, fish production, women empowerment, production of inputs, capacity building and many more. Rural youths, on the other hand, enrolled their name to obtain training in more specific areas which are considered to have potentiality for enterprise development in the respective districts. In respect of extension functionarries, the assessment of training need by the concerned departments/organizations put them at the disposal of KVKs to refresh their field knowledge mainly in the areas of frontier technology gneration and application.

In imparting training to farmers, rural youths and extension functionarries, the KVKs resorted to on campus and offcampus locations as per the requirement of training course curriculum. As the farmers need field application of newly generated technologies/practices, emphasis was given by the KVKs to conduct more number of off-campus programmes whereas for rural youths and extension functionaries, KVKs concentrated on providing more number of on-campus training programmes.

A close look into the training programmes organized by the KVKs during 2014-15 indicates that altogether 68690 number of farmers attended 2631 number of courses organized at KVK campus and 158973 number of farmers participated in 5217 number of courses conducted outside KVK premises. In the contrary, 32583 rural youths were provided training through 1508 training programmes conducted at KVKs and only 15708 youths were the participants of 584 number of training programmes organized outside KVKs. The same trend continued for extension functionaries also and only 299 off-campus courses were conducted for 10540 participants against 482 courses and 15072 participants in respect of on-campus programmes, respectively. The cummulative figures of training programme for these categories of trainee indicate that 227663 farmers, 48291 rural youths and 25612 extension functionaries could be benefitted through 7848, 2092 and 781 number of training programmes organized during the mentioned period are provided in the following table.

Table: Training conducted for farmers and farm women

State	No. of				No. of	Participa	nts				G	rand Tot	al
	Courses		Other			SC			ST				
		М	F	Т	Μ	F	Т	М	F	Т	Μ	F	Т
A & N Island	44	244	290	534	0	0	0	469	320	789	713	610	1323
BIHAR	4578	85269	17335	102604	14775	7230	22005	2881	1658	4539	102925	26223	129148
JHARKHAND	1691	14071	5007	19078	3756	1961	5717	17309	8701	26010	35136	15669	50805
WEST BENGAL	1535	17333	4673	22006	12757	4151	16908	5209	2264	7473	35299	11088	46387
TOTAL	7848	116917	27305	144222	31288	13342	44630	25868	12943	38811	174073	53590	227663

Table: Training conducted for rural youths

State	No. of				No. o	f Particip	ants				G	rand Tota	al
	Courses		Other			SC			ST				
		Μ	F	Т	Μ	F	Т	Μ	F	Т	Μ	F	Т
A & N ISLANDS	21	125	174	299	0	0	0	104	90	194	229	264	493
BIHAR	1208	15028	6210	21238	2751	2376	5127	579	352	931	18358	8938	27296
JHARKHAND	507	2395	1320	3715	573	463	1036	3939	2480	6419	6907	4263	11170
WEST BENGAL	356	3264	1225	4489	2364	747	3111	1113	619	1732	6741	2591	9332
TOTAL	2092	20812	8929	29741	5688	3586	9274	5735	3541	9276	32235	16056	48291

Table: Training conducted for extension functionaries

State	No. of				No. of I	Participa	nts				0	Grand Tota	ıl
	Courses		Other			SC			ST				
		М	F	Т	Μ	F	Т	Μ	F	Т	Μ	F	Т
A & N ISLAND S	4	23	56	79	0	0	0	0	0	0	23	56	79
BIHAR	474	11160	1626	12786	1472	537	2009	67	30	97	12699	2193	14892
JHARKHAND	189	2654	305	2959	1234	299	1533	2498	487	2985	6386	1091	7477
WEST BENGAL	114	1301	449	1750	736	227	963	254	197	451	2291	873	3164
TOTAL	781	15138	2436	17574	3442	1063	4505	2819	714	3533	21399	4213	25612



Ground-wise trend of participation in the entire zone in respect of training organized for farmers protrays that nearly twenty four per cent (23.54%) women constituted the total participants with highest percentage recorded in A&N Islands (56.1%). In Bihar, 20.3 per cent of the total participants was women, in Jharkhand the percentage was 30.8 and it was 23.9 per cent in the case of West Bengal.

Participation of girls in the training programmes organized for rural youths, however, depicts much healthier percentage where more than 33 per cent (33.24%) of the participants was girls. State/Union Territory-wise analysis of the participation of 53.5 percent girls in the training c ourses. In respect of Bihar, the participation of girls was to the extent of 33.7 per cent, in Jharkhand it was 38.2 per cent and it was 27.8 per cent in the case of West Bengal .

In respect of extension functionaries, only 16.4 per cent women contributed the total participants in the zone though it was as high as 70.9 per cent in the case of A&N Islands. In Bihar, only 14.7 per cent of the total participants was women followed by 14.6 per cent in Jharkhand and 27.6 per cent in West Bengal .

Detailed analysis of category-wise training programmes organized by the KVKs of Zone-II indicates that out of total 7848 programmes, 1848 courses were conducted in crop production related areas, 1111 in horticulture, 1163 in plant protection, 879 in livestock production and mangement, 683 in soil health and fertility mangement, 863 in home science and women empowerment, 468 in agricultural engineering, 242 in fisheries, 162 in production of inputs, 297 in capacity building and group dynamics, 100 in agro-forestry and 32 in other areas. In respect of participation by the farmers, 55063 farmers and farm-women took part in crop production related training programmes, 35738 in plant protection related thematic areas; 30692 in horticulture including vegetable, fruit, ornamental plants, plantation crops, tuber crops, spices and medicinal and aromatic plants; 19366 in soil health and fertility management, 24427 in livestock production and mangement; 23463 in home science; 13631 in agricultural engineering; 8988 in fisheries; 8669 in capacity building; 2426 in agro-forestry and 810 in other areas.

-	No. of Courses				No. 0	of Partic	ipants				Gr	and To	tal
			Other			SC			ST				
		Μ	F	Т	Μ	F	Т	М	F	Т	М	F	Т
I. Crop Production													
Weed Management	190	3299	457	3756	892	281	1173	326	84	410	4517	822	5339
Resource Conservation Technologies	185	3720	324	4044	938	172	1110	604	186	790	5262	682	5944
Cropping Systems	91	1629	181	1810	289	81	370	376	164	540	2294	426	2720
Crop Diversification	79	1331	165	1496	498	85	583	308	115	423	2137	365	2502
Integrated Farming	89	1062	236	1298	571	114	685	518	153	671	2151	503	2654
Water management	67	1359	81	1440	213	21	234	334	74	408	1906	176	2082
Seed production	262	5009	341	5350	1093	239	1332	603	207	810	6705	787	7492
Nursery management	99	1303	233	1536	461	150	611	353	67	420	2117	450	2567
Integrated Crop Management	406	6926	664	7590	1643	376	2019	1664	366	2030	10233	1406	11639
Fodder production	54	1101	164	1265	199	45	244	98	35	133	1398	244	1642
Production of organic inputs	68	1074	298	1372	232	60	292	207	89	296	1513	447	1960
Others, (cultivation of crops)	258	4305	660	4965	1147	435	1582	1266	709	1975	6718	1804	8522
TOTAL	1848	32118	3804	35922	8176	2059	10235	6657	2249	8906	46951	8112	55063
II. Horticulture													
a) Vegetable Crops													
Production of low volume and high value crops	67	1011	144	1155	320	25	345	213	133	346	1544	302	1846

Table : Training programme for farmers and farm women



-	No. of Courses				No. o	of Partic	ipants				Gi	and To	tal
			Other			SC			ST				
		Μ	F	Т	Μ	F	Т	Μ	F	Т	Μ	F	Т
Off-season vegetables	80	968	168	1136	299	51	350	404	132	536	1671	351	2022
Nursery raising	114	1516	325	1841	544	138	682	457	97	554	2517	560	3077
Exotic vegetables like Broccoli	3	34	1	35	7	0	7	5	0	5	46	1	47
Export potential vegetables	10	194	7	201	23	4	27	22	0	22	239	11	250
Grading and standardization	2	29	0	29	9	5	14	12	7	19	50	12	62
Protective cultivation (Green Houses, Shade Net etc.)	34	488	165	653	207	49	256	114	28	142	809	242	1051
Others, if any (Cultivation of Vegetable)	372	5275	1186	6461	1562	421	1983	1218	964	2182	8055	2571	10626
TOTAL	682	9515	1996	11511	2971	693	3664	2445	1361	3806	14931	4050	18981
b) Fruits													
Training and Pruning	5	74	9	83	25	2	27	8	4	12	107	15	122
Layout and Management of Orchards	69	1228	159	1387	221	45	266	165	73	238	1614	277	1891
Cultivation of Fruit	60	1050	141	1191	346	40	386	119	50	169	1515	231	1746
Management of young plants/orchards	44	606	47	653	161	12	173	140	47	187	907	106	1013
Rejuvenation of old orchards	23	338	70	408	55	14	69	69	15	84	462	99	561
Export potential fruits	3	77	0	77	7	0	7	0	0	0	84	0	84
Micro irrigation systems of orchards	9	159	38	197	25	4	29	8	2	10	192	44	236
Plant propagation techniques	28	397	31	428	97	25	122	91	15	106	585	71	656
Others, if any	10	206	20	226	62	6	68	3	0	3	271	26	297
TOTAL	251	4135	515	4650	999	148	1147	603	206	809	5737	869	6606
c) Ornamental Plants													
Nursery Management	15	135	63	198	72	36	108	100	47	147	307	146	453
Management of potted plants	7	0	33	33	0	0	0	65	47	112	65	80	145
Export potential of ornamental plants	1	0	0	0	0	0	0	14	22	36	14	22	36
Propagation techniques of Ornamental Plants	4	32	39	71	1	0	1	1	4	5	34	43	77
Others, if any	12	170	21	191	41	19	60	41	20	61	252	60	312
TOTAL	39	337	156	493	114	55	169	221	140	361	672	351	1023
d) Plantation crops													
Production and Management technology	21	242	33	275	181	40	221	80	24	104	503	97	600
Processing and value addition	3	34	9	43	16	6	22	10	3	13	60	18	78

-	No. of Courses				No. o	of Partic	cipants				G	rand To	tal
			Other			SC			ST				
		Μ	F	Т	Μ	F	Т	М	F	Т	М	F	Т
Others, if any	5	40	4	44	68	13	81	31	15	46	139	32	171
TOTAL	29	316	46	362	265	59	324	121	42	163	702	147	849
e) Tuber crops													
Production and Management technology	41	465	54	519	71	16	87	439	232	671	975	302	1277
Processing and value addition	3	16	1	17	6	4	10	71	45	116	93	50	143
Others, if any	7	74	6	80	8	0	8	84	33	117	166	39	205
TOTAL	51	555	61	616	85	20	105	594	310	904	1234	391	1625
f) Spices													
Production and Management technology	28	314	52	366	167	33	200	160	36	196	641	121	762
Processing and value addition	2	8	0	8	6	6	12	13	22	35	27	28	55
TOTAL	30	322	52	374	173	39	212	173	58	231	668	149	817
g) Medicinal and Aroma	tic Plants												
Nursery management	3	25	46	71	12	2	14	2	0	2	39	48	87
Production and management technology	22	352	57	409	65	18	83	66	25	91	483	100	583
Post harvest technology and value addition	3	39	34	73	7	3	10	2	0	2	48	37	85
Others, if any	1	17	0	17	9	0	9	10	0	10	36	0	36
TOTAL	29	433	137	570	93	23	116	80	25	105	606	185	791
III. Soil Health and Fert	ility Manag	gement											
Soil fertility management	121	1577	203	1780	388	69	457	630	207	837	2595	479	3074
Soil and Water Conservation	47	624	51	675	168	31	199	245	59	304	1037	141	1178
Integrated Nutrient Management	211	4410	437	4847	841	237	1078	511	144	655	5762	818	6580
Production and use of organic inputs	61	714	137	851	200	38	238	289	156	445	1203	331	1534
Management of Problematic soils	27	249	71	320	77	49	126	128	64	192	454	184	638
Micro nutrient deficiency in crops	48	717	114	831	173	33	206	171	91	262	1061	238	1299
Nutrient Use Efficiency	17	124	41	165	42	26	68	141	86	227	307	153	460
Soil and Water Testing	120	1898	336	2234	474	211	685	634	192	826	3006	739	3745
Others, if any	31	282	59	341	176	21	197	229	91	320	687	171	858
TOTAL	683	10595	1449	12044	2539	715	3254	2978	1090	4068	16112	3254	19366
IV. Livestock Production	and Mana	gement											
Dairy Management	164	2698	481	3179	532	268	800	347	179	526	3577	928	4505

-



-	No. of Courses				No. o	of Partic	ipants				G	rand To	tal
			Other			SC			ST				
		Μ	F	Т	Μ	F	Т	Μ	F	Т	Μ	F	Т
Poultry Management	106	927	381	1308	359	393	752	641	309	950	1927	1083	3010
Piggery Management	60	240	113	353	254	117	371	622	295	917	1116	525	1641
Rabbit Management	1	4	0	4	0	20	20	0	0	0	4	20	24
Disease Management	216	2993	780	3773	719	359	1078	752	431	1183	4464	1570	6034
Feed management	135	1989	381	2370	502	195	697	255	176	431	2746	752	3498
Production of quality animal products	24	308	54	362	47	75	122	130	67	197	485	196	681
Others, if any Goat farming	173	1731	588	2319	974	628	1602	746	367	1113	3451	1583	5034
TOTAL	879	10890	2778	13668	3387	2055	5442	3493	1824	5317	17770	6657	24427
V. Home Science/Women	empowerr	nent											
Household food security by kitchen gardening and nutrition gardening	87	560	1361	1921	120	584	704	351	161	512	1031	2106	3137
Design and development of low/minimum cost diet	31	98	352	450	30	212	242	65	73	138	193	637	830
Designing and development for high nutrient efficiency diet	33	120	288	408	32	216	248	8	68	76	160	572	732
Minimization of nutrient loss in processing	42	327	533	860	84	123	207	117	102	219	528	758	1286
Gender mainstreaming through SHGs	46	170	366	536	297	328	625	72	201	273	539	895	1434
Storage loss minimization techniques	37	352	499	851	51	120	171	31	52	83	434	671	1105
Enterprise development	32	179	315	494	89	118	207	28	126	154	296	559	855
Value addition	137	601	1722	2323	253	643	896	221	268	489	1075	2633	3708
Income generation activities for empowerment of rural Women	97	447	1297	1744	97	490	587	48	342	390	592	2129	2721
Location specific drudgery reduction technologies	51	97	532	629	40	281	321	34	151	185	171	964	1135
Rural Crafts	29	4	453	457	0	127	127	0	76	76	4	656	660
Women and child care	85	124	1312	1436	19	554	573	99	267	366	242	2133	2375
Others, if any	156	790	1396	2186	262	680	942	118	419	537	1170	2495	3665
TOTAL	863	3869	10426	14295	1374	4476	5850	1192	2306	3498	6435	17208	23643
VI. Agril. Engineering													
Installation and maintenance of micro irrigation systems	69	1178	116	1294	245	182	427	182	126	308	1605	424	2029
Use of Plastics in farming practices	36	623	56	679	115	59	174	105	24	129	843	139	982

-	No. of Courses				No. o	of Partic	ipants				Gi	rand To	tal
			Other			SC			ST				
		М	F	Т	М	F	Т	Μ	F	Т	М	F	Т
Production of small tools and implements	41	648	52	700	147	55	202	203	27	230	998	134	1132
Repair and maintenance of farm machinery and implements	140	2988	267	3255	682	125	807	259	58	317	3929	450	4379
Small scale processing and value addition	39	638	54	692	156	69	225	88	29	117	882	152	1034
Post Harvest Technology	51	820	108	928	213	64	277	151	168	319	1184	340	1524
Others, if any	92	1349	116	1465	415	75	490	446	150	596	2210	341	2551
TOTAL	468	8244	769	9013	1973	629	2602	1434	582	2016	11651	1980	13631
VII. Plant Protection													
Integrated Pest Management	653	12496	1200	13696	2930	591	3521	1544	592	2136	16970	2383	19353
Integrated Disease Management	297	5695	474	6169	1134	385	1519	669	191	860	7498	1050	8548
Bio-control of pests and diseases	54	646	126	772	197	48	245	200	105	305	1043	279	1322
Production of bio control agents and bio pesticides	20	333	24	357	63	25	88	74	28	102	470	77	547
Others, if any	139	2168	483	2651	958	240	1198	1294	825	2119	4420	1548	5968
TOTAL	1163	21338	2307	23645	5282	1289	6571	3781	1741	5522	30401	5337	35738
VIII. Fisheries													
Integrated fish farming	31	379	78	457	196	9	205	128	38	166	703	125	828
Carp breeding and hatchery management	14	236	10	246	84	20	104	40	5	45	360	35	395
Carp fry and fingerling rearing	18	247	14	261	111	17	128	31	9	40	389	40	429
Composite fish culture	79	2090	795	2885	843	264	1107	375	89	464	3308	1148	4456
Hatchery management and culture of freshwater prawn	19	325	22	347	120	6	126	64	47	111	509	75	584
Breeding and culture of ornamental fishes	5	87	10	97	16	0	16	19	16	35	122	26	148
Fish processing and value addition	4	59	26	85	10	2	12	4	2	6	73	30	103
Others, if any	72	1019	117	1136	603	54	657	220	32	252	1842	203	2045
TOTAL	242	4442	1072	5514	1983	372	2355	881	238	1119	7306	1682	8988
IX. Production of Inputs	at site												
Seed Production	47	1245	103	1348	161	16	177	7	1	8	1413	120	1533
Planting material production	5	98	3	101	26	2	28	20	20	40	144	25	169
Bio-agents production	1	9	0	9	21	4	25	0	0	0	30	4	34
Bio-pesticides production	8	74	4	78	21	6	27	11	0	11	106	10	116



-	No. of Courses				No. o	of Partic	ipants				G	rand To	tal
			Other			SC			ST				
		М	F	Т	Μ	F	Т	Μ	F	Т	Μ	F	Т
Bio-fertilizer production	5	130	9	139	23	5	28	0	0	0	153	14	167
Vermi-compost production	37	318	175	493	84	35	119	95	55	150	497	265	762
Organic manures production	18	85	22	107	30	12	42	134	68	202	249	102	351
Production of fry and fingerlings	1	21	5	26	1	2	3	0	0	0	22	7	29
Production of Bee- colonies and wax sheets	7	37	6	43	3	0	3	29	27	56	69	33	102
Small tools and implements	1	8	2	10	3	2	5	5	4	9	16	8	24
Production of livestock feed and fodder	2	31	16	47	8	1	9	0	0	0	39	17	56
Production of Fish feed	8	169	29	198	17	7	24	5	0	5	191	36	227
Others, if any	22	396	115	511	89	25	114	10	5	15	495	145	640
TOTAL	162	2621	489	3110	487	117	604	316	180	496	3424	786	4210
X. Capacity Building and	l Group Dy	mamics											
Leadership development	27	436	75	511	59	13	72	73	35	108	568	123	691
Group dynamics	43	790	102	892	98	30	128	73	61	134	961	193	1154
Formation and Management of SHGs	77	739	501	1240	413	273	686	52	63	115	1204	837	2041
Mobilization of social capital	21	411	9	420	43	9	52	28	15	43	482	33	515
Entrepreneurial development of farmers/ youths	77	1019	242	1261	221	122	343	325	280	605	1565	644	2209
WTO and IPR issues	4	71	7	78	18	13	31	5	0	5	94	20	114
Others, if any (Women Legal Rights)	48	1366	105	1471	253	58	311	102	61	163	1721	224	1945
TOTAL	297	4832	1041	5873	1105	518	1623	658	515	1173	6595	2074	8669
XI Agro-forestry													
Production technologies	82	1724	8	1732	69	7	76	143	37	180	1936	52	1988
Nursery management	4	91	3	94	5	3	8	15	8	23	111	14	125
Integrated Farming Systems	14	167	52	219	47	22	69	21	4	25	235	78	313
TOTAL	100	1982	63	2045	121	32	153	179	49	228	2282	144	2426
XII. Others (Pl. Specify)	32	373	144	517	161	43	204	62	27	89	596	214	810
TOTAL	7848	116917	27305	144222	31288	13342	44630	25868	12943	38811	174073	53590	227663



A further classificications of thematic area-wise training programmes organized by the KVKs reveals that altogher 1848 number of courses were conducted by the KVKs for 46951 farmers and 8112 farm women in crop production thematic area. Among various sub-thematic areas, highest number of courses (406) was offered in integrated crop management and least number of courses (54) in fodder production. Other sub-thematic areas in order of courses organized were seed production (262), general crop cultivation (258), weed management (190), resource conservation technologies (185), nursery management (99), cropping systems (91),

integrated farming (89) and others (Table). The participation of women was found highest in general cultivation of crops (1804), integrated crop management (1406), weed management (822), seed production (787), integrated farming (503) and others. The overall participation of farm-women in this thematic area was to the extent of 14.7 per cent.

