वार्षिक प्रतिवेदन

ANNUAL REPORT
2013–14

क्षेत्रीय परियोजना निदेशालय - क्षेत्र ८
भारतीय कृषि अनुसंधान परिषद
बैंगलूर - 560 024

Zonal Project Directorate - Zone VIII
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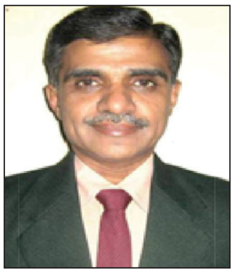

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क्षेत्रीय परियोजना निर्देशक

Dr. Sreenath Dixit
Zonal Project Director

क्षेत्रीय परियोजना निदेशालय - क्षेत्र ८
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Preface

Krishi Vigyan Kendra (KVK) is an important institution in the National Agricultural Research System vested with the responsibility of frontline extension in agriculture and allied sectors. This Directorate under the Agricultural Extension Division of ICAR is responsible facilitating implementation of mandated activities of KVKs located in the States of Karnataka, Kerala, Tamil Nadu, Goa and the Union Territories of Puducherry and Lakshadweep. There are 81 KVKs located across these States and Union Territories that are providing frontline extension service. These KVKs have evolved over time and are responding to the needs of the farmers and the problems they are faced with. Thus, KVKs have attained an important position at the district level in terms of their contribution to overall development of the district serving as knowledge and resource centre.

During the year under report, although the rainfall situation was much better compared to that of previous year, there were areas that did not receive adequate rainfall. Despite this, the KVKs could demonstrate the technologies that could help farmers cope with adverse situations. The contribution of nine NICRA KVKs of this zone is particularly noteworthy, as they are working in a project mode to address issues related to climate variability.

The Directorate is constantly engaged with the host organizations of KVKs, Programme Coordinators, Directors of Extension of State AgriculturalUniversities and the farmers at large. The main objective of the engagement is to bring about improvement in technology related aspects as well as innovative institutional mechanisms for technology driven development. In this endeavour, many KVKs of the Zone have been contributing immensely. In order to recognize such efforts, the ICAR has instituted awards at Zonal and National level to recognize and reward excellence. KVK Bangalore Rural was adjudged as the Best KVK at the Zonal Level by recognizing its leadership in agricultural development in the district. I congratulate the staff and farmers who have contributed to help the KVK attain this distinction.

National KVK Conference held at Bengaluru was an important milestone in the Directorate's endeavour to provide a platform for cross learning and sharing of experiences by a large number of stakeholders of the KVK system. The event was recognized as one of the best conducted so far and it is a matter of pride for all those who were associated with the organizing of this mega event of national significance. I congratulate all the institutes and individuals who made the 8th National KVK Conference a grand success.

This report summarizes the activities and outcomes of the programme implemented by the KVKs of this Zone during the year 2013 -14. It will also serve as a reference material for data and information on different frontline extension activities of the KVKs. I hope this information will be of interest and use to different stakeholders of NARS.

Place : Bangalore
Date : July 24, 2014

(Sreenath Dixit)

CONTENTS

कार्यकारी सारांश

भारतीय कृषि अनुसंधान परिषद (आईसीएआर) ने जिला स्तर पर आईसीएआर संस्थान, राज्य कृषि विश्वविद्यालय (एसएयु), गैर-सरकारी संगठन (एनजीओ), स्वशासी विश्वविद्यालय (डीयु) एवं राज्य कृषि विभाग (एसडीए) जैसे विभिन्न मेज़बान संगठनों के अधीन कृषि विज्ञान केन्द्रों (केवीके) का नेटवर्क स्थापित किया है। 31 मार्च, 2014 तक 638 कृषि विज्ञान केन्द्रों की स्थापना की गई, जिनमें से 81 कृषि विज्ञान केन्द्र मण्डल **VIII** में हैं। मण्डल परियोजना निदेशालय- मण्डल **VIII** कर्नाटक (31), तमिल नाडु (30), केरल (14), पुदुच्चेरि (3), गोवा (2) और लक्षद्वीप (1) के 81 कृषि विज्ञान केन्द्रों के प्रौद्योगिकीय मध्यवर्तन एवं अग्रक्षेत्र विस्तरण कार्यक्रमों का समन्वयन, योजना तैयारी, निगरानी तथा मूल्यांकन करता है।

कृषि विज्ञान केन्द्र राज्य कृषि विश्वविद्यालयों और भारतीय कृषि अनुसंधान परिषद संस्थानों की प्रौद्योगिकियों का सहारा लेकर तथा किसानों एवं अन्य साझेदारों को सहभागी बनाकर प्रौद्योगिकियों का मूल्यांकन, परिष्करण एवं प्रदर्शन का कार्य करते हैं। कृषि विज्ञान केन्द्र अपने साझेदारों के लिए