In horticulture as a whole, 1111 number of courses were organized for 30692 farmers of which 6169 were women (20.1%). Among seven sub-thematic areas, highest number of courses was offered in cultivation of vegetable crops (682) for 18981 number of farmers followed by cultivation of fruit (251 courses for 6606 farmers), ornamental plants (39 courses for 1023 farmers) and others.

Plant protection was the third-most important area of training both in respect of number of courses offered and participation of farmers took place. In this thematic area, 1163 number of training programmes was organized for 35738 farmers. Integrated pest management and integrated disease management were the two major areas where 653 and 297 number of training programmes were conducted by the KVKs for 19353 and 8548 number of farmers, respectively.

Livestock production and management was another important thematic area both in terms of training programmes organized and participation of farmers. The KVKs orgnaized 879 number of courses for the beneift of 24427 farmers of which 6657 (27.3%) participants were farm-women. The major areas covered were disease management (216 number of courses), goat farming (173 courses), dairy management (164 courses), feed management (135 courses) and others. The trend of participation also commensurated the number of courses offered with highest partcipation recorded in disease management (6034 farmers), goat farming (5034 farmers), dairy management (4505 farmers), feed management (3498 farmers) and others.

In terms of courses offered and participation took place, home science/women empowerment was the next

important thematic area where 863 number of courses were conducted for 23643 farmers. However, nearly 73 per cent (72.8%) of the participants was women. In the areas of value addition and kitchen and nutritional gardening, participation of farmers was more compared to other thematic areas, otherwise all other thematic areas were dominated by farm women only.

Repair and maintenance of farm machinery and implements, was the most important sub-thematic area under agricultural engineering thematic area both in terms of courses conducted and farmers participated. In this thematic area, 468 number of courses were offered to 13631 farmers out of which 140 courses were in repair and maintenance of farm machinery. The participation of farmers in this sub-thematic area was to the extent of 4379 number of 32.1 percent. Installation and maintenance of micro-irrigation systems was the second-most important area where 69 courses were offered to 2029 farmers. The overall participation of farm-women was to the tune of 14.5 per cent.

In fisheries, 242 number of courses were conducted by the KVKs for the participation of 8988 farmers and farmwomen. However, the participation of farm-women was recorded as high as 18.7 per cent. Among various subthematic areas, composite fish culture attracted most number of participants (4456) followed by integrated fish farming, carp fry and fingerling rearing and others.

KVKs also conducted 297 number of courses for 8669 farmers and farm-women in capacity building and group dynamics. Major areas covered in this thematic area included formation and management of SHGs as well as entrepreneurrial development of farmers/youths (77 number of courses each), women legal rights (48 number), group dynamics (43 courses), leadership development (27 number) and others. However, hightest number of aprticipation was recorded in entrepreneurual development (2209) folloed by formation of SGHs, women legal rights (1945), group dynamics and others.

Production of inputs at site was another area where 162 number of courses were conducted for 4210 participants. Seed production, vermicompost production, organic manure production and others were the major area of training.

The KVKs also covered agro-forestry through this training courses and 100 number of courses were organized in this thematic area of 2426 farmers and farmwomen. Production technologies and integrated farming systems were the major area where 1988 and 313 farmers participated.

The overall analysis of the training programmes organized by the KVKs of Zone-II indicates that KVKs have tried to



provide required skill and knowledge to the farmers and farm-women in various aspects to enable them to enhance the production and productivity of crops, livestock, fishery and all other areas. Moreover, concentration on certain areas like group dynamics, women empowerment, production of inputs at site etc. has helped the farmwomen in improving their socio-economic condition through SHG/group formation which is a welcome step on the part of KVKs.

RURAL YOUTHS: Rural youths and girls are the most important workforce in the village. These people are mostly school dropouts and in search of employment in early age. KVKs of Zone-II regularly organize training programme for generation of self employment by them Sometime motivational courses are organized to motivate these people to ook up jobs.

In the course of inculcating knowledge and skill, the KVKs conducted 2092 number of training programmes for benefit of 48291 rural youths and girls during

Table: Training programme for rural youth

2014-15. Among the participants 19.2% each were in the cateogry of Schedule Caste and Schedule Tribe. In terms of preferred courses, mushroom production was mostly prefrred by trainees. A total of 206 courses were offered for 5067 rural youths while training on integrated farming system attracted more people from the rural youths. Total participant in this categoy was 4509 in 477 courses. In seed production 112 courses were organized for 2924 trainees, sheep and goat rearing training was taken by 2146 rural youths and girls and 84 courses were organized for them. Other important areas for self employment training were repair and maintenance of farm machinery (81 courses for 1849 participants), nursery management training (79 courses for 1687 participants), dairing (62 courses for 1182 participants) and composite fish culture (40 courses for 1080 participants). Overall picture showed that tural youths and girls have rely on the training from the KVKs for self employment gneration and additional income. The details are given in following Table.

			ON	I + OFF	CAM	PUS							
Thematic Area	No. of Courses				Gi	rand Tot	tal						
			Other			SC			ST				
		М	F	Т	М	F	Т	М	F	Т	М	F	Т
Mushroom Production	206	1929	1076	3005	486	517	1003	516	543	1059	2931	2136	5067
Bee-keeping	80	778	269	1047	90	117	207	114	41	155	982	427	1409
Integrated farming	177	2494	355	2849	586	384	970	543	147	690	3623	886	4509
Seed production	112	1922	137	2059	401	67	468	304	93	397	2627	297	2924
Production of organic inputs	87	834	434	1268	180	124	304	353	91	444	1367	649	2016
Planting material production	62	621	111	732	168	32	200	149	27	176	938	170	1108
Vermi-culture	79	957	171	1128	223	99	322	313	124	437	1493	394	1887
Sericulture	9	75	5	80	8	2	10	48	18	66	131	25	156
Protected cultivation of vegetable crops	48	589	81	670	158	43	201	120	20	140	867	144	1011
Commercial fruit production	67	696	83	779	152	25	177	60	22	82	908	130	1038
Repair and maintenance of farm machinery and implements	81	1205	112	1317	257	95	352	195	35	230	1657	242	1899
Nursery Management of Horticulture crops	79	943	140	1083	221	96	317	188	99	287	1352	335	1687
Training and pruning of orchards	20	240	27	267	28	16	44	57	18	75	325	61	386
Value addition	131	686	1274	1960	291	396	687	68	384	452	1045	2054	3099
Production of quality animal products	16	162	75	237	34	27	61	43	9	52	239	111	350
Dairying	62	672	186	858	112	91	203	92	29	121	876	306	1182
Sheep and goat rearing	84	722	237	959	357	162	519	273	395	668	1352	794	2146
Quail farming	5	43	0	43	16	19	35	0	0	0	59	19	78

			Ur	+ OFF	CAM	205							
Thematic Area	No. of Courses				No. of	Partici	pants				Gi	and To	tal
			Other			SC			ST				
Piggery	22	119	15	134	70	17	87	231	117	348	420	149	569
Rabbit farming	4	29	24	53	11	1	12	17	7	24	57	32	89
Poultry production	92	622	228	850	169	75	244	366	152	518	1157	455	1612
Ornamental fisheries	17	90	94	184	70	78	148	90	45	135	250	217	467
Enterprise development	45	329	145	474	109	31	140	83	36	119	521	212	733
Para vets	7	14	0	14	0	0	0	36	13	49	50	13	63
Para extension workers	23	392	71	463	78	25	103	0	0	0	470	96	566
Composite fish culture	40	466	210	676	197	41	238	152	14	166	815	265	1080
Fish harvest and processing technology	3	0	13	13	0	25	25	30	0	30	30	38	68
Fry and fingerling rearing	12	139	12	151	83	5	88	60	0	60	282	17	299
Small scale processing	31	144	332	476	43	92	135	28	47	75	215	471	686
Post Harvest Technology	36	344	288	632	94	99	193	77	55	132	515	442	957
Tailoring and Stitching	58	66	792	858	22	210	232	0	87	87	88	1089	1177
Rural Crafts	33	0	487	487	13	80	93	0	40	40	13	607	620
Others, if any (ICT application in agriculture)	264	2490	1445	3935	961	495	1456	1129	833	1962	4580	2773	7353
TOTAL	2092	20812	8929	29741	5688	3586	9274	5735	3541	9276	32235	16056	48291

EXTENSION FUNCTIONARIES: Extension functionaries of state Govt. departments are very much intereated in obtaining training from the KVKs. Because KVKs helps in updating technological knowledge skill in the frontier areas of the agriculture and allied technologies. During the last year, 781 courses were organized for 25612 extension functionaries in different areas of production, capacity development and management of agriculture and animals. Out of the total extension functionaries trained 16.5% were female functionaries, 83.5% were male fanctionaries. The functionaris trained were 17.6% from schedule caste and 13.8% were from schedule tribe category. Among the field choosen for updating of knowledge were crop production and integrated farming system was in top of the list.. About 135 courses were organized for 4941

extension functionaries in the field of crop peoduction and management. Integrated pest management was in second portion as per as training of extension functionaries are concerned. In this area 100 courses were organized for 3436 extension staff. Training on SHGs and group dynamics was also proposed by the extension functionaries where total participants were 2533 in 65 courses. Other important areas were integrated nutrient management (56 courses for 1432 participants), care of maintenance of farm machinery (46 courses for 1291 participants), protected cultivation (30 courses for 824 participants). The details were given in following Table. In order to extend the benefit to large number of extension worker, these category of training includes teachers, NGO staff and other agricultural staff of the districts.

Fable: Trai r	ning programme	for extension	functionaries
----------------------	----------------	---------------	---------------

ON + OFF CAMPUS													
Thematic Area	No. of Courses		No. of Participants								Gi	rand To	tal
			Other SC ST										
		Μ	M F T M F T M F T							Μ	F	Т	
Productivity enhancement in field crops	135	3446	3446 220 3666 529 59 588 609 78 687							4584	357	4941	
Integrated Pest Management	100	2461	2461 280 2741 453 99 552 126 17 143 3040 396							3436			

ICAR-ZPD II

TOTAL	781	15138	2436	17574	3442	1063	4505	2819	714	3533	21399	4213	25612
Others, if any	169	2954	498	3452	1316	341	1657	825	207	1032	5095	1046	6141
Gender mainstreaming through SHGs	7	60	49	109	11	66	77	12	3	15	83	118	201
Production and use of organic inputs	29	477	77	554	75	21	96	36	8	44	588	106	694
Low cost and nutrient efficient diet designing	9	69	134	203	21	51	72	5	8	13	95	193	288
Women and Child care	34	13	620	633	8	141	149	0	185	185	21	946	967
Household food security	26	427	131	558	80	66	146	15	15	30	522	212	734
Livestock feed and fodder production	10	180	16	196	35	3	38	22	9	31	237	28	265
Management in farm animals	23	401	40	441	45	21	66	44	32	76	490	93	583
WTO and IPR issues	1	16	5	21	0	0	0	5	1	6	21	6	27
Care and maintenance of farm machinery and implements	46	944	61	1005	178	37	215	69	2	71	1191	100	1291
Capacity building for ICT application	9	142	22	164	22	4	26	74	13	87	238	39	277
Information networking among farmers	8	86	7	93	42	4	46	66	10	76	194	21	215
Group Dynamics and farmers organization	38	825	45	870	230	41	271	559	70	629	1614	156	1770
Formation and Management of SHGs	27	457	66	523	109	48	157	59	24	83	625	138	763
Protected cultivation technology	30	550	32	582	110	36	146	84	12	96	744	80	824
Rejuvenation of old orchards	24	589	61	650	75	11	86	16	11	27	680	83	763
Integrated Nutrient management	56	1041	72	1113	103	14	117	193	9	202	1337	95	1432

SPONSORED TRAINING PROGRAMME

With the increased visibility of KVKs of Zone-II towards agricultural development in general and capacity building of farmers in particulars, a number of govt. and other organizations are approaching the KVKs to get their clientels trained in various aspects of agricultural development, livestock rearing, fishery, post-harvest technology and value addition, farm machienry, women empowerment/home science, capacity building etc. The KVKs, on the other hands, have tried to fulfill the expectations of those organizations apart from working on the mandated activities. In the process of sharing expertise with those organizations, the KVKs trained 105070 number of farmers, youths and other stakeholders during last one year by offering 1868 number of courses of varied duration.

A close look in the programmes conducted and participation took place indicates that under seven broad areas of training conducted, highest number of courses offered in crop production and management alongwith maximum number of participants (559 courses and 48257 participants, respectively) followed by livestock and fisheries (410 courses and 6723 participants), production and value addition (406 courses and 23105 participants), farm machinery (212 courses and 7426 participants) and others. The trend of participation indicates that the sponsoring organizations preferred to get their clientele trained in those areas where the participants might start their own venture for self-employment. However, except in home science, all other thematic areas were dominated by male participants which need to be looked into.





Area of training	No. of	f General			SC/ST		Grand Total			
	courses	Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management										
Increasing production and productivity of crops	493	36737	2177	38914	5451	1704	7155	42188	3881	46069
Commercial production of vegetables	66	1534	137	1671	436	81	517	1970	218	2188
Total	559	38271	2314	40585	5887	1785	7672	44158	4099	48257
Production and value addition										
Fruit Plants	25	823	130	953	210	32	242	1033	162	1195
Ornamental plants	3	128	35	163	37	29	66	165	64	229
Soil health and fertility management	69	4676	447	5123	920	207	1127	5596	654	6250
Production of Inputs at site	11	133	2	135	83	0	83	216	2	218
Methods of protective cultivation	19	117	14	131	17	0	17	134	14	148
Others (pl. specify)	279	11189	807	11996	2467	602	3069	13656	1409	15065
Total	406	17066	1435	18501	3734	870	4604	20800	2305	23105
Post harvest technology and value addition										
Processing and value addition	15	113	29	142	6	61	67	119	90	209
Others (pl. specify)	17	150	47	197	7	3	10	157	50	207
Total	32	263	76	339	13	64	77	276	140	416
Farm machinery										
Farm machinery, tools and implements	65	5207	288	5495	686	105	791	5893	393	6286
Others (pl. specify)	147	838	50	888	253	35	288	1091	85	1176
Total	212	6045	338	6383	939	140	1079	6984	478	7462
Livestock and fisheries										
Livestock production and management	79	854	292	1146	632	576	1208	1486	868	2354
Animal Nutrition Management	2	53	0	53	25	2	27	78	2	80
Animal Disease Management	6	311	17	328	74	18	92	385	35	420
Fisheries Management	20	246	49	295	148	10	158	394	59	453
Others (pl. specify)	303	1631	792	2423	671	322	993	2302	1114	3416
Total	410	3095	1150	4245	1550	928	2478	4645	2078	6723
Home Science										
Household nutritional security	34	3	13	16	329	120	449	332	133	465
Economic empowerment of women	6	17	225	242	0	120	120	17	345	362
Others (pl. specify)	21	134	286	420	166	254	420	300	540	840
Total	61	154	524	678	495	494	989	649	1018	1667
Agricultural Extension										
Capacity Building and Group Dynamics	72	2128	319	2447	604	107	711	2732	426	3158
Others (pl. specify)	116	11647	1035	12682	1332	268	1600	12979	1303	14282
Total	188	13775	1354	15129	1936	375	2311	15711	1729	17440
GRAND TOTAL	1868	78669	7191	85860	14554	4656	19210	93223	11847	105070



VOCATIONAL TRAINING PROGRAMME

Vocational training in different areas of crop production, livestock rearing, fishery, post harvest technology, value addition are the part of KVK training programme which helps to build up trained manpower who can take up self employment in different areas of ural farming. Voccation courses are being longer duration, these training helps to upgrade the skill and knowledge of the rural youths and farmers. During the year 2014-15, KVKs of Zone II organized 3019 courses different areas of agriculture and allied sector which covered 12699 rural youths and 4090 rural girls. Among total trained process 11785 were in general cateogry and 5004 were in SC/ST cateogy. After obtaining such training 2880 persons became self employed and 11785 persons were employed elsewhere.

Category-wise analysis of vocational training showed that rural youths and girls prefered maximum training in mushroom production. 1810 urral youths and girls were trained through 259 courses during the year. In preference of the trainees commercial vegetable prouction were second where 1167 participants were trained through 142 courses. Sheep and goat rearing was on demand by many of the trinees. 1076 rural youth and girls took this training through 104 courses. About 1066 participants were trained in serculture 20 courses. Vermicomposting, dairy farming and poltry farming were also liked by trainees and 867, 993 and 964 trainees, respectively, took these training.

State-wise analysis showed that the in Bihar vocational courses were represented by 80.5% male trainees and 19.5% female. Whereas in the state of Jharkhand among the vocational trainnes 57.3% were male and 42.7% were female. West Bengal recorded higher percentage of male 72.9% against 20.8% female among the vocational trainees. Trend indicated that rural girls in Jharkhand are more interested in getting the training to make them self employed in their rural areas.

Area of Training	No. of courses		No of Participants								Self	No. of persons		
			General SC/ST Grand Total				al	Type of units	No. of units	No. of persons employed	em- ployed else where			
		Male	Female	Total	Male	Female	Total	Male	Female	Total				
Commercial floriculture	12	50	12	62	21	6	27	71	18	89	12	50	12	62
Commercial fruit production	100	533	29	562	226	11	237	759	40	799	100	533	29	562
Commercial vegetable production	142	725	91	816	312	39	351	1037	130	1167	142	725	91	816
Total	254	1308	132	1440	559	56	615	1867	188	2055	254	1308	132	1440
Others	143	579	58	637	246	25	271	825	83	908	143	579	58	637
Total	143	579	58	637	246	25	271	825	83	908	143	579	58	637
Value addition	98	147	470	617	62	201	263	209	671	880	98	147	470	617
Others	18	228	36	264	97	14	111	325	50	375	18	228	36	264
Total	116	375	506	881	159	215	374	534	721	1255	116	375	506	881
Dairy farming	164	647	48	695	276	22	298	923	70	993	164	647	48	695
Composite fish culture	144	234	65	299	98	27	125	332	92	424	144	234	65	299
Sheep and goat rearing	104	626	128	754	268	54	322	894	182	1076	104	626	128	754
Piggery	45	172	53	225	75	21	96	247	74	321	45	172	53	225
Poultry farming	209	578	98	676	247	41	288	825	139	964	209	578	98	676
Others	67	235	33	268	98	12	110	333	45	378	67	235	33	268
Total	733	2492	425	2917	1062	177	1239	3554	602	4156	733	2492	425	2917
Vermicomposting	125	493	116	609	211	47	258	704	163	867	125	493	116	609

Table: Vocational training conducted in Zone-II

Area of Training	No. of courses	No of Participants							Self	ed after ng	No. of persons			
			General		SC/ST			Grand Total			Type of units	No. of units	No. of persons employed	em- ployed else where
		Male	Female	Total	Male	Female	Total	Male	Female	Total				
Production of bio- agents, bio-pesticides, bio-fertilizers etc.	28	145	101	246	59	44	103	204	145	349	28	145	101	246
Repair and maintenance of farm machinery and implements	216	454	2	456	195	1	196	649	3	652	216	454	2	456
Rural Crafts	132	433	130	563	185	53	238	618	183	801	132	433	130	563
Seed production	98	718	28	746	308	12	320	1026	40	1066	98	718	28	746
Sericulture	20	75	5	80	32	2	34	107	7	114	20	75	5	80
Mushroom cultivation	259	723	552	1275	305	230	535	1028	782	1810	259	723	552	1275
Nursery, grafting etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tailoring, stitching, embroidery, dying etc.	383	19	328	347	7	139	146	26	467	493	383	19	328	347
Agril. Para-workers, para-vet training	4	15	0	15	7	0	7	22	0	22	4	15	0	15
Others	373	767	368	1135	327	154	481	1094	522	1616	373	767	368	1135
Total	1638	3842	1630	5472	1636	682	2318	5478	2312	7790	1638	3842	1630	5472
Capacity building and group dynamics	97	125	65	190	54	28	82	179	93	272	397	125	65	190
Others	38	184	64	248	78	27	105	262	91	353	38	184	64	248
Total	435	309	129	438	132	55	187	441	184	625	435	309	129	438
Grand Total	3019	8905	2880	11785	3794	1210	5004	12699	4090	16789	3319	8905	2880	11785

4.4. EXTENSION ACTIVITIES

In creating awareness among farmers about the benefit of advanced agricultural and allied technologies, scientific livestock rearing, fish fingerling production, soil testing, group farming and other related aspects, the KVKs of Zone II organized 139541 number of various extension activities to reach out 949296 farmers and extension officials. Among the beneficiaries farmers constituted 864871 number of participants and 24986 were extension officials. Gender-wise classification indicates that 192400 number of women took part in various extension activities against 690192 number of male farmers. In respect of extension officials, however, only 3589 members were women extension officials and rest 21451 was male extension officials. The overall participation trained indicates that nearly 20% of the total participants belonged to women category. In respect of programme organized, farmers' visit to KVK where 57345 number of programmes were organized by the KVKs to facilitate 87108 farmers and farmwomen to visit KVKs. Advisory service was the second most important programme for the KVKs who provided 52064 number of advisory services to 52966 number of farmers and farmwomen. The KVK personnel also paid visit 13334 times to the farmers' field to interact with 66812 numbers of farmers and farmwomen followed by 5098 times diagnostic visit to provide solution against crop/livestock related problem of 14733 number of farmers. The KVKs also extended their expertise through delivering 2512 number of lectures as resource person. Other important extension activities carried out by the KVKs include conducting kisangosthi, field day, film show, method demonstration, group meeting, soil test campaign, self-help group mahilamandal 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 93853 number of extension activities for the benefit of 417726 number of farmers, farmwomen and extension officials. Visit of farmers to KVK (36216 number), providing advisory services (41197 number), visit of scientists to farmers' field (6782 times), diagnostic



The KVKs of Jharkhand conducted 14681 number of various extension activities for 128971 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, kisangosthi, field day, film show, soil test camping etc. With regard to participation 16959 number of farmers were benefitted from the diagnostic visit of KVK staff to their fields followed by visit of 16298 farmers in the KVKs. More than 32,000 farmers participated in the kisanghosthiand more than 12,000 farmers participated in kisanmela. During field day, 12708 farmers were present whereas 5710 number of farmers attended the lecture of KVK personnel.

In organizing extension activities, the KVKs of West Bengal took up 29555 number of such activities for the benefit of 394189 number of farmers and extension personnel. In this state also highest number of activities (15845) was conducted in organizing diagnostic visits, providing advisory services to 12912 number of farmers through 6578 activity, scientific visit to farmers fields were 3715 number of activity for 25968 number of farmers, diagnostic visit (1090 numbers) to provide agriculture and related problems to 2720 farmers. However, highest number of participants was recorded in kisanmela (134958



number) and exhibition (61309 number). More than 17,000 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, 1452 number of various extension activities were conducted for the benefit of 8410 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.



Exposure visit



Extension activities in KVKs







Table: Extension activities conducted in Zone II

Nature of Extension	No. of		Farmers		Exte	nsion Offic	ials	Total			
Activity	activities	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Field Day	762	23999	6770	30759	817	156	973	24507	6908	32378	
KisanMela	319	167572	80126	224841	5136	831	5967	176174	62761	249292	
KisanGhosthi	1056	104267	27072	131309	3563	448	4009	105207	27308	134012	
Exhibition	103	44521	16749	61270	849	148	997	44572	15029	70208	
Film Show	948	13510	4412	16600	281	52	321	13491	4446	20630	
Method Demonstrations	2077	6242	2255	8575	250	90	340	6492	2353	8923	
Farmers Seminar	84	5418	1866	7284	403	60	436	5724	2026	7800	
Workshop	143	5551	1081	6657	2138	115	2238	7625	1057	8680	
Group meetings	236	7985	3429	11619	335	37	372	8420	3335	12464	
Lectures delivered as resource persons	2512	45444	8560	54605	1681	377	2046	46627	8972	59112	
Advisory Services	52064	28681	4627	32533	745	178	923	28434	4710	52966	
Scientific visit to farmers field	13334	50978	11108	62069	747	58	815	51540	10729	66812	
Farmers visit to KVK	57345	70115	14958	83763	1283	234	1515	67010	14750	87108	
Diagnostic visits	5098	11265	2295	13605	249	17	264	10707	2311	14733	
Exposure visits	329	6301	1104	7417	275	59	359	6330	1062	7756	
Ex-trainees Sammelan	31	1731	412	2093	143	11	152	1792	421	2213	
Soil health Camp	528	3578	837	4415	105	11	116	3632	837	4240	
Animal Health Camp	357	41708	9472	51330	261	24	283	41743	9445	51272	
Agri mobile clinic	912	1965	328	2293	29	11	40	1995	338	2198	
Soil test campaigns	184	3675	373	4048	89	16	103	3634	379	4123	
Farm Science Club Conveners meet	97	1564	237	1801	217	113	328	1781	348	2321	
Self Help Group Conveners meetings	106	662	1882	2544	50	170	218	712	2050	2716	
MahilaMandals Conveners meetings	27	6	591	597	2	13	13	8	602	610	
Celebration of important days	356	13825	5596	21418	811	272	1079	13947	5815	23838	
Video conferencing	26	511	303	814	15	4	19	526	307	833	
KisanChaupal	507	16525	4017	20612	977	84	1060	17562	4101	22058	
Total	139541	677599	210460	864871	21451	3589	24986	690192	192400	949296	

Table: Extension activities organized in different states

Nature of Extension	A N Islands		В	ihar	Jha	rkhand	West Bengal		
Activity	No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants	
Field Day	17	363	344	12699	178	12708	223	6608	
Kisan Mela	2	700	223	80805	61	32829	33	134958	
Kisan Ghosthi	3	975	807	111124	201	8893	45	13020	
Exhibition	29	383	39	7550	11	966	24	61309	
Film Show	8	142	320	4231	265	5744	355	10513	

ICAR-ZPD II



Method Demonstrations	12	220	1972	5590	37	735	56	2378
Farmers Seminar	0	0	45	5116	1	92	38	2592
orkshop	0	0	78	5961	42	1877	23	842
Group meetings	6	233	126	2310	27	1168	77	8753
Lectures delivered as resource persons	46	540	1224	35519	662	5710	580	17343
Advisory Services	128	213	41197	34270	4161	5571	6578	12912
Scientific visit to farmers field	801	1636	6782	22910	2039	16298	3712	25968
Farmers visit to KVK	158	170	36216	34567	5126	16959	15845	35412
Diagnostic visits	225	290	2276	5946	1507	5777	1090	2720
Exposure visits	6	104	152	4040	66	1861	105	1751
Ex-trainees Sammelan	0	0	21	1386	4	265	6	562
Soil health Camp	0	0	414	1204	35	1479	79	1557
Animal Health Camp	2	50	63	4378	27	1035	265	45809
Agri mobile clinic	0	0	835	986	2	56	75	1156
Soil test campaigns	0	0	45	2128	102	1138	37	857
Farm Science Club Conveners meet	0	0	21	765	24	539	52	1017
Self Help Group Conveners meetings	2	24	53	1712	14	429	37	551
MahilaMandals Conveners meetings	1	20	14	365	8	180	4	45
Celebration of important days (specify)	3	2246	107	11569	30	4467	216	5556
Any Other (Technology Week)	3	101	23	732	0	0	0	0
KisanChaupal	0		456	19863	51	2195	0	0
Total	1452	8410	93853	417726	14681	128971	29555	394189

4.4.1 Other Extension activities

The KVKs also exercised for other means of communication like publishing through newspaper, radio/TV talks, writing popular article, preparing extension literature as well as organizing awareness camps etc. The KVKs of Zone-II conducted 32300 number of such extension activities for the benefit of farmers. The KVKs prepared and distributed 26091 extension literature depicting cultivation technique of crops, vegetables, fish rearing, livestock rearing etc. in local vernacular. Among all the states, KVKs of Jharkhand developed and distributed highest number (13564) of extension literature followed by Bihar (12340). KVK personnel of delivered TV talk 306 times in Jharkhand, 117 times in Bihar, 86 times in West Bengal and 14 times in A & N Islands. Activities of KVKs of West Bengal and A N Islands also were published through newspaper by 178 times and 9 times, respectively.

Table: Other Extension Activities organized in different states

Nature of Extension Activity	Number of Activities									
	Bihar	Jharkhand	West Bengal	A N Island	Total					
Newspaper coverage	2252	674	114	6	3046					
Radio talks	153	30	97	6	286					
TV talks	117	306	86	14	523					
Popular articles	163	26	17	8	214					
Extension Literature	12340	13564	178	9	26091					
Other	923	0	1217	0	2140					
Total	15948	14600	1709	43	32300					



5. PRODUCTION OF SEED/PLANTING MATERIAL AND BIO-PRODUCTS

5.1 **SEED**

Production of seed by KVKs (farm and village seed production)

S eed is the most critical input in crop production system. Frequent failure of monsoon in these years necessiated alternate early maturing varieties. Seed production system developed by the KVK included village seed production and seed production at KVK farm. A number of new varieties like Swarna Sub-1 in paddy has been included in the seed production system.

During this year 2014-15, the KVKs produced 114300.7 q of seed and disributed among 85591 farmers and reamining also supplied to different Govt. agencies and

institutes. The contribution of different crops in seed production system are paddy 63.9%, oil seeds 6.47%, pulse 5.14% and other crops constitute 24.22%. Paddy seed was produced 69393.34 q, wheat seed was 19461.25 q, mustard was 9743.38 q, lentil was 1141.57 q, greengram 167.41 q, toria was 13.06 q, while potato and sugarcane was 6790 and 8700 q, respedtively. Green manure crop dhaincha was produced 367.78 q. Other crops for which seed production was made were turmeric, chickpea, niger, sesame, linseed, blackgram, pea etc.

These seed production programme was in two parts KVK farm and village seed production programme. Seed production in KVK was 28678.06 q in village seed production programme production was 85622.63 q.

Table: Statewise seed production by the KVKs

	KVK farm				Village		Te		
	Quantity	Value	Farmers	Quantity	Value	Farmers	Quantity	Value	Farmers
AN Islands				101	6680	25	101.10	6680	25
Bihar	8710.67	10516281	3364	32088.61	60296477	31648	40799.28	70812758	35012
Jharkhand	1910.21	4279966	747	17570.60	35157150	22144	19480.81	39437116	22891
WB	18057.18	4691834	6210	35862.42	8779075	21453	53919.60	13470909	27663
Zone II	28678.06	19488081	10321	85622.63	104239382	75270	114300.70	123727463	85591

State-wise analysis of seed production showed that A&N Island produced 101.10 q seed, Bihar 40799.28 q seed, Jharkhand 19480.81 q of seeds during 2014-5. In Bihar 8710.67 q seed was produced in KVK farm while 32088.61 q seed was produced in village seed production programme. In Jharkhand 1910.2 q seed was produced in KVK farm and 17570.60 q seed was produced in village seed production programme. In the state of West Bengal, 18057.18 q seed was produced in KVK frm and 35862.42 q seed was produced in village seed production programme. Major varieties included in the seed production programme were Rajendra Mashuri, Pusa Sughandha, Sahbhagi,

Table: Seed production in Zone II

Name of the crop	Quantity of seed (q)	Value (Rs)	Number of farmers
Paddy	69393.34	58675915	54674
Wheat	19461.25	43612345	19392
Maize	11.68	24203	39
Total	88866.27	102312463	74105
Mustard	9743.38	2398976	4150
Toria	1.1	4400	0
Linseed	4.8	21560	33
Niger	5.89	32830	87

Abhishek, MTU 7029, Prabhat, Swarna Sub-1, Pratima in paddy, HI 1563, DBW-17, DBW-39, PBW-580, HD 2985, HO 3059, K 307, HD 2824, WR 544, HD 2733, K-9107 etc. in wheat, Pusa Mahak, Shavani, Rajendra suflam, B-54, Sita in mustard. Tomato Arka Bikash, Arkha Abha, Rai –GPU-28, Rajendra –Birsa Arhar 1, Mahija 13, NDA-1, Chickpea PG 186, Pusa 362 Groundnut T422, BAU25 Niger – Birsa niger 3, Birsa niger -1 Lentil HUL 57, KLS-218, DPL 62, PL 639 Greengram HUM-16 Sesame – TKG-306 etc. were the major varieties introduced in seed production. The state-wise details of seed production has been provided in the following table

Name of the crop	Quantity of seed (q)	Value (Rs)	Number of farmers
Sesame	92.9	365800	978
Groundnut	73.3	491800	151
Rai	42.56	158573	104
Total	9963.93	3478939	5541
Redgram	218.3	1113620	115
Chickpea	70.78	519525	95
Lentil	1141.57	6381210	2308
Greengram	167.41	1219958	840



Name of the crop	Quantity of seed (q)	Value (Rs)	Number of farmers	Name of the crop	Quantity of seed (q)	Value (Rs)	Number of farmers
Blackgram	68.62	312145	875	Brinjal	1	60000	0
Pea	120.01	918320	35	Total	28.64	181114	210
Cowpea	4.27	161200	128	Turmeric	65.53	75000	178
Rajmash	0.3	3000	0	Total	65.53	55000	78
Total	1791.26	9928978	4396	Barseem	0.5	12500	32
Potato	6790	3519000	200	Total	0.5	12500	32
Sugarcane	8700	2286000	200	Jute	302.5	37500	308
Total	12240	6743000	400	Total	302.5	37500	308
Okra	0.38	8805	51	Dhaincha	367.78	36947	42
Tomato	13.06	16159	158	Elephant	674.276	941022	479
Palak	0.5	150	1	Footyam			
Radish	3.4	9000	0	Total	1042.056	977969	521
Onion	10.3	87000	0	Grand total	114300.7	123727463	85591

Table: State wise seed production

	A & N ISLA	NDS			BIHAR		JI	HARKHAN	D	W	EST BENG	AL
Name of	Quantity	Value	Number of	Quantity	Value (Rs)	Number of	Quantity	Value (Rs)	Number of	Quantity	Value (Rs)	Number of
	oi seed (q)	(RS)	lariilers	oi seeu (q)		larmers	oi seed (q)		larmers	or seed (q)		Tarmers
Cereals												
Paddy	100	2680	15	9771.21	16388331	12531	17628.83	32227844	21690	41893.3	10057060	20438
Wheat	0	0	0	17875.06	39310386	17853	1205.72	4036587	538	380.47	265372	1001
Maize	0	0	0	1.25	1375	0	5.42	5766	32	5.01	17062	7
Total	100	2680	15	27647.52	55700092	30384	18839.97	36270197	22260	42278.78	10339494	21446
Oilseeds												
Mustard				46.3	174806	375	203.85	1406100	170	9493.23	818070	3605
Toria				1.1	4400	0						
Linseed				4.8	21560	33						
Niger				1.5	3000	0	4.39	29830	87			
Sesame				27.5	174000	40	1.5	10500	0	63.9	181300	938
Groundnut				1.1	9300	0				72.2	482500	151
Rai				42.56	158573	104						
Total				124.86	550639	590	209.74	1446430	257	9629.33	1481870	4694
Pulse												
Redgram				196.3	1039620	82	15.5	47000	0	6.5	27000	33
Chickpea				50.55	377800	66	20.23	141725	29			
Lentil				1109.5	6267820	2262	11.2	83440	16	20.87	29950	30
Greengram				167.21	1218358	840				0.2	1600	0
Blackgram										68.62	312145	875
Pea				12.01	108320	35	108	810000				
Cowpea				4	160000	128	0.27	1200				
Rajmash							0.3	3000				
Total				1539.57	8471918	3413	155.5	1086365	45	96.19	370695	938
Cash crops												
Potato				5684.5	3519000	200				1105.5		

	A & N ISLA	ANDS			BIHAR		JI	HARKHAN	D	W	EST BENG	AL
Name of the crop	Quantity of seed (q)	Value (Rs)	Number of farmers	Quantity of seed (q)	Value (Rs)	Number of farmers	Quantity of seed (q)	Value (Rs)	Number of farmers	Quantity of seed (q)	Value (Rs)	Number farmers
Sugarcane				8700	2286000	200						
Total				11134.5	5805000	400				1105.5	938000	0
Vegetable												
Okra				0.18	8605	50				0.2	200	1
Tomato				0.01	1000	52	7.65	3759		5.4	11400	106
Palak										0.5	150	1
Radish										3.4	9000	0
Onion										10.3	87000	0
Brinjal				0.5	60000	0	0.5	0	0	0	0	0
Total				0.69	69605	102	8.15	3759	0	19.8	107750	108
Spices												
Turmeric				20.53	45000	160				45	30000	18
Fenugrick				0	0	0				0	0	0
Total				20.53	25000	60				45	30000	18
Fodder												
Barseem							0.5	12500	32			
Total							0.5	12500	32			
Fibre crops												
Jute				2.5	22500	8				300	15000	300
Total				2.5	22500	8				300	15000	300
Others												
Dhaincha				14.78	11847	2				353	25100	40
Elephant Footyam	1	4000	10	314.33	156157	53	266.946	617865	297	92	163000	119
Total	1	4000	10	329.11	168004	55	266.946	617865	297	445	188100	159
Grand total	101	6680	25	40799.28	70812758	35012	19480 81	39437116	22891	53919.6	13470909	27663

5.2 PLANTING MATERIAL

Planting materials of different crops and varieties were raised by the KVKs in order to provide support to farmers of the region. During 2014-15 27.58 lakh nos. of graft, gooties, seedling, sapling, bulbs, propagating material were produced by the KVKs, which earned a revenue of Rs.239.36 lakh. These planting materials were provided to 16.38 lakh farmers of the zone. Vegetable seedling produced were 18.81 lakh, fruit sapling were 6.99 lakh, forest sapling 0.63 lakh, saplings of medicinal and aromatic plant were 0.332 lakh which contributed 68.2%, 25.3%, 2.3% and 1.2% of total planting material production by the KVKs. State wise analysis showed that West Bengal (13.51 lakh) produced maximum no of planting materials(48.9%), followed by 11.3(40.9 %) in Bihar, 2.18 lakh (7.9%) in Jharkhand and 0.55 lakh(1.99%) in A&N Islands. Varieties which are supplied to the farmers through the planting material multiplication system were Amrapalli, Mallika, Bombay, safedMaldha in mango,G9, Guava- L-49, ArkaMridula in banana, Ganesh in Pomegranate, Rupali, SwarnaSampada, S-22, WP 5005 in tomato, Shyamali,Chayya, VNR 218, PK 123 in brinjal,Greengold, Indira in Capsicum, Bullet, ArkaSufal in chilli,Girija, Sweta, Sheetal, Madhuri in cauliflower,ArkaNiketan, Nasik Red etc. in Onion. The statewise planting material production are provided in below table.

Table: Pla	anting r	nateria	l produ	ction b	y the KV	/Ks in Z	one-11								
	Α	& N Islan	spu		Bihar		ſ	harkhand		>	Vest Bengal		Z	one II total	
Crop	Quantity (No.)	Amount (Rs)	Provided to farmers												
Fruits															
Banana			0	3166	3894	280	600	1500	1	9,380	78,790	265	13146	84184	546
Mango			0	339550	14074130	154010	5070	114800	251	91,843	3,994,531	1,867	436463	18183461	156128
Litchi			0	24930	96985	651613	200	8000	24	1,000	25,000	35	26130	129985	651672
Guava	50		15	24478	513458	19089	4176	24560	369	11,036	346,725	893	39740	884743	20366
Sapota										33,520	1,368,400	326	33520	1368400	326
Lemon	40		10	2703	54320	7185	1666	13555	336	8,655	357,425	1,117	13064	425300	8648
Anola	0		0	19026	5825	754947	0	0	0	100	1,000	50	19126	6825	754997
Papaya	308		343	68910	70857	1203	6938	25266	118	38,652	224,724	1,029	114808	320847	2693
Pomegranate	0		0	1425	22155	2282	20	600	2	0	0	0	1445	22755	2284
Jack fruit	400		408	797	5305	2408				355	3,320	43	1552	8625	2859
Total	798		776	484990	14847229	1593018	18670	188281	1101	194545	6399995	5626	699003	21435505	1600521
Vegetables															
Cauliflower	0006		25	175385	72187	841	17435	7092	153	500,208	245,804	1,158	702028	325083	2177
Brinjal	14506	548	506	84715	32774	549	53842	19108	234	75,145	208,313	333	228208	260743	1622
Tomato	13169	494	775	196556	67787	901	59043	10016	347	214,502	357,982	545	483270	436279	2568
Chilli	11776	313	221	89461	14620	191	7510	4315	56	38,509	72,538	380	147256	91786	848
Bottle gourd				600	3000								600	3000	0
Cabbage				89260	37619	252	22750	2750	366	69,937	39,445	475	181947	79814	1093
Vegetables							0	0	0	64,800	40,130	40	64800	40130	40
Capcicum							3200	3200	30	5,135	6,610	159	8335	9810	189
Brocoli				180	180	8	3500	2050	20	30,398	13,580	94	34078	15810	122
Radish										30,500	10,750	47	30500	10750	47
Total	48451	1355	1527	636157	228167	2742	167280	48531	1206	1029134	995153	3231	1881022	1273206	8706
Mdicinal and	aromatic														
Aloe Vera				1500	4500	0	8500	45000	0	1,200	2,000	12	11200	51500	12
Lemon grass							22000	42000	0	0	0	0	22000	42000	0
Total				1500	4500	0	30500	87000	0	1200	2000	12	33200	93500	12

1	31-118
	3 N
- 1	<u></u>
	100 110
\sim	ICAB.

	Α	& N Islan	ds		Bihar		ſ	harkhand		2	Vest Bengal		2	cone II tota	_
Crop	Quantity (No.)	Amount (Rs)	Provided to farmers	Quantity (No.)	Amount (Rs)	Provided to farmers	Quantity (No.)	Amount (Rs)	Provided to farmers	Quantity (No.)	Amount (Rs)	Provided to farmers	Quantity (No.)	Amount (Rs)	Providec to farmers
Forest sp															
Koronda				175	15	2625							175	15	2625
Forest sp				1309	6685	1342	500			61,000	244,000	187	62809	250685	1529
Total				1484	6700	3967	500			61000	244000	187	62984	250700	4154
Black pepper										2	40	2	2	40	2
Total										2	40	2	2	40	2
Plantation C	do														
Arecanut	2500	2500	50							337	1,680	107	2837	4180	157
Coconut	629	210	643										629	210	643
Total	3129	2710	693							337	1680	107	3466	4390	800
Flowers															
Tuberose				2000		42							2000	0	42
Marigold	2500		4				2000	4000	16	500	300	c	5000	4300	23
Total	2500		4	2000		42	2000	4000	16	500	300	ß	7000	4300	65
Ornamental															
Ornamental				6200	42000	130				64,474	730,052	23,047	70674	772052	23177
Grand total	54878	4065	3000	1132331	15230596	1599899	218950	327812	2323	1,351,192	8,373,220	32,215	2757351	23935693	1637437
		CHILDREN STREET	A CHICK SHE SHE SHE		「「「「「「		A MARKED IN COMPANY		N						





5.3 BIO-PRODUCT

The KVKs of Zone-II aims at supply of bio-fertilizers bio pesticides, bioagent to the farmers to improve the soil condition and productivity of crops. Production of vermicompost, azolla, vermicompost biopesticides, bioagents, earthworms were initiated. A total of 339639.7 kg of bio-fertilizers and bio pesticides were produced and 54349.4 kg of vermicompost bioagents were produced. Out of these, 337545.7 kg was vermicompost, 163.5 kg neem extract, 604.2 kg was NPV and 640.2 kg was fungicide. These bio products were provided to 3235 farmers of the zone.

Table : production of bio product by the KVKs

			BIHAR		JH	ARKHA	ND		WEST F	BENGAL		Zone II	
Product Name	Name of the bio product	Quantity (kg)	Value (Rs.)	No. of Farmers									
Bio fertilize	ers												
	Vermicompost	99188.4	589250	886	115227.3	179364	257	123130	719040	44	337545.7	1487654	1187
	Azolla	230	0	32	0			300	9000	20	530	9000	52
	FYM	0	0	0	0			50			50		
	BGA	120	0	5	0			0			120		
	Bio-gas Slurry, Vermiwash				15	0	0	0			15		
Bio Prestici	ide												
	Neem extract				0			163.5	21285	176	163.5	21285	176
	Metarhizium Anisopliae							11.2			11.2		
	Sl NPV							4.2	630	12	4.2	630	12
	Ha NPV							559.9			559.9		
Bio fungici	de												
								640.2	80260	1090	640.2	80260	1090
Total		99538.4	589250	923	115242.3	179364	257	124859	830215	1342	339639.7	1598829	2522
Bio agents													
	Trichoderma chilonis				0	0	0	642	3210	62	642	3210	62
	Chrysoperla carnea				102.4	10024	45	205	2460	20	307.4	12484	65
Earthworm	l												
	Euclnia uginae				0			0			0		
	Eisenia foetida				41000	24900	193	11400	10700	37	52400	35600	230
Earthworm culture					1000	0	2	0			1000	0	2
Total					42102.4	34924	240	12247	16370	119	54349.4	51294	359

5.4 LIVESTOCK PRODUCT

In order to provide quality livestock materials to the farmers, KVKs engaged in production and supply of livestock strain, poultry chicks, eggs, piglets, fis fingerlings, spawn etc. Total quality of livestock material produced was 1259993 which was worth of Rs. 1316567. Out of the total production 262375 was livestock strain, 118064 poultry strain, 117168 duck strain, 119059 piglets, 421157 fishfingerlings.

Table: Livestock production by the KVKs.

	AN	ISLAN	NDS		BIHAR		JHA	ARKH/	AND	WES	T BEN	GAL		Zone II	
Particulars of Live stock	Number	Value (Rs.)	No. of Farmers												
Cows				1	0	0	0	0	0	262374	75		262375	75	0
Buffaloes				3	15000		0	0	0	0	0		3	15000	0
Calves				6	3500		0	0	0	70000	6		70006	3506	0
Others (Pl. specify)				50	25000		0	0	0	0	0		50	25000	0
Poultry				1000	45000		0	0	0	117064	294		118064	45294	0
Broilers					521136		0	0	0	32000	7		32000	521143	0
Layers				0	0		0	0	0	9200	25		9200	25	0



	AN	ISLAN	NDS		BIHAR		JH	ARKH/	AND	WES	T BEN	GAL		Zone II	
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	Number	Value (Rs.)	No. of Farmers
Duals (broiler and layer)				100	0		0	0	0	5300	35		5400	35	0
Ducks	50		5	23	2450		50	20000	10	117045	686		117168	23136	15
Others	200	600	16	50	300		0	0	0	5480	51		5730	951	16
Chicks				77	3375		0	0	0	0	0		77	3375	0
Piggery				0	0		19	28635	6	64000	0		64019	28635	6
Piglet				0	0		59	150345	9	119000	57		119059	150402	9
Fisheries				0	40000		0	0	0	0	0		0	40000	0
Indian carp (Fingerling)	5000	5000	20	4250	328665		15600	58690	5	396307	575		421157	392930	25
Exotic carp				0	0		0	0	0	2400	0		2400	0	0
Ornamental Fish				0	0		0	0	0	9350	50		9350	50	0
Goat				0	0		15	67000	13	23920	10		23935	67010	13
Total	5250	5600	41	5560	984426	0	15743	324670	43	1233440	1871	0	1259993	1316567	84

6. SOIL AND WATER SAMPLE ANALYSIS

S oil, water and plant analysis was carried out by the KVK (53) of Zone-II in their soil and water testing lab provided to them. A total of 29974 samples were analyzed by the KVKs which benefitted 22171 farmers spread over 2176 villages. An amount of Rs.863956 was realized by the KVKs during the year. The number of samples analysis

was increased over the years. This indicates that farmers of the districts are well aware of the soil testing programmes of the KVK and they are taking interest in getting soil and water analyzed by the KVKs. A nominal charge is taken from the farmers to maintain the facilities.

Samples	No. of Samples	No. of Farmers	No. of Villages	Amount realized (Rs.)	No. of KVKs
A&N ISLANDS					
Soil	46	29	10		1
Water	36	25	9		4
Plant	21	12	5		1
Total	103	66	24		6
BIHAR					
Soil	17446	11013	1418	423570	25
Water	52	26	5		1
Total	17498	11039	1423	423570	26
JHARKHAND					
Soil	7970	6954	500	315310	12
Total	7970	6954	500	315310	12
WEST BENGAL					
Soil	4234	3999	197	121130	15
Water	169	113	32	3946	4
Total	4403	4112	229	125076	19
Total (Zone II)					
Soil	29696	21995	2125	860010	49
Water	257	164	46	3946	5
Plant	21	12	5		1
Total	29974	22171	2176	863956	55

Table : Soil and water testing by KVKs in different states



7. SCIENTIFIC ADVISORY COMMITTEE

S cientific Advisory Committee meeting is organized for by the KVKs every year to finalize the action plan of the KVK. During the year, 76 SAC meetings were conducted out of 83 KVKs of Zone-II. Apart from University authorities, NABARD, different line departments, ATMA, Farmers AIR, Doordarsan, Lead Bank also participated in these meetings a total of 2425 participants were present in these Scientific Advisory Committee meetings. Zonal Project Director or his representative attended the meetings.

Statewise data on 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 & Nicobar Islands all the 3 KVKs successfully organized SAC meetings.

Table: State wise SAC meeting conductedby 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

8. PUBLICATION BY KVKS

P ublication of the research work in the form of research paper, technical bulletins, technical reports and various other means like leaflets, pamplets etc. was one of the activities of the Krishi Vigyan Kendra during the year 2014-15. KVKs of Zone-II published 109 research papers, 135 popular articles, 454 extension literatures, 239 technical bulletins and reports, 25 CDs and some other type

Table: Publication in KVKs in Zone II

of publications. In total 1141 number of publications were brought out by the KVKs during the year. The publications are circulated among government departments, ATMA, SAUs and also sold to the public during exhibitions etc. Total circulation during the year was 316337 .Eleven (11) news letter was also published by the KVKs regularly on quarterly or annual basis.

Item	B	IHAR	JHARKHAND WEST BENGA		BENGAL	A&N ISLANDS		TOTAL		
	Number	Circulation	Number	Circulation	Number	Circulation	Number	Circulation	Number	Circulation
Research paper	37		26		42		4		109	
Seminar/ Conference/ symposia papers	22				4				26	
News Letter	35	17550	12	12000	11	180			58	29730
Popular Articles	45	40348	85	4700	5				135	45048
Book Chapter	43	15052	20	2000	32	3221			95	20273
Extension Pamphlets/ literature	208	118030	113	39205	118	34417	15	450	454	192102
Technical Reports and bulletines	52	12021	125	9010	56	1350	6	120	239	22501
Electronic Publication (CD/ DVD etc)	5	6600	4	25	16	58			25	6683
Total	447	209601	385	66940	284	39226	25	570	1141	316337

Table: Publication in KVKs of Zone-II

Category	Number of KVKs	Number
Research Paper	29	109
Technical bulletins	13	48
Technical reports	26	191
Others (pl. specify)	56	793
Total	124	1141
News Letter	11	14



9. TECHNOLOGY WEEK

C elebration of technology week has provided the KVKs a much needed platform to bring a number of stakeholders like farmers, extension agencies, dealers, researchers and others under a single umbrella. Almost all the KVKs celebrated technology week in collaboration with private organizations (PPP mode) to make the farmers and other stakeholders aware of the fast changing agricultural scenario of the country. 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. The programmes were organized in planned manner to expose the farmers towards improved package of cultivation as well as to interact with researchers, extension personnel and others besides among themselves. The KVKs observed technology week with a view to popularize modern farm technologies and at the same time educate various stakeholders about scientific farming. During the year 2014-15 as many as 78 KVKs observed technology week by organizing suitable programmes. In total 875 activities were organized benefitting 176127 farmers and stakeholders.

Types of Activities	Bihar (38)		Jharkhand (22)		West Bengal (18)		Total (78)	
	No. of Activities	No. of Participants						
Gosthies	11	1416	22	1688	39	41752	72	44856
Lectures Organized	72	6691	84	2844	154	69348	310	78883
Exhibition	26	605	21	294	117	35943	164	36842
Flim Show	4	624	23	468	46	2737	73	3829
Seminar	27	1731	21	826	13	848	61	3405
Health Camp	6	469	0	0	0	0	6	469
Inaugural Function	1	82	1	44	0	0	2	126
Innovative Farmers Meet	0	0	4	150	2	48	6	198
Ex-trainees Meet	0	0	0	0	1	225	1	225
Krishi quiz	0	0	0	0	4	435	4	435
Cultural programmes	0	0	0	0	7	754	7	754
Demonstration	10	3019	24	2569	138	1654	172	7242
Group discussion	0	0	2	204	11	444	13	648
Others	4	15	0	0	20	1800	24	1815
Total	161	14652	202	9087	512	152388	875	176127

Table: Technology week celebration in different states

Figures in parentheses indicate no of KVKs

10. OTHER PROGRAMMES

10.1 RAWE PROGRAMMES FOR ARS SCIENTISTS

The programme is organized for the ARS trainees to acquiant the scientist probationers with KVK activities and also farming situations in the district level. These trainees are also brought to the Zonal Project Directorate for interaction with the scientists. During the year 2013-14, 260 ARS trainees were trained which involved 1089 trainee days.

Table: RAWE Programme organized

Name of the State	No. of student/ ARS trained	No. of days stayed
Bihar	74	939
Jharkhand	89	10
West Bengal	97	140
Total	260	1089



10.2 STUDY ON INCIDENCE OF LIVESTOCK DISEASES

The programme was started with collaboration with National Institute of Veterinary Epidemiology and Disease Informatics, Bengaluru last year. The same initiatives was continued during the year 2014-15. Prevelance of major diseases of cattle, their outbreak, loss and control measures were recorded in the state of Bihar, Jharkhand and West Bengal. Foot and Mouth diseases in cattle, PPR in goat, Black Quarter in cattle Ranikhet in poultry were the major diseases which recorded 70-80% loss. In Simdega, Jharkhand the 100% loss due to PPR in goat was recorded. A large number of vaccination programme was initiated. In Bihar, 29712, Jharkhand 2200, West Bengal 19667 animals were vaccinated taking the total figure to 51579.

Table:Vaccinationprogrammeagainstdiseases in lifestock

State	Number of animals vaccinated
Bihar	29712
Jharkhand	2200
West Bengal	19667
Total	51579

10.3 NEHRU YUVA KENDRA TRAINING

A few KVKs of Bihar and Jharkhand were involved in providing trianing to the volunteers of Nehru Yuva Kendra as per local arrangements. The training programmes were specifically meant for empowering the youths with adequate knowledge and skill in agri-based enterprises to make them self-employed. In such programmes seven KVKs of Jharkhand and eleven KVKs of Bihar were involved to train 948 number of volunteers in the areas of medicinal plants, mushroom cultivation, bee keeping, vermicompost production, protected vegetable cultivation, fruit and vegetable preservation etc. In the process of providing training the KVKs earned fund worth Rs. 518331/- from district NYK.

10.4 BSF PERSONNEL TRAINING

The activities of KVKs were not only confined to the benefit of farmers, youths and extension personnel but also extended to BSF personnel to make them aware of various production technologies. Three KVKs each from Bihar and Jharkhand provided training to 914 BSF persons on hitech agriculture, mushroom production, fruit cultivation, vermicompost production, animal husbandry and others. Moreover, the higher officials of BSF also interacted with KVKs on development activities in agriculture. It shows that the resources and expertise available with KVKs of Zone-II are well recognized among the army personnel also.

10.5 KVK IN RURAL SCHOOL

To make agriculture a dignified profession and respectful lievelihood option, children of tender age need to be exposed and taught about the importance of agriculture in survival of human kind. Unfortunately agriculture as a course curriculum is vet to find place in the primary and secondary level of education which keeps the young generation ignorant about agriculture. To make the students of primary and secondary level aware of the prospect and contribution of agriculture in our livelihood, KVKs of Zone-II took up sensitization programme for the school children during last year. In most of the cases, the KVKs approached the school authorities to allow special session in the school or to allow the students to visit KVKs to have first hand experience of agricultural activities. The KVKs, though mainly focussed on senstizing the students, also highlighted a number of practices like vermicompost production, animal management, improved farm implements etc. to influence the farmers through their children. Various form of a-z aids, banner, leaflets, flex etc. were suitably used alongwith live materials, models and other form.

10.6 SWACHH BHARAT ABHIYAN

As a part of social responsibility, Zonal Project Directorate and KVKs under Zone-II observed Swachh Bharat Abhiyan to keep the office surrounding, roads and locality free from garbage, debris and other obnoxious materials. The KVKs carried out the programme in the adjoining villages also to infuse the sense of cleanliness among the mass. A large number of awareness programmes was organized by the KVKs in the villages and the KVKs encouraged the villagers to keep their surroundings clean through their own efforts. A few KVKs organized rally with placards to sensitize the people about the importance of keeping clean from the nature and health point of view. KVKs also conducted gosthi, made farmers aware of utilizing waste through vermicompost production, trained about maintaining sanitation and hygiene in preparation as well as preservation of food at household level. The KVKs of Bihar conducted the abhiyan for 69 times, KVKs of Jharkhand for 37 times, KVKs of West Bengal for 88 times and KVKs of A&N Islands for 4 times.

10.7 CELEBRATION OF NATIONAL SCIENCE DAY

Implication of science in our day to day life was highlighted by the KVKs of Zone-II through observation of science day during last year. In this programme 914 persons from different walks of society actively took part and interacted among themselves to utilize science-based innovations for the improvement in quality of life. Apart from discussion, the KVKs explained the need for greater application of



science and technology in different agricultural practices like hi-tech agriculture, climate resilient agriculture and others.



Swachh Bharat Abhiyan



National Science Day

10.8 PROTECTION OF PLANT VARIETIES AND FARMERS' RIGHT (PPV&FRA)

The efforts of Protection of Varieties plant and Farmers' Rights Authority, Ministry of Agriculture, Govt. of India was substantially supported by the KVKs of Zone in creating large-scale among farmers, breeders and others towards

importance of identifying and preserving indigenous plant varieties. In collaboration with PPV&FRA, Zonal Project Directorate, Zone-II coordinated the programme carried out by thrity one KVKs of this zone apart from the centralized programme held at ZPD, Kolkata. Considering the significance of this noble cause, the KVKs planned their programme in phased manner to reach more number of farmers for which the venue was kept at blocks of the districts. The efforts of the KVKs enabled the farmers to easily bring their indigenous crops/varieties for its display at the place of the workshop. The programmes organized by the KVKs with the expartise of PPV&FRA, Ranchi office and Directors of Research, State Agricultural Universities created postive impact among the farming community to nurture local varieties for its preservation and taking up further research for its improvement.

Considering the possibility to get indigenous crop/ varieties, 11 KVKs from Bihar, 13 KVKs from Jharkhand and 7 KVKs from West Bengal were involved in PPV&FR programme. The KVKs, in turn, helped the farmers to identify 829 number of indigenous crop/varieties in last one year and for the registration of those varieties, 1288 number of registration forms could be filled up. However, so far registration of 664 crop/varieties could be materialized as in some cases, the SAUs are yet to send the filled in proforma and seed samples to PPV&FR Authority. State-wise details of crop/variety identified and application form completed are presented in the following Table.

Table: Details of crop/variety identified

Name of state	No. of crop/ variety identified	Application for registration completed
Bihar	200	318
Jharkhand	493	775
West Bengal	136	195
TOTAL	829	1288

11. PERFORMANCE OF RAINWATER HARVESTING STRUCTURE WITH MICRO-IRRIGATION SYSTEM

R ainwater harvesitng structure was established in KVKs where the rainfall was less in view to provide irrigation to the farm as well as to organize activities like fishery, plant material production etc. Training are also organized to the farmers to acquiant with the system. During the year

2013-14, 71 training programmes, 795 demonstrations were made and 169589 plant material was produced from the rainwater harvesting system. 12579 farmers and 428 extension officials visited the rainwater harvesting structures in order to know the benefits of the such system.

Table: Performance of rainwater harvesting structure

Zone	No. of	Activities conducted							
	KVKs	No. of Training programmes	No. of Demonstration s	No. of plant materials produced	Visit by farmers (No.)	Visit by officials (No.)			
II	17	71	795	169589	12579	428			


- 12. TECHNOLOGICAL BACKSTOPPING BY -Directorates of extension education

 ${f Q}$ ased on the problems of farmers'field, KVKs use D to undertake different activities either in the form of On Farm Trial (OFT) or Front Line Demonstration (FLD) or through organizing various training programmes / health camps / on-hand training etc. The KVKs of this zone disseminated latest technologies derived from State Agricultural / Animal Science Universities / ICAR Institutes to the end users under the technological and administrative support of Directors of Extension Education (DEE). All 83 KVKs of this zone were distributed under the jurisdiction of six DEEs irrespective of any host organizations of the KVKs for efficient transfer and use of technologies. Out of which the Directorate of BAU-Bhagalpur was allotted with 25 KVKs, RAU-Pusa with 13 KVKs, BAU-Ranchi with 24 KVKs, UBKV-Pundibari with 5 KVKs and remaining to BCKV (16 KVKs). During the year 2014-15, KVKs of Zone II were benefited from the DEEs in many aspects. Supply of seeds, planting materials, livestock and poultry breeds including products, bio-products, package of cultivation practices for various crops, vegetables, management practices of livestock and poultry, printed literatures, organizing HRD training for KVK personals were the few examples.

To improve the skill of KVK persons for easy transferring of recent technologies available at the institutes and to enhance the adopting capabilities of end users, during 2014-15, the Directorate of RAU-Pusa organized 4 meetings / workshops on hi-tech horticulture, ICT in agriculture etc. involving total 48 KVKs. The Directorate of BAU-Bhagalpur conducted 11 programmes covering the area of entrepreneurship development, commodity future market, post-harvest management and food processing, financial and account management etc. with 245 KVKs, whereas, BAU-Ranchi involved 128 KVKs from their jurisdiction in 8 meetings which covered mainly production of quality animal products, frontier fish farming, quality seed production, soil health management techniques, climate resilient agriculture etc. The Directorate of BCKV-Mohanpur and UBKV-Pundibari organized 6 and 2 programmes for 32 and 10 KVKs, respectively. The integrated farming approach, skilled manpower development for agriculture, capacity building on commodity future market and others were the predominant areas covered under the trainings. Two trainings were conducted by UBKV-Pundibari involving 10 KVKs.

Throughout the year, the DEEs and their officials visited KVKs for 270 occasions in different programmes like SAC meeting, field day, technology week, training programme, workshop / seminar organized by KVKs, interaction meeting, Kisan / Krishi Mela, monitoring interventions and so on. The DEE of Jharkhand state visited the KVKs

for 66 times and DEEs of Bihar state for 80 times (BAU-Bhagalpur 63 and RAU-Pusa 17) in the year 2014-15 for the above mentioned purpose. As per the visits under West Bengal state, and Andaman & Nicobar Islands Union Territory were concerned, a total of 124 visits (BCKV-98 and UBKV-26) were performed by the concerned Directorates.

The overseeing of KVKs activities is one of most important responsibilities of DEEs to assess the technological needs of KVKs and to make the KVKs empowered with knowledge and skill. During 2014-15, the DEE officials of RAU-Pusa visited their OFT and FLD fields for 5 occasions each to follow up the case for controlling pot borer infestation in red gram, weed infestation due to meager rainfall, for uplifting backyard poultry farming and others. The Bhagalpur officials visited 7 times for OFT fields and 10 times for FLD fields to oversee the activities. A total of 26 times and 32 times were visited by DEE-Ranchi to inspect OFT and FLD fields, respectively besides 6 times visit for exhibitions/fairs and farmerscientists interface meet. The DEE of WBUAFS-Belgachia inspected the ecofriendly technology development for rice and brinjal, socioeconomic development of forest villages, performance of Vanaraja and Khaki Campbell duck which were included in their OFTs and FLDs. The officials visited 7 times each in addition to their visit for on-station-trials/ testing (4 times) and project implementations (6 times). The directorate of UBKV inspected their OFT fields for 33 times to supervise the growth of paddy fields and others. The officials of BCKV also visited OFT and FLD fields for 6 and 20 times, respectively.

During the period of report, all the Directorates published technology inventories to increase crop / livestock / fish production. In addition, some of the Directorates also published a good number of newsletters, technology bulletins, magazines in English as well as local languages covering in many aspects for the benefit of farmers.

The updated technologies and technological products related to the production of seed (paddy, wheat, rai, toria, pea, gram, vegetables etc.), production of planting materials (mango, guava, litchi, amla etc.), biological products (vermicompost, rhizobium culture etc.), livestock breeds (Black Bengal goat, Bonpala sheep and Ghoongroo pig etc.), poultry breeds (RIR, Vanaraja, Haringhata Black etc.), Mushroom, fish spawn and many others were provided to the KVKs by almost all the Directorates ultimately for making availability to the farming community of Zone II during the year 2014-15. As per State was concerned, the Directorate of Bihar supplied their various technological products to 117 KVKs, Jharkhand to 60 KVKs and West Bengal to 26 KVKs in the year 2014-15.



13. AGRICULTURAL TECHNOLOGY INFORMATION CENTRE

Information gricultural Technology Centre (ATIC) is a 'single window' system for delivering updated technologies available at the research institutes/ universities related to agriculture and allied sectors to the end users. The ATIC is being operated in the state of Bihar, Jharkhand, West Bengal and Union Territory of Andaman & Nicobar Islands under Bihar Agricultural University-Rajendra Agricultural University-Pusa, Bhagalpur, Birsa Agricultural University-Ranchi, Bidhan Chandra Krishi Viswavidyalaya-Mohanpur, Uttar Banga Krishi Viswavidvalava-Pundibari and Central Island Agricultural Research Institute-Port Blair.

The ATIC has the facility of reception counter, exhibition / technology museum, touch screen Kiosk, cafeteria, sales counter, farmers' feedback register, community radio station etc. During the year 2014-15, ATICs were visited by 13531 farmers of Zone II. Out of which 8106 farmers visited for collecting technology information, 2180 for technology products and 3245 for other purposes.

As per technology information was concerned, a total of 5457 farmers used Kisan Call Centre to enquire various information related to agriculture and allied sectors. The majority of farmers enquired information on disease management of various crops (1363), followed by information on pest management (1101), animal husbandry and fishery (740), soil and water technology (693), varieties / hybrids (648), agrotechniques (462), and post-harvest technology and value addition (450). About 550 farmers of Zone II got the benefit from video showing in the ATICs. The queries of 11 farmers were also met out by sending letters. The ATICs of this zone were used for the training of 1889 farmers/ technocrats/ students. A total of 241 farmers used helpline numbers and emails for getting various information on agriculture, animal husbandry and fishery related matters. The Kisan Gyan Rath was also used as a mean to solve the queries of 42000 farmers of Zone II.

The knowledge of farmers' and other stakeholders were also enriched providing various types of publications either in the form of books, technical bulletins, CDs, Kisan Samachar etc. Sometimes, it was supplied / sold in minimum prices and sometimes in free of cost from the ATICs of Zone II. During the year 2014-15, from ATICs 12717 copies of books were sold to 12977 farmers which helped to earn a substantial amount (9.74 lakh) of revenue. Among other print and electronic materials, 455 CDs and 594 technical bulletins were sold to the farmers from ATICs in addition to the free distribution of 20000 KisanSamachars and 16000 other publications.

The technological products like seeds, planting materials, livestock, poultry, bio-products etc.are being supplied to the farmers through this single window system. During 2014-15, a total of 11341 quintals seed, 932611 planting materials, 1100 pigs, 26000 poultry birds, 767 quintals bio-products, 89923 packets bio-fertilizers and 89 quintals vermicompost materials comprising a worth of more than Rs. 5.55 crore were made available for farmers of Zone II. From ATICs, 20918 farmers got benefit of technological products.

The ATICs also provided the service of soil and water testing facility, plant disease diagnostics facility, information about services available with different state line departments, and various campaigning programmes of Kharif and Rabi seasons launched by the State Governments. During the period of report, with the help of ATICs, 9144 farmers analyzed their soil samples and 768 farmers got their plant samples diagnosed besides getting other information related to agriculture and allied sectors from the state line departments.

14. HRD ACTIVITIES

I CAR-Zonal Project Directorate Zone II organized number of human resource development programmes in collaboration with Director of Extension Education of SAUs, ICAR Institutes, NABARD, World Bank, FAI, PPVFRA, NICRA and others during the year 2014-15. A total of 1033 persons were participated in 27 different programmes. The details of programmes organized are given the table.

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

Sl. No.	Title of the Programme	Organized at	Date	No.of Participant
1	State Level Workshop for the KVKs of WB and A & N Islands	ZPD, Zone-II Kolkata	04.04.14- 05.04.14	44
2	Annual zonal Workshop of KVKs of Bihar, Jharkhand, WB & A& N Islands	NIRJAFT, Kolkata	02.06.14- 03.06.14	132

Annual Report 2014 - 15

ICAR-ZPD II



Sl. No.	Title of the Programme	Organized at	Date	No.of Participant
3	Road map for fisheries research & development in West Bengal	ZPD, Zone-II Kolkata	21.06.14	16
4	Action plan and budget for NICRA for the year 2014-15	ZPD, Zone-II Kolkata	07.07.14	20
5	Review meeting on current monsoon situation of WB	ZPD, Zone-II Kolkata	14.07.14	24
6	86 th ICAR Foundation Day celebration	ZPD, Zone-II Kolkata	16.07.14	80
7	Interactive meeting for Identification and Documentation of the Technologies in WB and A&N Islands	ZPD, Zone-II Kolkata	19.07.14	30
8	Meeting for finalization modus operandi of World Bank aided project WBADMI	ZPD, Zone-II Kolkata	16.08.14	37
9	Meeting for Technology Profile for Fisheries of West Bengal and Andaman & Nicobar Islands	ZPD, Zone-II Kolkata	22.08.14	08
10	Meeting on FMS/MIS project	ZPD, Zone-II Kolkata	22.08.14	14
11	Orientation for the ARS probationers	ZPD, Zone-II Kolkata	23.08.14	12
12	Workshop on writing success story	ZPD, Zone-II Kolkata	27.08.14- 29.08.14	40
13	Workshop on PPV & FR of Zone-II	ZPD, Zone-II Kolkata	15.10.14	32
14	Meeting on Discussion and preparation of vision 2050	ZPD, Zone-II Kolkata	05.11.14	15
15	Review Workshop on NICRA & NE Trial (IPNI)	ZPD, Zone-II Kolkata	21.11.14- 22.11.14	23
16	Training programme for newly recruited PCs from other Zones	ZPD, Zone-II Kolkata	06.12.14	15
17	Finalization RE meeting 2014-15	ZPD, Zone-II Kolkata	15.12.14	34
18	Programme on "Sustaining soil health through balanced Fertilization need for reference in Fertilizer policy" in collaboration with FAI, ER, Kolkata	ZPD, Zone-II Kolkata	09.01.15	40
19	Meeting with PCs of KVKs for showcasing of exhibits at KVK Gurgaon	ZPD, Zone-II Kolkata	03.02.15	17
20	Training Programme of Assistant of KVKs under Zone-II	ZPD, Zone-II Kolkata	11.03.15	35
21	State Level Workshop of WB KVKs	ZPD, Zone-II Kolkata	07.04.15	35
22	State Level Workshop of Jharkhand KVKs	Deoghar, KVK	09.04.15	53
23	State Level Workshop of BAU, Bhagalpur KVKs	BAU, Bhagalpur	18.04.15	78
24	Zonal Workshop on NICRA	ZPD, Zone-II Kolkata	23.04.15- 24.04.15	35
25	State Level Workshop of RAU, Pusa KVKs	RAU, Pusa	28.04.15	28
26	Meeting with Director Research, SAU of Zone-II	ZPD, Zone-II Kolkata	22.05.15	14
27	Zonal Level Training cum Workshop of KVKs under Zone-II	CIFRI, Barackpore	26.05.15- 27.05.15	122
	Total			1033

15. REVENUE GENERATION

The KVKs of Zone-II have attracted funds from a number of organizations/project implementing authorities of State Department of Agriculture, Animal Husbandry and Fisheries, Central Government as well as organizations like ATMA, NABARD, RKVY, NGOs, MNREGAS, NHM and others who depend on KVKs for fulfilment of their mandate through the technical expertise of KVKs. Through sponsorship from different organizations, KVKs earn a substantial amount of revenue for its use for the development of agriculture and allied sectorial activities. During the year 2014-15, the KVKs of Zone-II generated a total sum of Rs.166.98 lakh through IFS model, poly house, green house, vermicomposting, demonstration unit etc. Among all KVKs of Zone-II, Bihar generated 44.95 lakh followed by Jharkhand (14.93 lakh), West Bengal (10.68 lakh) and Andaman and Nicobar Islands (0.22 lakh). This clearly indicates the potentiality of KVKs to attract different agencies for agricultural

development in the district. The details of revenue generated by the KVKs of Zone II are shown in table.

Table: Status of Revenue generation KVKsof Zone-II

Name of the KVK	Amount (Rs.)
A & N Islands	
Nicobar	22894
Total	22894
Bihar	
Bhagalpur	877611
Jamui	1360000
Jehanabad	39000
Kaimur	615282
Katihar	40135
Khagaria	68173
Kisanganj	37200
Madhubani	18861
Muzaffapur	26200
Rohtas	997000
E. Champaran	50000
Seohar	12000
Vaishali	354150
Total	4495612

Name of the KVK	Amount (Rs.)
Jharkhand	
Dhanbad	111000
E. Singhbhum	146822
Godda	409384
Gumla	510200
Palamu	192500
Sahibganj	123750
Total	1493656
West Bengal	
Birbhum	65,500.00
Burdwan	766305
D. Dinajpur	390860
Howrah	2,45,000
Jalpaiguri	580000
Narendrapur	1622600
South 24 pgs	5839157
U. Dinajpur	1177020
Total	10686442
Grand Total	16698604

16. NATIONAL FARMERS' PORTAL

he mKisan SMS Portal for farmers enables all f L Central and State government Organizations in agriculture and allied sectors to give information/ services/Advisories to farmers by SMS in their language, preference of agricultural practices and location. As part of agricultural extension (extending research from lab to the field), under the National e-Governance Plan -Agriculture (NeGP-A), various modes of delivery of services have been envisaged. These include internet, touch screen kiosks, agri-clinics, private kiosks, mass media, Common Service Centres, Kisan Call Centres, and integrated platforms in the departmental offices coupled with physical outreach of extension personnel equipped with pico-projectors and hand held devices. However, mobile telephony (with or without internet) is the most potent and omnipresent tool of agricultural extension. As per TRAI data of May, 2014, though there are about 38 crore mobile telephone connections in rural areas, internet penetration in the countryside is still abysmally low (in single digit percentage). Therefore, mobile messaging is the most effective tool so far having pervasive outreach to nearly 8.93 crore farm families.

The portal can be accessed at ww.mkisan.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. The Zonal Project Director as ADMIN also activates the registration requests from KVKs of this zone.

During the year 2014-15 a total of 12729 messages were sent to 31616656 farmers. The details of which could be viewed through dash board of the portal.





Dashboard of SMS sent

Table: Statewise distribution of SMS advisories and number of beneficiaries during 2014-2015

Sl. No.	State	No. of Advisory Sent	No. of Beneficiaries
1.	Andaman & Nicobor Islands	42	18888
2.	Bihar	7569	12179548
3.	Jharkhand	2817	16876467
4.	West Bengal	2301	2541753
Total		12729	31616656



17. TRIBAL SUB-PLAN (TSP)

uring the year 2014-15, the Zone II received Rs. 286.16 lakhs under Tribal Sub-Plan. As per the guidelines of the Council the fund was allocated to 63 KVKs. The scheme was implemented directly for the individual or families belonging to the Scheduled Tribes for developing agriculture including its allied sectorial activities i.e. dairy development, animal husbandry, fish production, irrigation, vocational training, etc. During the period under report the KVKs conducted on-farm training (OFT) on 42 technologies through 85 trials and conducted 476 front line demonstration (FLD). A total of 55736 tribal farmers took part in different extension activities and 12135 tribal farmers were trained in different scientific farming practices. Under this scheme, KVK produced 23.42 tonnes of improved variety seed, 2.20 lakh planting materials and 5256 fingerlings. A total of 179588 tribal farmers were benefitted through SMSs related to agricultural farming.



Fable: Perforn	nance	of KVK	s unde	r TSP d	uring	2014-	15								
	Pakur	Giridih	Palamau	Saraileka	Gumla	Dumka	Sahibganj	Godda	P. Medinipur	Port Blair	Ranchi	Simdega	W. Singbhum	Lohardaga	Total
OFT	7	1	7	4	15	2	9	4	n	7	10	0	8	11	85
FLD		2	100	100		100	6	11	12	ы	10	102	16	6	476
Farmers trained (in lakh)	0.02195	0.00021	0.0164	0.006	0.0023	0.01	0.0006	0.006	0.0001	0.00849	0.00004	0.0025	0.0259	0.02086	0.12135
Ext. per. trained (in lakh)	0.00205	0	0.004	0.0019		0.001	0	0.0008	0	0	0	0	0	0.0011	0.01085
Parti. in ext. (in lakh)	0.00078	0.00017	0.1755	0.008	0.0173	0.001	0.0004	0.02	0.00026	0.04591	0.02764	0.001	0.2551	0.0043	0.55736
Production of seed (in tonnes)	0.192	0	ம	0	1.853	10	0	2	3.5	0.0011	0	0	0.875	0	23.4211
Planting material produced (in lakh)	0.00475	0	0.08	0.012	0.0196	0	0.001	1	0.0195	0.05274	0.012	1	0	0	2.20159
Livestock strains and finger lings produced (in lakh)	0.00008	0	0	0	0.05	0	0	0.002	0.00048	0	0	0	0	0	0.05256
Soil, Water, Plant, manures samples tested (in lakh)	0.00156	0	0.0025	0.0015	0	0.002	0	0.01	0.00021	0.00045	0	0	0	0	0.01822
Mobile agro adv. (farmers)	0	0.00053	0	0.546	0	0	0	0	0	0.00039	0	0	0	1.24896	1.79588



- 18. NATIONAL INITIATIVE ON FODDER TECHNOLOGY Demonstration (NIFTD)

L ivestock is a major source of livelihood security for the poor in most of the part of the country. Apart from being an important source of human nutition, it is also a source of crop nutition, power for agricultural tillage and rual transplortation, livestock has a direct influence on agricultural production. In arid and semi-arid regions, livestock is the only source of livelihood, particularly when agriculture fails to withstand the drought. In our country, where more than 75 per cent farmers belong to small and marginal category, livestock is the main source of lielihood for a majority of rural population. The contribution of livestock to the National GDP is about 9% and 25% to agricultural GDP. Livestock is contributing about 15-20% to the household income of the farmers, which has steadily increased during recent years.

In spite of its importance in rural economy, production and supply of fodder has hardly been tried to improve. The economics of mik production is heavily dependent on the quantity of nutritious forage feed to milch animals with feeding of good quality forage, particularly leguminous fodder, feeding of concentrate can be reduced significantly which will help farmers earn substantial income from milk production as well as diversified milk products. Keeping in view the need to increase production of fodder and reduce the present demand-supply gap, a national initiative has been taken by Indian Council of Agricultural Research to accelerate production of fodder through promotion of comprehensive fodder production, conservation and utilization, develop seed and planting mateiral bank for forages for catering the requirements of their vicinity and create large-scale awarness among the livestock farmers for producing forage and fodder crops. As the nodal office of this initiative, Zonal Project Directorate has been continuously monitoring the cultivation of forage crops by 90 identified KVKs of the country including 14 in this zone. Based on the action plan developed for all the 90 KVKs, demonstration was conducted during 2014-15 with the seeds/ships supplied by IGFRI, Jhansi. In most of the cases, the demonstration programme performed sastisfactorily to motivate the farmers to go for fodder production in the non-traditional area where availability of land was a problem.

The performance of 14 KVKs involved in NIFTD indicates that the KVKs took up both demonstration and seed production programme during the period. The demonstrations were carried out under Technology Module I, II and III as per the suitability of crops in varied ato-ecological region. Crop-wise analysis of demonstration shows that maize as fodder crop (Var. African Tall) was

demonstrated by 13 KVKs under TDM-I i.e. forage production from arable land and 1 KVK took it under TDM II i.e. forage production from non-arable land. The KVKs conducted 55 demonstration to cover an area of 11.44 ha both in arable and non-arable land. In the process of demonstration, 60 farmers were involved. The maize variety as fodder was introduced by KVK Dumka of Jharkhand and both 24 Parganas of West Bengal for the first time in the respective districts. The average increase in yield was recorded in the range of 11.4 to 43.1 per cent. Sarghum (variety MP Chari) was demonstration in 5.58 ha through 51 programmes and involvement of 53 farmers. Out of 14 KVK, 11 took up the demonstration under TDM I and one KVK under TDM II.

The performance of demonstration indicated that increase in fodder yield could be obtained to the range of 8 to 28.6 per cent against the local varieties cultivated by the farmers.

Ricebean (var. Bidhan 2) was demonstrated by four KVK, under TDM-1 for an area of 1.8 ha. Altogether 32 demonstrations were conducted in this fodder crop involving 32 farmers. Increase in yield was achieved in the range of 15.4 to 32.9 per cent.

Berseem was taken up for demonstration by one KVK only with wardan variety. An area of 0.1 ha was brought under this demonstration through one programme and one farmers. The variety produced 12.3 per cent more yield than the local variety.

Demonstration in Bajra (var. Giant) was carried out by 9 KVKs of Bihar and Jharkhand for an area of 3.7 ha. Altogether 18 demonstrations were conducted in this crop and 33 farmers took part in the programme. Highest increase in yield (61.8%) was recorded in Jharkhand and the range of increase in yield was to the extent of 13.5 to 61.8 per cent.

Subabool was demonstrated by four KVKs but except in Jharkhand, yield could not be obtained due to poor germination and flood. In Jharkhand, 16.6% increase in yeild was recorded with K636 variety.

No result could be obtained from the demonstration conducted on stylo with BG-2 variety. The crop was demonstrated by seven KVKs under TDM-I, TDM-II and TDM-III. But poor germination and heavy rainfall after the sowing of the crop toally damaged the yield.

Leucaena, *S. seabrana*, Sudan, Cenchrus and Azolla were also demonstrated by KVKs of Zone-II but no significant result could be obtained exept in West Bengal where



Sudan produced and average demonstration yield of 526 q/ha and Azolla 320 q/ha. It as a new introduction in South 24 Parganas with Sudan fodder.

In demonstrating cow pea (var. UPC 622, UPC 628 and EC-4216), thirteen KVKs planned their programmes to cover 5.75 ha area through 86 programmes. The participation of farmers was to the extent of 92 in number. In respect of A&N Islands, it was a new introduction which fetched 247 q/ha average demonstration yield. In the zone as a whole, the increase in yield was in the range of 10-74 per cent the highest was recorded in Bihar.

Guinea was demonstrated by seven KVKs of Bihar and Jharkhand with BG 1 and BG 2 varieties. For Chatra, it was new introduction which fetched average demonstration yield of 355 q/ha. The average increase in yield was recorded to the extent of 4 to 31 per cent.

Hybrid Napier (var. CO 3, BHJ-6 and IGFRI-10) was taken up for demonstration by ten KVKs of this zone. An area of 2.3 was covered through 83 demonstratons and involvement of 62 farmers. Excedpt in Chatra, the demonstration performed fairly well with yield increase to the range of 15 to 42 per cent. It was a new introduction for Bhojpur, Port Blair, Gumla and Jalpaiguri also. BD-1 and BD-2 varieties selected for demonstrating Dinanath crop produced as high 385 q/ha against the local check of 150 q/ha. However, in most of the cases it was a new introduction.

Apart from demonstration programme, the KVKs took up seed/ship production programme also in the KVK farm to make quality seed and planting manerials to the farmers. The KVKs produced seeds and ships of all the demonstrated crops to establish seed bank in the KVKs. The higest yield recorded in maize was 20.2 q/ha, in sorghum 340 q/ha, in cowpea 200 q/ha and in hybrid hapier, 195 q/ha. The seeds were preserved in air tight plastic containers for its use in the next season.

National initiative on Fodder Technology Demonstration provided on opportunity to the KVKs to assess the aptability of various forage crops in this zone as well as acceptability of fodder among the farmers. The results obtained were by and large satisfactory though in some cases non-germination of seeds and flood were the difficulties faced by the farmers. Nevertheless, the farmers accepted most of the fodder crops and it is expected that the performance of the demonstration will influence more number of farmers to take up fodder cultivation for the development of livestock sector of this zone.

19. NATIONAL INNOVATIONS ON CLIMATE RESILIENT AGRICULTURE (NICRA)

B oth short and long term outputs are expected from the project pertaining to natural resource management, new and improved stress tolerant varieties of crops, livestock breeds, management practices that help in adaptation and mitigation and inputs for policy making to mainstream climate resilient agriculture in the developmental planning. Under Technology Demonstration Component, 15 KVKs of the Zone are involved in carrying out the project in the climatic vulnerable districts. Two more districts from the zone are also included from this year for implementing the activities in various interventions.

NATURAL RESOURCE MANAGEMENT

In-situmoisture conservation through resource conservation technology demonstrated in 15 NICRA adopted villages covering 391 farmers in 81.8 ha area. Water harvesting and recycling for supplemental irrigation were demonstrated in



NICRA adopted villages by the different KVKs involving 1070 numbers of farmers. Conservation tillage in wheat, paddy, lentil, pea and chickpea demonstrated in 15 NICRA adopted villages in an area of 231.2 ha of 395 numbers of



farmers. The technologies followed mainly by zero tillage operation. The results of the ZTD in various crops are presented in below table. Wheat with cultivation through ZTD showed maximum yield of 35-40 q/ha. Zero tillage technology showed very promising results in pulse and oilseed cultivation. Pea (var. Arkel) gave highest economic return among the pulse demonstration through ZTD. Artificial ground water recharge done by field bunding, water management and ground water recharge through SRI by sub soiler in paddy in the various adopted villages covering 64 ha area in 86 farmers fields. Ground water recharge through SRI by sub-soiler recorded highest paddy yield (54 q/ha) and benefit:cost ratio (2.23). Water saving





irrigation methods like sprinkler irrigation, LEWA in rice, RBF in brinjal, micro-lift irrigation in paddy demonstrated in 12 NICRA adopted villages covering an area of 71.1 ha in 310 farmers fields. There were 421 number of rainwater harvesting structures have been developed which could store 1130323 cu m of water. This intervention increased the cropping intensity to the maximum extent upto 425%. Kvk wise these structures along with storage capacity and increase in cropping intensity.

CROP PRODUCTION

Under crop production module introduction of drought resistant varieties of paddy, brinjal, niger, maize pigeon pea, and ragiwere demonstrated involving 2143 number of farmers in 533.29 ha area. Drought tolerant paddy varieties like Sahbhagi, Anjali, A-404, Naveen, Abhishek were demonstrated in 152.8 ha areas of 250 number of farmers' field, among which Sahbhagi with drum seeded



showed highest yield potential (45.5 q/ha) and economic return (B:C 2.65) with maximum increase (51.6%) as compared to local check.In the demonstrations under pulse and oilseeds, ICPL-858063, Mal-13 and PRG 153 varieties of pigeon pea gave the maximum economic return (B:C ratio of 3.95). Salt tolerant varieties of paddy like CARI Dhan-5, Usar Dhan-5, Jarava, Geetanjali, SR-26B, Amalmona were introduced in 66.5 ha area in



120 farmers' fields. Javarva, Geetanjali and Amalmona varieties proved maximum salt tolerant potential by giving highest yield of 45.0 q/ha and more economic return (BC ratio of 2.46). Flood tolerant varieties of paddy like Swarna sub 1 and Sabita were introduced through demonstration in 81.95ha area in 100 farmers' fields. Javarva, Geetanjali

and Amalmona varieties proved maximum salt tolerant potential by giving highest yield of 43.3 q/ha and more economic return (BC ratio of 2.57). To avoid terminal heat stress in crops like rice, wheat, lentil, mustard, potato, rajmash etc. were sown in 12 days advance (avg) during rabi season. These demonstrations were carried out in seven NICRA adopted villages involving 383 number of farmers' fields.Water saving paddy cultivation through SRI, short duration varieties, direct seeded rice, brown manuring etc. have been demonstrated over 212 ha area of 656 number of farmers' fields. Among all the interventions paddy cultivation with Sahbhagi variety showed highest



increase in yield whereas paddy cultivation with variety Rajendra Sweta with ZTD gave maximum economic return in the tune of BC ratio of 3.23. Delayed monsoon is now a common phenomenon in Bihar and Jharkhand districts of this Zone. To combat the situation one intervention of staggered community nursery for various crops of different crop duration and varieties has been promoted. Intervention on location specific intercropping was demonstrated in 77.3 ha area of 689 number of farmers' fields. Of all these maize + lady's finger was found most popular which was undertaken in 509 number of farmers fields although maximum return (B:C:: 8.64:1) was found in Chilli + lady's finger intercropping. Community nursery development of rice, cauliflower, brinjal, and tomato were demonstrated in 25.5 ha area of 190 numbers of farmers. Among all the demonstration the community nursery for cauliflower was the most promising one which showed highest increase in yield as well as economic return. Crop diversification through introducing new crops in prevailing cropping pattern was demonstrated in 122.1 ha area of 772 number of farmers' fields. Introduction of ol (var. Gajendra) in the cropping pattern. District is the most promising one which gave maximum economic return (B:C ratio of 6.04).

LIVESTOCK & FISHERIES

Community lands of an area of 164.5 ha involving 982 number of farmers utilized for different fodder production were demonstrated in eight different NICRA adopted villages. Berseem, oat, sudan chari, maize, hybrid napier were the major fodder produced in the programme. Of all these demonstration quality legume Sudan grass demonstrated in 25 number of farmers' fields showed maximum benefit return (B:C ratio of 6.0). Improved





fodder of rice bean and silage making were demonstrated in farmers fields. Silage making for 35 numbers of units showed very promising results.Various vaccination camps were organized against FMD of cattle, PPR against goat, Ranikhet of poultry, BQ vaccine, deworming etc. in 15 different NICRA adopted villages. Mortality rate reduce up to the extent of 100% and average increase in cattle milk yield upto 20% have been recorded after the vaccination camps organized. Composite and cat fish rearing in the



existing pond or in renovated pond were demonstrated in 140 farmers fields of NICAR adopted villages. Khaki Campbell duck was also introduced through this intervention. Demonstration of rural backyard poultry (kuroiler, Nicobari fowl), Khaki Campbell duck, T X D breed of pig, mineral mixture and azolla as cattle feed were carried out in 387 number of farmers fields. Improved ornamental bird was introduced through this intervention



which showed very promising results (B:C ratio of 6.4). Improved Poultry shed recorded low mortality rate and in shady area reduced heat stress. Standard spacing in improved shed resulted better performance in poultry and dairy animals. Interventions to reduce heat stress for higher survivability of backyard poultry and dairy animals were demonstrated of improved shelter.

INSTITUTIONAL INTERVENTIONS

Institutional interventions including seed bank, fodder bank, commodity groups, custom hiring for timely operations, community nursery raising, irrigation, collective marketing climate literacy through a village level weather station and awareness developed of 3386 number of farmers in the Zone.



VILLAGE CLIMATE RISK MANAGEMENT COMMI-TTEE (VCRMC)

Village Climate Risk Management Committee (VCRMC) was constituted after in-depth discussion with the villagers about the mitigation of the climatic vulnerabilities of the villages and the strategies to be 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 the village in consultation with the KVK.

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. Revenue generated through Custom hiring and under VCRMC in different KVKs were presented in the following table.

Table: Revenue generated through Customhiring Centres and VCRMC in KVKs

Name of KVK	Revenue gene	Revenue generated (Rs.)				
	From Custom Hiring Centres	Total under VCRMC				
Aurangabad	17385.00	54926.00				
Buxar	1700.00	26987.00				
Chatra	18560.00	59482.00				
Cooch Behar	7787.00	65632.00				
East Singhbhum	7700.00	25700.00				
Gumla	21370.00	62111.00				
Jehanabad	1000.00	51091.00				
Koderma	2460.00	20181.00				
Malda	4000.00	29751.00				
Nawada	5870.00	263552.00				
Palamu	12000.00	17400.00				
Port Blair	6955.00	20494.00				
Saran	9280.00	107370.00				
Supaul	1000.00	43324.00				
South 24 Parganas	3750.00	184962.00				
Total	120817.00	1032963.00				

CAPACITY BUILDING (HRD) PROGRAMME

A total of 552 courses were conducted by all NICRA implementing KVKs under Capacity Building Programme on various thematic areas benefitting 11381 farmers and farm women (9310 male and 2071 female) during the year 2014-15. Thematic areas covered on SRI, scientific crop management, crop diversification, land shaping, green manuring, natural resource management, resource conservation technology, animal feed management, nursery raising, pest and disease management, weed control, vermicompost, value addition, livestock management, oilseed and pulse demonstration, farm implements, drudgery reduction etc. The HRD programme conducted on the basis of priority area of farmers or farm women.

EXTENSION ACTIVITIES

NICRA implementing KVKs conducted a total of 2115 extension activities on various thematic areas benefitting





24301 practicing farmers and farm women (19402 males and 4899 females) during 2014-15. The extension activities were conducted on Method demonstrations, Agro advisory services, Awareness camp, Animal Health Camp, Krishak Chaupal, Kishan gosthi Resource conservation technologies, celebration field and farmers' days, diagnostic visits, group discussion, Technology week, Kisan mela etc.



CONVERGENCE BY NICRA WITH ONGOING DEVE-LOPMENT PROGRAMMES

Huge number of convergence programmes was carried out by each of the NICRA implementing KVK with ongoing development programmes or schemes during 2014-15. The prominent development schemes are NAIP, MGNREGA, National Micro and Minor Irrigation Scheme, Pradhan Mantri Gram Sadak Yojana, Chief Minister Sadak Yojna, Backward Rural Grant Fund, Silk Board, Sunderban Development Board, NFSM, IWMP, IVRI, PDADMAS, Forest Department, MESO, IAP Yojana etc. NICRA implementing KVKs being part of the different convergence programmes generated a handsome amount of Rs. 22,08,29,339/- during 2014-15.



20. INTERNATIONAL PLANT NUTRITION INSTITUTE (IPNI) TRIALS

TRIALS FOR NUTRIENT EXPERT® DECISION SUPPORT TOOLS FOR WHEAT SUPPORTED BY INTERNATIONAL PLANT NUTRITION INSTITUTE (IPNI)

N utrient Expert[®] Decision Support Tools, developed by The International Plant Nutrition Institute (IPNI), is an easy-to-use, interactive and computerbased decision support tools that can rapidly provide nutrient recommendations for individual farmers' field in the presence or absence of soil testing data. A trial was conducted during the Rabi season of 2014-15 by 23 Krishi Vigyan Kendras comprising of 10 from Jharkhand, 9 from Bihar and 4 from West Bengal. One KVK conducted the trial on maize. The trial was carried out with an objective to disseminate the Nutrient Expert® system for maize and wheat among the farmers of three eastern Indian states.

A total of 23 KVKs across three states of this zone have conducted the NE[®] trial funded by IPNI. These KVKs are Coochbehar, Dakshin Dinajpur, Jalpaiguri and Murshidabad of W.B.; Aurangabad, Bhagalpur, Bhojpur, Buxar, Jamui, Nawada, Madhepura, Saran and Sitamarhi of Bihar and Bokaro, Dhanbad, Dumka, East Singhbhum, Godda, Gumla, Hazaribag, Koderma, Pakur and Sahibganj of Jharkhand. The common experimental design for all implementing KVKs was:- (i) Group-I: Farmer's practice; (ii) Group-II: Application of recommended dose of fertilizers; and (iii) Group-III: Application of fertilizer doses as per the NE[®] tools developed by IPNI. The trials were conducted on wheat (by 22 KVKs), though few trials were also carried out on maize (1 KVK) during last Rabi seasonpre-dominantlyunder Rice-Wheat production system. The number of locations for the trial was restricted to 5 per treatment. The unique nature of this trial was that the individual farmer was provided with all the three technological options for his/ her plot(s). The data on various yield and soil health parameters, residue management etc. were collected for their further analysis in order of extension of the NE[®] for wheat/maize to be recommended for this zone. The results obtained some important parameters have been presented in the following table.

TRIAL ON WHEAT

West Bengal

The results obtained in four districts of West Bengal indicated that there was increment in the grain yield of wheat by using the fertilizer doses recommended by NE® of IPNI irrespective the varieties of the crop. It was also evident that the IPNI recommendation was the best across the districts. The overall increase in the yield in IPNI group was recorded at 27.1% over the farmers' practice in West Bengal.

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

Technology options			West Bengal (25)		
	Coochbehar (5)	Dakshin Dinajpur (7)	Jalpaiguri (8)	Murshidabad (5)	Avg. yield
Farmer's practice (FP)	25.8	29.4	26.5	30.3	28.0
Recommended dose of fertilizers (RDF)	29.5	31.1	33.1	31.6	31.3
Fertilizer doses as per the NE [®] (IPNI)	30.2	36.1	41.5	34.8	35.6

Figures in parentheses indicate the number of replication under each treatment

Jharkhand

The results obtained through trials made by 10 KVKs of Jharkhand showed that the application of fertilizer doses following the recommendations of IPNI yielded the best with respect to grain yield. There was gradual increase in the yield across the farmers' practice, recommended dose of fertilizer and the IPNI groups. The increment in yield was recorded to the tune of 41.3% in Jharkhand.

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

Tech.					Jharkl	1and (57)				
options	Godda (5)	Dhanbad (7)	Sahibganj (7)	Bokaro (8)	Hazaribag (5)	Dumka (5)	East Singhbhum (7)	Pakur (7)	Gumla (6)	Avg. yield
FP	26.0	22.7	23.5	25.6	33.1	41.2	20.1	29.1	21.2	26.9
RDF	34.7	33.9	26.2	30.5	43.5	45.0	25.5	34.0	28.6	33.6
IPNI	40.3	38.0	30.1	32.2	45.2	52.4	29.6	41.6	32.4	38.0

Figures in parentheses indicate the number of replication under each treatment.



Bihar

In Bihar, there were 9 KVKs selected for undertaking this trial. Out of these, 1 KVK (Madhepura) conducted trial on maize and others on wheat. The overall results of this trial

in Bihar indicated that there was highest increase in the grain yield in the groupusingfertilizer doses recommended by IPNI followed by fertilizer doses recommended by the state and use of fertilizer as per farmers' practice. The increment was found to be to the tune of 25%.

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

Tech.				I	Bihar (40)			
options	Bhagalpur (6)	Buxar (5)	Nawada (8)	Saran (5)	Aurangabad (5)	Sitamarhi (5)	Jamui (6)	Avg. yield
FP	27.3	25.6	37.4	34.8	29.6	32.0	29.9	30.9
RDF	31.1	26.4	36.7	41.8	35.9	32.6	35.6	34.3
IPNI	32.9	27.7	45.5	46.0	39.3	39.0	38.4	38.4

Figures in parentheses indicate the number of replication under each treatment

Overall findings of the NE[®] trial in this zone showed that the increase over the farmers' practice in average yield of wheat was 32.3% in the group using the fertilizer doses as per the IPNI and 17.2% in the recommended dose of fertilizer.



NE® trial on wheat

Table: Yield of wheat (q/ha) under differenttreatments in various states of Zone-II

Tech. options		Zone-II (1	.22)	
	Bihar (40)	Jharkhand (57)	West Bengal (25)	Avg. yield
FP	30.9	26.9	28.0	27.9
RDF	34.3	33.6	31.3	35.0
IPNI	38.4	38.0	37.9	35.6

Figures in parentheses indicate the number of replication under each treatment



IPNI – Wheat and maize trial

TRIAL ON MAIZE

One KVK of Bihar,*i.e.*, Madhepura conducted trial on maize using NE® system in five different locations. The results revealed that there was increment in the grain yield to the tune of 0.7% in the group IPNI doses, while the corresponding value for the recommended dose was - 6.1%.

Table: Yield of maize (q/ha) under different treatments in Bihar

Tech. options	Bihar (5)				
	Madhepura (5)	Avg. yield			
FP	70.7	70.7			
RDF	66.4	66.4			
IPNI	71.2	71.2			

Figures in parentheses indicate the number of replication under each treatment

CONCLUSION

From the present trial, it was evident that application of fertilizer as per the recommendation of the NE® system yielded the highest in terms of grain yield in all the districts under trial. This was also found that the increment in the grain yield in wheat ranged from 25% in Bihar to 41.3% in Jharkhand.





21. PUBLICATION OF ZONAL PROJECT DIRECTORATE

21.1 RESEARCH PAPERS

- C Jana, F H Rahman, S K Mondal and A K Singh. 2014. Management practices and perceived constraints in goat rearing in Burdwan district of West Bengal. *Indian Res. J. Ext. Edu.*, 14 (2): 107-110.
- Chandrahas, D S Malik, K S Das and A L Saini 2014. Effect of Sex and Number of Developing Foetus on Physiological Response in Crossbred Does. *Indian Journal of Animal Production and Management*, 30:43-47.
- D K Mishra, A K Verma, N Agarwal, S K Mondal and P Singh. 2014. Effect of dietary supplementation of probiotics on growth performance, nutrients digestibility and faecal microbiology in weaned piglets. Animal Nutrition and Feed Technology, 14: 283–290.
- D K Pandey, H K De and A D Upadhaya. 2014. Information sourcing and utilisation by fish farmers of Tripura State in north-east India. *Indian J. Fish.*, 61(3): 99-103.
- D K Pandey, H K De, B Hijam. 2014. Fish Farmers' perceived constraints in transfer of aquaculture technology in Bishnupur district of Manipur, India. *Int. J. Fish and Aq. Studies*, 2 (1): 1-4
- H K De and D K Pandey. 2014. Constraints to women's involvement in small scale aquaculture: an exploratory study. *Int. J. Agr. Ext.*, 2 (1): 81-88.
- H K De, D N Chattopadhyay, Radheyshyam G S Saha, A K Dash, T S Satpati and S Pal. 2013. Grow out carp polyculture by women a case study from Odisha. *Indian J. Ext. Edu.*, 49 (1&2): 78-82.
- K S Das J K, Singh G Singh and V. Nayan 2014. Haematological profiles of lactating Nili-Ravi buffaloes under heat stress alleviated condition during subtropical summer season. *Journal of Buffalo Sciences*, 3(3): 70-75.
- K S Das, G Singh, J K Singh, R Malik and P S Oberoi. 2015. Effect of heat stress amelioration on body weight changes, dry matter intake, milk yield and economics in lactating Nili-Ravi buffaloes during summer months under tropical climate. *Indian Journal of Animal Research* (Accepted).
- S Biswas, A K Singh and S K Mondal. 2014. Assessment of awareness generation and adoption of improved agricultural practices by ex-trainees of DakshinDinajpur of West Bengal, India. *Agric. Sci. Digest.*, 34(4): 277-280.

- S K Mondal and A Kumar. 2015. Genetic evaluation of preweaning growth traits in Landrace *xDesi* piglets. *Indian Journal of Animal Research*, 49(2):273-275
- S Kaswan, B H M Patel, S K Mondal, T Dutt, M R Verma, A K Verma and D Upadhyay. 2013. Effect of reduced floor space allowances on performance of crossbred weaner barrows. *Indian Journal of Animal Research*,1–7 (DOI:10.5958/09760555.20 15.00036.9).
- Singh Bharti, P P Pal and A K Singh. 2014. Commercial mushroom production in cooperative way. International Journal of Research, 1(7): 405-407.
- Sujit K Nath and H K De. 2013. Gender Role Appraisal in Rice Farming of Coastal Agro Eco-Systems in Eastern India. *Indian J. Ext. Edu.*, 49 (1&2): 11-14.
- V V Rijasnaz, S K Mondal and A Fahim. 2014. Effect of weaning on the postpartum reproductive performance of Murrah buffaloes. *Indian Journal of Animal Research*, 48 (5): 501–503.

21.2 TECHNICAL BULLETINS

- A Sarkar, A K Singh and P P Pal. 2015. Knowledge Networking in Agriculture and Outreach Challenges. In: A.K. Singh, J. Chauhan, R. Roy Burman and K. Sandhu (Eds.) Dynamics of Agricultural Extension Approaches, Biotech Books, New Delhi, India, pp: 125-132.
- B R Yadav, A K Srivastava, R K Tonk, N C Sahu, S K Biswas, S K Mondal and A K Singh. 2014. Occurrence of chromosome chimaerism in quadruplet calves born to a crossbred cattle cow. *NDRI News*, 18(2): 2.
- D Ghorai, S SKundu, S Sarkar and F H Rahman.2014. Location specific changes in SRI: Towards Augmented Paddy Productivity and Holistic Dimension in West Bengal. CRIJAF-KVK, Budbud, Burdwan, West Bengal.
- F H Rahman, H K De and P P Pal. 2014. Awardee Farmers. Zonal Project Directorate, Zone-II, ICAR, Kolkata, West Bengal.
- F H Rahman, S K Mondal, H K De, K S Das, S K Roy and P P Pal. 2014. ZPD-II: A profile. ICAR-Zonal Project Directorate, Zone-II, Salt Lake, Kolkata. 1-5.
- S K Roy, P P Pal, H K De, S K Mondal and F H Rahman (Eds.). 2014. Annual Report (2013-14), Zonal Project Directorate, Zone-II, ICAR, Kolkata, West Bengal.

21.3 BOOKS EDITED

- A K Singh, S K Mondal and K S Das (Eds.). 2015. *Krishi-Purbi Kiran*(In Hindi). ICAR-Zonal Project Directorate, Zone-II, Kolkata, pp: 1-108.
- A K Singh, S K Roy, P P Pal, S K Mondal, H K De, F H Rahman and K S Das (Eds.). 2014. KVKs in accelerated growth of agriculture in Bihar and Jharkhand. ICAR-Zonal Project Directorate, Zone-II, Kolkata, pp: 1-45.
- F. H. Rahman *et al.* 2014. Smart Practices and Technologies for Climate Resilient Agriculture. Pub. By CRIDA, Hyderabad.
- R Ramani, S Kumar, B P Bhat, M Variar, AArunachalam and A K Singh (2015). Jharkhand Agricultural Development Vision. ICAR-IINRG, Ranchi, pp: 1-80.
- Y G Prasad, M Maheswari, S Dixit, C Srinivasarao, A K Sikka, B Venkateswarlu, N Sudhakar, S Prabhukumar, A K Singh, AK Gogoi, A K Singh, Y V Singh and A Mishra. 2014. Smart practices and technologies for climate resilient agriculture. Book published by CRIDA, Hyderabad. pp: 1-76.

21.4 BOOK CHAPTERS/ CONTRIBUTION MADE IN COMPENDIUM

- A K Singh and P P Pal. 2015. Agri-preneurship for sustained livelihood of rural people in market driven agriculture. ISEE National Seminar on 'Extension innovations and methodologies for market-led agricultural growth and development' held at Rajmata Vijayraje Scindia Krishi Viswa Vidyalaya, Gwalior, 26-28 February, pp: 48-53.
- A Sarkar, A K Singh and P P Pal. 2015. Knowledge Networking in Agriculture and Outreach Challenges. In: A.K. Singh, J. Chauhan, R. Roy Burman and K. Sandhu (Eds.) Dynamics of Agricultural Extension Approaches, Biotech Books, New Delhi, India, pp: 125-132.
- F H Rahman *et al.* 2014. Compendium of 7th National Extension Congress – 2014 on 'Translational Research – extension for Sustainable Small Farm Development' organized by Society of Extension Education at ICAR RC for NEH, Umaiam, Meghalaya on Nov 8-11.
- F H Rahman, A K Singh, S K Mondal and H K De. 2014. Entrepreneurship development through preparation of jute diversified products and efficient marketing. In: Invited Lectures-and-Book of Abstracts of International Conference on Natural Fibres held at ICAR-NIRJAFT, Kolkata, 1-3 August, pp: 181.

- F H Rahman. 2015. Enrichment of compost and its prospect. Proceedings of Technology week – Adoption of technology for sustainable farming through 3R (Recharge, Reuse and Recycle) at N 24 Pags KVK, Ashokenagar, N 24 Pags, WB. Feb 24-26.
- H K De, S K Mondal and K S Das. 2015. Changing perspectives of rural aquaculture. In: Proceedings of Technology Week-2015 entitled, "Adoption of technology for sustainable farming through 3R" held at Ashokenagar, West Bengal, 24-26 February, pp: 17-22.
- K S Das, S K Mondal and H K De. 2015. Recharging soil fertility through livestock waste. In: Proceedings of Technology Week-2015 entitled, "Adoption of technology for sustainable farming through 3R" held at Ashokenagar, West Bengal, 24-26 February, pp: 30-34.
- M Chander, S Kumar, S K Mondal, R Mukherjee, R Rathore.
 2014. Organic animal husbandry development in developing countries: Challenges, contentious issues and opportunities. In: Rahmann G and Aksoy U (Eds.): Building Organic Bridges. Proceedings of the 4th ISOFAR Scientific Conference at the Organic World Congress 2014. 13-15 October 2014 in Istanbul, Turkey. Thuenen Report 20, Braunschweig, Germany, 659-662. (ISBN 978-3-86576-128-6; DOI: 10.3220/ REP_20_1_2014 urn:nbn:de:gbv:253-201407-dn053621-1)
- P P Pal, A K Singh and H K De. 2015. Book Chapter on 'Involving rural youths in farming-A suggested roadmap'. In: Book 'Family Farming and Rural Youth Economic Development'. Published by New India Publishing Agency, New Delhi, pp: 1-10.
- S K Mondal, K S Das and H K De. 2015. Recycling of farm wastes for sustainable livestock farming. In: Proceedings of Technology Week-2015 entitled, "Adoption of technology for sustainable farming through 3R" held at Ashokenagar, West Bengal, 24-26 February, pp: 13-16.
- S K Roy, F H Rahman and A K Singh. 2015. Fertilizer Use for Sustainable Agricultural Development in India. In: Souvenir of National Conference on Indigenous Innovation and foreign technology transfer in fertilizer industry: needs, constraints and desired simplification. ICAR-CRIJAF, Barrackpore, January 17: pp: 31.



21.5 LEAD PAPERS IN CONFERENCE/SYMPOSIA/ SEMI-NAR/OTHER FOR A

- S K Mondal, A K Singh, K S Das, F H Rahman and H K De. 2014. Role of farm level welfare measures in quality livestock production. In: Souvenir-cum-Lead Papers of Silver Jubilee Convention of ISAPM and National Seminar on "Revisiting management policies and practices for indigenous livestock & poultry breeds as eco-friendly economic producers", held at NAU, Navsari, Gujarat, 9-11October, pp: 250-255.
- S K Mondal, A K Singh, K S Das, F H Rahman and H K De. 2015. Contribution of livestock in livelihood security of small and marginal farmers. In: Souvenir cum Lead Papers of ISAPM National Seminar on "Livestock Production Practices for Small Farms of Marginalized Groups and Communities in India" held at Aizawl, Mizoram, 28-30 January, pp: 279-292.
- S K Roy, F H Rahman and A K Singh. 2015. Fertilizer Use for Sustainable Agricultural Development in India. pp31. Souvenir and Book abstracts 2015. National Conference on Indigenous Innovation and foreign technology transfer in fertilizer industry: needs, constraints and desired simplification. ICAR-CRIJAF, Barrackpore, 17 January.

21.6 ABSTRACTS PRESENTED IN NATIONAL/ INTER-NATIONAL SEMINARS ETC.

- A K Singh, K S Das, F H Rahman, H K De and S K Mondal. 2015. Effect of various control measures on predator incidence and production performance in lac insect (*Kerria lacca*). In: Abstracts of XII Agricultural Science Congress held at National Dairy Research Institute, Karnal, 3-6 February, pp: 36.
- A K Singh, N J Maitra and C K Mondal. 2014. Public-Private Partnership for crop diversification: Need of hour. Lead paper. National Symposium on Agricultural diversification for sustainable livelihood and environmental security, PAU, Ludhiana, 18-20 November.
- A K Singh, P P Pal and S K Roy. 2014. Client based extension for enhancing fodder productivity in eastern region. Lead paper. National Symposium on Climate resilient forage production and its utilization, BCKV, Kalyani, 13-14 November.
- A K Singh, S Dutta and S K Mondal. 2014. Dissemination of Nutrient Expert® System for wheat and maize in eastern Indian states. In: *Abstracts* of National Conference of International Plant Nutrition

Institute, held at Bangalore, 18-19 November.

- A K Singh, S Dutta and S K Mondal. 2014. Nutrient Expert[®]: Prospects of Improving Cereal (Wheat) Yields in Eastern India. In: *Abstracts* of National Conference of International Plant Nutrition Institute, held at Bangalore, 18-19 November.
- A K Singh, S K Roy and H K De. 2015. Horticulture development in Eastern region- Role of KVKs (In Hindi). Souvenir in Regional Agricultural Fair held at Patna, 19-22 February, pp: 21-26.
- A K Singh, S K Roy, H K De, NC Banik, F H Rahman, P P Pal and S K Mondal. 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. Uttar Banga Krishi Viswavidyalaya, Coochbehar, Apr 7-9.
- F H Rahman and A K Singh. 2014. Staggered paddy nursery as a contingency measures for delayed transplanting. Book of Abstracts. 79th Annual Convention of Indian Society of Soil Science. ANGRAU, Hyderabad, 24-27 November.
- F H Rahman and A K Singh. 2015. Combating Climatic Vulnerability in Indian Agriculture through Application of Improved Production and Risk Management Technologies. Compendium (ASC2015ABS1418116861): XII Agricultural Science Congress, Sustainable Livelihood Security for Smallholder Farmers. 3-6 February, ICAR-National Dairy Research Institute, Karnal, Haryana.
- F H Rahman, A K Singh, H K De, S K Mondal, K S Das and D Ghosh. 2015. Study on green technologies demonstrated in selected districts in Jharkhand. In: Fourth International Conference on "Management of sustainable livelihood systems" and Global Social Science Conference-2015 held at OUAT, Bhubaneswar, Odisha, India, 14-17 February, pp: 66.
- F H Rahman, A K Singh, S K Mondal and H K De. 2014: Entrepreneurship development through preparation of Jute diversified products and efficient marketing. Invited Lectures and Book of Abstracts. International Conference on Natural Fibres, NIRJAFT, Kolkata, 1-3 August, pp: 181.
- F H Rahman, A K Singh, S K Mondal, H K De and K S Das. 2015. Jute diversified products and efficient marketing. In: Abstracts of XII Agricultural Science Congress held at National Dairy Research Institute, Karnal, 3-6 February, pp: 240.



- F H Rahman, N J Maitra, S K Mondal, K S Das, H K De and A K Singh. 2015. Effect of application of different doses of fertilizers and organic manures on production of *boro*paddy. In: Souvenir and Book of Abstracts of National Conference on "Indigenous innovation and foreign technology transfer in fertilizer industry: Needs, constraints and desired simplification" held at CRIJAF, Barrackpore, West Bengal, 17 January, pp: 42-43.
- F H Rahman, S K Roy and AK Singh.2014. Technology dissemination for improved utilization of jute fibre. Invited Lectures and Book of Abstracts. International Conference on Natural Fibres, NIRJAFT, Kolkata, 1-3 August.
- F H Rahman, S Kumar, K S Das, S K Mondal and H K De. 2015. Effect of application of soil test based fertilizer along with micronutrients on paddy productivity. In: Souvenir and Book of Abstracts of National Conference on "Indigenous innovation and foreign technology transfer in fertilizer industry: Needs, contraints and desired simplification" held at CRIJAF, Barrackpore, West Bengal, 17 January, pp: 43.
- H K De and A K Singh. 2015. Institutional innovations for marketing of farm produces- KVK Experiences. ISEE National Seminar on 'Extension innovations and methodologies for market-led agricultural growth and development' held at RajmataVijayrajeScindiaKrishiViswaVidyalaya, Gwalior, 26-28 February, pp: 17-22.
- H K De, F H Rahman, S K Mondal, P P Pal, S K Roy and A K Singh. 2014. Scouting farm innovationshow important it is for extension. International Conference on Horticulture for nutritional, livelihood and environmental security in Hills:opportunity and challenges, Kalimpong, 22-24 May.
- K S Das, A K Singh, S K Mondal, F H Rahman, H K De, P P Pal and S K Roy. 2015. Intensification of livestock production for small holder and landless farmers. In: Abstracts of XII Agricultural Science Congress held at National Dairy Research Institute, Karnal, 3-6 February, pp: 272.
- P P Pal, H K De, A K Singh, S K Roy, F H Rahman, K S Das and S K Mondal. 2015. Farming-the means of women empowerment. In: Abstracts of XII Agricultural Science Congress held at National Dairy Research Institute, Karnal, 3-6 February, pp: 291-292.
- S Biswas and F H Rahman.2015. Influence of mode and

time of n application at different level through urea on n use efficiency of winter rice. Souvenir and Book abstracts: National Conference on Indigenous Innovation and foreign technology transfer in fertilizer industry: needs, constraints and desired simplification. ICAR-CRIJAF, Barrackpore, 17 January.

- S Biswas, A K Singh and S K Mondal. 2014. Assessment of awareness generation and adoption of improved agricultural practices by ex-trainees of DakshinDinajpur KVK, W.B. In: *Proceedings* of International Seminar on Integrating Agriculture and Allied Research: Prioritizing Future Potentials for Secure Livelihoods, held at Bidhan Chandra KrishiViswaVidyalaya, W.B., 6-9 November, pp: 265.
- S Biswas, P K Ganguly, S K Roy and F H Rahman. 2015. Influence of mode and time of N application at different level through urea on N use efficiency in winter rice. Pp50. Souvenir and Book abstracts 2015. National Conference on Indigenous Innovation and foreign technology transfer in fertilizer industry: needs, constraints and desired simplification. ICAR-CRIJAF, Barrackpore, 17 January.
- S K Dutta, K Majumdar, T Satyanarayana and A K Singh. 2015. 4R Nutrient Stewardship – A way forward towards sustainable agriculture. SATSA Mukhapatra-Annual Technical Issue, 19, pp: 19-35.
- S K Mondal, A K Singh, K S Das, F H Rahman, S K Roy, P P Pal and H K De. 2015. More profitable piggery enterprise through various managemental interventions - case of a tribal district of Jharkhand, India. In: Abstracts of ISAPM National Seminar on "Livestock Production Practices for Small Farms of Marginalized Groups and Communities in India" held at Aizawl, Mizoram, 28-30 January, pp- 255.
- S K Mondal, F H Rahman, S K Roy, PP Pal and AK Singh. 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, 6-7 March, pp: 162.
- S K Mondal, K S Das and H K De. 2015. Role of livestock in establishing gender equality in rural India. In: Abstracts of National Seminar on "Gender equity, sensitization and women empowerment" to be held at SVPUAT, Meerut, 11-12 March, pp: 107-108.



- S K Mondal, K S Das, F H Rahman, H K De, S K Roy, P P Pal and A K Singh. 2015. Livelihood security for small holder farmers through livestock production. In: Abstracts of XII Agricultural Science Congress held at National Dairy Research Institute, Karnal, 3-6 February, pp: 273.
- S K Roy, A K Singh, P P Pal, H K De, F H Rahman, S K Mondal and K S Das. 2015. Skill and human resource development for diversification of employment and income opportunity. In: Abstracts of XII Agricultural Science Congress held at National Dairy Research Institute, Karnal, 3-6 February, pp: 273.
- S K Singh, B Kumar and F H Rahman. 2015. Effect of bio-fertilizer on growth and yield of wheat in major nutrient deficient soils of Jamui. Souvenir and Book abstracts: National Conference on Indigenous Innovation and foreign technology transfer in fertilizer industry: needs, constraints and desired simplification. ICAR-CRIJAF, Barrackpore, 17 January.
- S K Singh, B Kumar, P K Singh, C Singh, F H Rahman and A K Singh. 2014. Assessment of different levels of potassium on growth and yield attributes of rice in South Bihar. Compendium: Seventh National Extension Education Congress on Translational Research -Extension for Sustainable Small Farm Development held at ICAR Research Complex for NEH Region, Umiam, Meghalaya, 8-10 November.
- S K Singh, P K Singh, C Singh and F H Rahman. 2015. Response of wheat under different tillage and nitrogen levels in South Eastern Bihar. Souvenir and Book abstracts: National Conference on Indigenous Innovation and foreign technology transfer in

fertilizer industry: needs, constraints and desired simplification. ICAR-CRIJAF, Barrackpore, 17 January.

- S Kaswan, B H M Patel, S K Mondal, D Upadhyay and S Sahu. 2015. Estimation of optimal minimum space for crossbred pigs (Landrace x Desi) using K value in Indian conditions. In: *Abstracts* of XII Agricultural Science Congress held at National Dairy Research Institute, Karnal, 3-6 February, pp: 147.
- S Kumar and F H Rahman. 2015. Green Technology for Sustainable Agriculture. Souvenir and Book abstracts: National Conference on Indigenous Innovation and foreign technology transfer in fertilizer industry: needs, constraints and desired simplification. ICAR-CRIJAF, Barrackpore, 17 January.
- T Chandrasekhar, K S Das, J K Singh, G K Gaur and Bharat Bhushan. 2015. Prepartum udder and teat measurements and its relationship with subsequent milk production performance in promiparousNili-Ravi buffaloes. In: Abstracts of ISAPM National Seminar on "Livestock Production Practices for Small Farms of Marginalized Groups and Communities in India" held at Aizawl, Mizoram, 28-30 January, pp: 104-105.
- T Chandrasekhar, K S Das, J K Singh, G K Gaur, Bharat Bhushan and S A. 2015. Prediction of 60 days milk production based on body, udder, and teat measurements in primiparousNili-Ravi buffaloes. In: Abstracts of XII Agricultural Science Congress held at National Dairy Research Institute, Karnal during 3-6 February, pp: 129.



22. DISTINGUISHED VISITORS -

WEST BENGAL

Name of KVK	Date	Name of the person	Purpose of visit
BANKURA	09.02.2015	Sri Paritosh Roy, Director WB	To visit KVK activities
BIRBHUM	12.04.2014	Prof. Y. Kasturirangan, Hon'ble Member of Planning Commission and Hon'ble Member of the Rajyasabha	To visit different aspects of Work undertaken by KVK and functioning of different Farm Science Centres.
	29.05.2014	Prof. O. I. Joarder, Vice-Chancellor, First Capital University of Bangladesh	To visit different aspects of Work undertaken by KVK
	22.01.2015	Prof. Sushanta Dattagupta, Vice-Chancellor, Visva-Bharat	To inaugurate the Training Programme on Protection of Plant Varieties and Farmers' Rights Act
	09.01.2015	Prof. Ray Bromley, Vice Provost for International Education of the State University of New York, USA	To visit different aspects of Work undertaken by KVK
	31.03.2015	Sri Bikash Roy Chowdhury, Sabhadhipati, Birbhum Zillah Parishad, Suri, Birbhum	KisanMela – 2015
BURDWAN	11.11.14	Prof. Purnendu Biswas, Vice Chancellor	To inaugurate Kisan Mela cum technology demonstration
	28.01.15	Mr. Purnendu Bose, Minster In-Charge, Agril., Govt. of West Bengal	To visit KVK stall at Mati Utsab
	28.01.15	Mr. Subhasish Batabial, Parliamentary Secretary	To visit KVK stall at Mati Utsab
	28.01.15	Mr. Becharam Manna, Minister of State, Agriculture, Govt of West Bengal	To visit KVK stall at Mati Utsab
	09.02.15	Dr. Kevin Gallagher, FAO Representative	To visit KVK stall at Mati Tirtha Krishi Kotha
	09.02.15	Mr. Gaur Ch. Mandol, MLA	To visit KVK stall at Mati Tirtha Krishi Kotha
COOCHBEHAR	27.02.2015	Prof. B. Bandopadhyay, Vice-Chancellor, UBKV	KVK performance
	30.03.2015	Mrs. Puspita Dakua, Sabhadhipati, Cooch Behar Zilla Parishad	Kisan Mela
	30.03.2015	Mr. Sunil Mandi, Head, CTRI, Dinhata	Kisan Mela
DAKHIN DINAJPUR	27.05.2014	Dr. Aninda Sundar Ghosh, Dy. Director of Fisheries, Central & Gour Banga Zone	To visit the KVK and its activities
	18.07.2014	Sri. A Lepcha, Additional District Magistrate, Dakshin Dinajpur	To visit the KVK
	18.07.2014	Sri. Dilip Paul, Special Secretary, PRD Department, Govt. of W.B.	To visit the KVK
	18.07.2014	Sri. Indranil Mukhopadhyay, Dy. Secretary, P & RD Department	To visit the KVK
	18.07.2014	Smt. Piyali Roy, STARPARD, P & RD	To visit the KVK
	18.07.2014	Smt. Madhumita Chakrabnorty, STARPARD, P & RD	To visit the KVK
	02.02.2015	Sri. M. Nageswar Rao, CGM, NABARD, Kolkata	To attend the Technology Week and Krishi Mela - 2015
	03.02.2015	Dr. AnupRaha, Director IMD, Gangtok	To attend the Technology Week and Krishi Mela – 2015
	31.03.2015	Sri. Tapsh Choudhury, District Magistrate, DakshinDinajpur	To attend the Kisan Mela – 2015



Name of KVK	Date	Name of the person	Purpose of visit	
	31.03.2015	Sri. Abir Chatterjee, Secretary District legal service, Balurghat, DakshinDinajpur	To attend the Kisan Mela – 2015	
DARJEELING	09.09.2014	Tapas Kr. Majhi, Co-ordinator, Kamalakantapur bio village, Birbhum		
	09.09.2014	Dr. S. N Das, SAMETI, Kolkata		
HOOGHLY	11.03.2015	Shri PurnenduBasu, Minister-in-charge Agriculture, Govt. of WB	KVK Visit	
	11.03.2015	Shri Becharam Manna, Minister of State Agriculture, Govt. of WB	KVK Visit	
	11.03.2015	Shri PradipMajumder, Agriculture Advisor to CM, Govt. of WB	KVK Visit	
	11.03.2015	AlhajMehbub Rahman, ZillaSabhadhipati, Hooghly	KVK Visit	
HOWRAH	20.04.14	District Horticulture Officer	Training	
	28.08.14	Mr. M.S. Basu, Ex-Director, VRCG (ICAR) & QRT member	Review KVK's work	
MURSHIDABAD	10.08.14	Colonel Anil Pandit, Director, Army Recruiment Officer, Msd	For KVK visit	
	18.08.14	Khokan Devnath, Deputy Director, CDB	For Coconut Trg.	
	30.03.15	Md. Badaruddoza Khan, MP, Msd	For KishanMela	
NORTH 24-PGS	09.09.14	Mr. C. Sarkar, Director, Dept. of Finance (Expenditure), Govt. of India, New Delhi	Monitoring the KVK activity and development	
	17. 12.14	Mr. Dipak Sarangi, DHO, Barasat	FoCT training programme	
		Mr. Debabrata Pal, ADA, Barasat	FoCT training programme	
PURULIA	19.03.2015	Smt. Srabani Guha, Secretary (Agriculture), Govt. of WB	Technology Week, 2014-15	
	05.01.2015	Sri. Sristi Dhar Mahato, Sabhadhipati, Purulia Zila Parisad	To monitor the activities of KVK	
SOUTH 24-PARGANAS -	16.04.2014	Dr. Gitanjali Chaturvedi, The World Bank, New Delhi	NAIP project documentation	
Nimpith		Ranjan Samanta Ray, The World Bank, New Delhi		
	05.07.2014	Pratima Mondal, Member of Parliament (MP), Joynagar Constituency	Interaction with KVK scientists	
SOUTH 24-PGS	03.12.2014	Dr. S. Ayyappan, DG, ICAR	Visit to the KVK	
-NARENDRAPUR	11.03.2014	Dr. Samarendra Nath Khanra, Dy. Director, Dept. of FPI & Horticulture	PPV&FR Programme	
	11.03.2014	Dr. Subhas Sinha, Joint Secretary, Govt. of WB, Dept. Of Ag	Workshop	
	10.04.2015	Dr. Soumen Mahapatra, MIC, Dept. of Water Resources Dev, GoWB	Technology Week	
UTTAR DINAJPUR	26.05.2014	Smt. T.S. Raji Gain , GM, NABARD, Kolkata	KVK visit	
	26.05.2014	Mr. M. Nageswara Rao, DGM, NABARD, Kolkata	KVK visit	
	24.02.2015	Smt. Smita Pandey, IAS, DM, Uttar Dinajpur	Technology week	
WEST MIDNAPUR	30.03.2015	Dr. Uma Soren, M.P., Jhargram Constituency	Kishan Mela cum Exhibition & Farm Visit	

BIHAR



Name of KVK	Date	Name of the person	Purpose of visit
Aurangabad	18.06.2014	Kurt Tsoo (BMGF USA)	IRRAS Field visit
		Adarsh Anand	
	28.08.2014	Mr. Susil Kumar Singh (MP Aurangabad)	Farm visit
	11.09.2014	Dr. R. K. Sohane (DEE)	Participant in SAC meeting and field visit
	11.09.2014	Dr. A. K. Singh (ZPD)	NICRA monitoring committee
	15.10.2014	Richel Anuska	CRS, Patna
Banka	02.05.2014	Dr. M.L. Choudhary, Hon'ble V.C, BAU, Sabour	ZREAC Meeting
	21.05.2014	Dr. K.D. Kokate, Ex DDG Extn.	Visit KVK Farm and running units
	21.7.2014	Dr. S.P. Singh, Consultant, IRRI	Visit KVK Farm and running units
	14.08.2014	Dr. Panduranj. D, Wathankar, Ex- Director of Agri	KVK Visit
	03.09.2014	Sri Ramrup Harijan, Ex MLA, Dhoraiya, Banka	KVK Visit
	07.11.2014	Sri Gaji Islam, DGM, IDBI, Bihar	KVK Visit
	29.12.2014	Smt. SwetaKumari, Hon'ble chairman, ZilaParisad Banka	KVK Visit
	13.01.2015	Dr. Basant Ram, Ex-Vice Chancellor, RAU, Pusa	KVK Visit
	26.03.2015	Sri Saket Kumar, IAS,District Magistrate, Banka	Technology Week
Bhojpur	29.04.2014	Sri PremchandMunshi ,Director, IFFCO	Cooperative Training
	30.01.2015	DrBoresh, IRRI, Philippines	ZT Drill &RCT Field visit
Buxar	13.05.2014	Sh. SriniwasSahay, Programme Executive, All India Radio, Patna	Insure participation of KVK personnel in Radio talk at AIR, Patna
	15.11.2014	Dr. Rasheed Sulaiman, Director, Centre for Research on Innovation and Science Policy (CRISP), Hyderbad	Participation in promotion of Zero tillage in Buxar district.
	15.11.2014	Dr. Sylvie Bronder, Professor, Dept. of Agronomy, DURDBE University, USA	Participation in promotion of Zero tillage in Buxar district.
	11.12.2014	Amy Pope, Programme Coordinator, BMGF, USA	Monitoring of IRRAS project and review the work done under IRRAS, Project.
	11.12.2014	Jacob Hersaman, CRS, USA	Monitoring of IRRAS project and review the work done under IRRAS, Project.
	11.12.2014	VaseyMwaja, BMGF, USA	Monitoring of IRRAS project and review the work done under IRRAS, Project.
	11.12.2014	Sudhanshu Singh, IRRI, Philippines	Monitoring of IRRAS project and review the work done under IRRAS, Project.
	11.12.2014	Tony Castlemen, CRS, India	Monitoring of IRRAS project and review the work done under IRRAS, Project.
	11.12.2014	Rachel Onuska, CRS, India	Monitoring of IRRAS project and review the work done under IRRAS, Project.
Darbhanga		District coordinator of Nehru Yuva Kendra	Training Purpose
E & OE. Champaran	01.08.2014	Dr. R. K. Mittal, Vice Chancellor, RAU, Pusa	Interaction with KVK, Scientist and farmers and visited farmers field at Belwatiya

851-119	
X	
3	
100.00	
ICAR	

Name of KVK	Date	Name of the person	Purpose of visit
Gaya	14.09.2015	Dr. S. Ayyappan, DG, ICAR, New Delhi	KVK Visit
		Dr. M. L. Choudhary, VC, BAU, Sabour	KVK Visit
Gopalganj	28.02.2015	Dr. R.K. Mittal, Vice-chancellor, RAU, Pusa	Inauguration of Administrative Building of KVK
Jamui	23.12.2014	Mr. Shashikant Tiwari, DM, Jamui	KVK Visit
	23.12.2014	Mr. Ramendra Kumar, SDM, Jamui	Chief Guest- KISAN DIWAS
	26.2.2015	Director CRIDA, ICAR	Discussion on AICRP on Dryland.
Kaimur	10.11.2014	Sri C. P. Sinha, Chairman (Minister level), RajyaKisanAyog, Bihar	To visit KVK
Kisanganj	18.05.2014	Dr. K. D. Kokate, DEE, MPKV, Rahuri	KVK, Visit
	24.02.2015	Dr. Jawed Bharti, MLA, Kishanganj	Attend training programme
Madhubani	21.09.2014	Sri Ashok Chaudhary (M.L.C)	Kisan Gosthi
	21.09.2014	Dr. Madan Mohan Jha (M.L.C)	-do-
	28.03.2015	Sri Rajesh Meena I.A.S (S.D.O. Benipatti)	Chief Guest Kisan awareness and Kisan Mela Programme
Munger	09.12.2014	DFO, Munger & Sub inspector, Munger	Auction of Orchard
Muzaffarpur	09.08.2014	Dr. R. K. Mittal, VC, RAU, Pusa	Field and KVK visit.
Nalanda	28.08.14	Hira Bind, MLC Bihar	To see the activity of KVK
	28.08.14	Sri Shrawan Kumar, Rural development in parliamentary affairs, Bihar	To see the activity of KVK
	17.03.15	Sri C.P.Sinha., Charman, RajyaKisanayog	To see the activity of KVK
Nawadah	16.07.14	Sri Rameshwar Singh , D.D.C Nawada	To see the activities of KVK
	28.03.15	CJM, Nawada	To see the activities of KVK
Purnea	30.05.2014	V. Balasubramanian, Coimbatore (T. N.)	To visit monitoring of ground nut project at RRSS JalalgarhPurnea sponsored by ICRISAT Hyderabad
	12.09.2014	Alison Laning (Australia)	Survey of KVK activities in Purnea
	12.09.2014	Donald Gaydon, CSIRO, Australia	To visit KVK activities
	12.09.2014	Perry Pooltan, CSIRO, Australia	To visit KVK activities
	12.09.2014	Patric Wail, CIMMYT, Mexico	To visit KVK activities
	12.09.2014	Mahesh Kumar Gathela, CIMMYT, Bangladesh	To visit KVK activities
	06.02.2015	Dr. P. N. Jha (Excutive Director), All India Radio, Purnea	To organize Radio Kisan Day on 15 th Feb 2015
Samastipur	04.06.2015	Sri Durga Prasad Singh, CINET Member, RAU, Pusa	To visit the enterprises of KVK, Birauli.
Saran	29.08.2014	Shri Raman Jha, Chief Manager, SBI Chapra	Visit of the KVK
		District Forest Officer, Chapra	Visit of the KVK
	19.11.2014	Dr. R. K. Mital, Vice Chancellor, RAU, Pusa	Visit of the KVK
	27.03.2015	Mr. Rabi Bhushansinha, G. M. D. I.C., Saran	Visit of the KVK
Sheo har	24.06.2014	Sri Binod Narayan Singh, D.M., Sheohar	Inauguration of sponsored programme
	12.09.2014	Sri S. K. Sinha, Bank of Baroda, Sheohar	SAC Meeting
Siwan	10.03.15	Shree Sanjay Kumar Singh, DM, Siwan	To supervise KVK, activities
Vaishali	16.09.14	Dr. Edward Breshyin, World Bank/Washing DC	Visit for interaction with KVK, ATMA & farm/farm women.
	16.09.14	Helen Leitch, New Delhi	Visit for interaction with KVK, ATMA & farm/farm women.



Name of KVK	K Date		Ν	ame of the person	Purpose of visit
West Champaran		01.08.2014	D	r. R. K. Mittal, VC, RAU, Pusa	To review on-going activities of KVK
JHARKHAND					
Name of KVK		Date		Name of the person	Purpose of visit
Bokaro		19.08.2014		Sri, ChatruramMahto, Ex MLA	KVK, Visit
Chatra		26.06.2014			
Deoghar		4.3.2015		Sri Ameet Kumar, DC, Deoghar	SAC, Meeting
		4.3.2015			
		4.3.2015		District Dairy Officer, Deoghar	SAC, Meeting
		4.3.2015		G.M., D.I.C.,Deoghar	SAC, Meeting
		15.3.2015		Sri Randhir Singh, Ag. Minister, Jharkhand	Stall Visit of KisanMela
		15.3.2015		Sri BadalPatralekh, MLA, Jarmundi	Stall Visit of KisanMela
		21.3.2015		Sri Randhir Singh, Ag. Minister, Jharkhand	Stall Visit of KisanMela
		21.3.2015		Sri Raj Paliwal, Labour Minister, Jharkhand	Stall Visit of KisanMela
		21.3.2015		Sri NishikantDubey, MP, Godda	Stall Visit of KisanMela
		21.3.2015		Sri Ameet Kumar, DC, Deoghar	Stall visit of KisanMela
E. Singhbhum		22.01.2014		Dr. Varun Kumar, CR Department, TATA power	Interacting with Scientist
		08.02.2014		Sri Ramdas Soren, MLA, Ghatsila	To inspire participants of self help group who were attending training programme on Lac products.
		01.12.2014		Dr. Virendra Singh, Addl. Commissioner, New Delhi	For seeing KVK activities and its collaboration with ATMA.
Garhwa				DC, Garhwa	Inauguration of Training
Godda		05.01.2015		Sri R. S. Sharma, IT Secretary, GoI	To visit and monitor the work of GVT
					KVK, Godda in Pipra, Chilra and Sunderpahari villages
		06.09.2014		Sri Rajesh Kumar Sharma, DC, Godda	To visit and monitor the work of GVT
					KVK, Godda in Pipra and Chilra villages.
		29.09.2014		Sri Rajesh Kumar Sharma, DC, Godda	District level workshop
		20.11.2014		Sri K. C. Panda, CGM, NABARD, Jharkhand	To monitor the progress of the project funded by NABARD
		11.03.2015		Sri Prashant Kumar, Ex. M. L. A., Pauriahaat, Godda	Enquiry about the activities of KVK
		19.03.2015		Dr. H. C. Gupta, Director, JTDS	Official
Gumla		10.05.2014		Shri BhimSenTooti, SP Gumla	Visit to KVK activities
		22.06.2014		Prof. ORS Roa Vice Chancellor, ICFAI university, Jharkhand, Ranchi	Visit to KVK activities
		21.08.2014		Shri Thawar Chandra Gahlot, Union Minister of Social justice and empowerment, Govt. of India	Visit to KVK activities
		16.09.2014		Justice P. P. Bhatt, Jharkhand High Court	Visit to KVK activities
		17.09.2014		Shri BhupendraYadav, Rajyasabha MP	Visit to KVK activities
		11.10.2014		Dr. Ranbir Singh Rathi, Director, NBPGR, Ranchi	NBPGR Training
		13.01.2015		Vishnu Dayal Ram, Member of Parliament	Visit to KVK activities



Name of KVK	Date	Name of the person	Purpose of visit
	14.01.2015	Sudarshan Bhagat, Minister of State for Ministry of State for Rural Development	Kisanmela at Sato
	23.02.2015	Shri Shivshankar Oraon, MLA, Gumla	Technology week inauguration
	18.03.2015	Shri Gaurishankar Minj, Deputy Commissioner Gumla	Visit
Hazaribag	7.4.2014	Dr. Manzoor Hussain, IRRI-India	Field visit under IRRI programme
	9.4.2014	Alasn de Tanvary, University of California	Friendly visit to KVK
	26.8.2014	Dr. S. Ayyappan, DG, ICAR, New Delhi	Official visit of KVK
Pakur	12.7.2014	Sri Mistry Soren, Ex-MLA, Maheshpur	Normal visit
	2.10.2014	Sri Phidelish Toppo, Ex-DC, Pakur	Participation in swachhatAbhiyan
	20.1.2015	Sri Stephan Marandi, MLA, Maheshpur	Normal visit
	25.2.2015	Sri SuphalMarandi, Ex-MLA,Maheshpur	Normal visit
Palamu	07.03.2014	Dr. C.H. Rao, Coordinator, CRIDA & Co-PI, NICRA	Visited NICRA villages
	15.01.2015	Dr. George John, V.C., BAU, Ranchi	To visit the KVK Farm and to meet the 40 TSP farmers at KVK training hall.
Saraikela	30.03.2015	Sri Devendra Nath Champia, Ex. MLA and Bihar Bidhan Sabha Upadhyakahya,	For technical guidance

23. AWARDS

A number of awaeds has been receieved by the KVKs and famers during the year which are indicated in below table

Name of KVK	Award(s) received	Conferring agency	Year	Details of award(s): Cash prize/Citation/ both
Port Blair	Best District Level farmers (Shri Maindra Dhali)	Andaman and Nicobar Administration	2014	Rs 10,000.00 Land Based IFS
	Best Kisan Award.Smt. Shyama Halder	CIARI	2015	Rs.3,000.00 For her meritorious contribution for feed formulation with locally available materials
Car Nicober	Farmer Innovation Awards (Mr. A Nazir Hussain, Car Nicobar)	Tamil Nadu Fisheries University, Nagapattinam	2014	Rs.3,000.00 For his innovation in fabrication of fishing gear by locally available material
	2 nd Prize for Best Stall in Carnic / Tribal Festival	Nicobar Administration	2015	Certificate.For Displaying IFS and Agricultural technologies relevant for Nicobar district.
N & M Andamans	Best Horticultural produce Sh.Shyampada Roy	CIARI	2015	Rs.2,500.00 For displaying best horticulture produce during Kisan Mela 2015 at CIARI
Aurangabad	Best stall award	BAU Sabour Bhagalpur	2014-15	Citation
Jehanabad	 (i) 1st prize for KVK stall (exhibit)during Farmers fair (1st-3rd March 2015), BAU,Sabour (ii) 2nd prize for sending weekly news for weekly e-news letter for BAU, Sabour, 	(i) BAU, Sabour(Bhagalpur)(ii) BAU, Sabour(Bhagalpur)	(i) 2014-15 (ii) 2014-15	(i) Certificate (ii) Certificate



Name of KVK	Award(s) received	Conferring agency	Year	Details of award(s): Cash prize/Citation/ both
Khagaria	 Sending maximum no of Text Message to the farmers through SMS portal Publishing maximum no of Weekly e-news for e-news letter Stall exhibition in Kisan Mela at BAU, Sabour 	BAU, Sabour, Bhagalpur	2014-15	 20-05-14 - Second position for sending maximum no of text messages among KVKs of BAU, Sabour 18-10-14 - Second position for sending maximum no of text messages among KVKs of BAU, Sabour 18-10-14 - First position for publishing maximum number of weekly event news for e-newsletter among KVKs of BAU, Sabour 02-03-15 - Third position in stall exhibition among KVKs of BAU, Sabour in Kisan Mela 08-05-15 - Third position for publishing maximum number of weekly event news for e-newsletter among KVKs of BAU, Sabour in Kisan Mela
Kishanganj	Md Hasmat Rehan	BAU, Sabour	2015	Both
	Md. Rafique	BAU, Sabour	2014	Both
	Nazra Mandal	BAU, Sabour	2014	Both
Lakhisarai	Kisan Mela	BAU, Sabour, Bhaglpur	2015	Certificate of best Stall
Patna	Best KVK Scientist Award	ISEE	2015	Citation
Rohtas	 a) Best Innovative farmer Award b) Innovative farmer Award c) Innovative farmer Award d) Innovative farmer Award e) Innovative farmer Award f) Innovative farmer Award 	a) ICAR-CPRI, Shimla & IPA, Shimla b) PD, ATMA c) BAU, Sabour, Bhagalpur d) ICAR-CPRI, Shimla & IPA, Shimla e) BAU, Kisan Mela-2015, Sabour, Bhagalpur f) DAO, Rohtas	a) 2015 b) 2015 c) 2014 d) 2015 e) 2015 f) 2015	Citation
Gumla	Best NICRA KVK of Zone- II	ICAR	2011-2014	Cash (1 lakh) & Citation
Pakur	Best stall award	CPRI,Patna, BAU, Ranchi	2014-15	Citation
Ranchi	Best women farmers	BAU,Ranchi	2014-15	Prize and citation
	Best lac producer in Jharkhand	BAU,Ranchi	2014-15	Prize and citation
	Best progressive farmers	BAU,Ranchi	2014-15	Prize and citation
	National Award for vegatable farming	ICAR	2014-15	Prize and citation
Saraikela	Excellent Lac Promotion Executive Award	IINRG, Namkum	2014	Citation
Burdwan	2nd prize in poster presentation in National Conference on Indigenous Innovation and Foreign Technology Transfer in Fertilizer Industry: Needs, Constraints and Desired Simplification	Society of Fertilizer and Environment & CRIJAF(ICAR) Barrackpore	2015	Cash Prize of Rs. 3000/- and a certificate



Name of KVK	Award(s) received	Conferring agency	Year	Details of award(s): Cash prize/Citation/ both
Coochbehar	Farmers award received by Morjina Bibi and Biren Das at Krishi Mela-2015 org. by UBKV	UBKV	2015	Both
Dakshin Dinajpur	Innovator farmers award (01), Progressive farmers award (03)	22nd RCM Meeting of ICAR,CIFRI, BKP, Kol.,UBKV Krishi Mela-2014-15	2014-15	Certificate of recognition for Innovative activity(01) & adoption of advanced agril practices(03) as progressive activity.
Darjeeling	Agrani Krishak Sanman	UBKV	2014-15	Citation
Howrah	Best Extension Professional	Society of Extension Education, Agra	2014	Memento and certificate
Uttar Dinajpur	Best exhibition Stall in the Central Krishi Mela, 2014- 15 of UBKV	UBKV	2014-15	Citation and memento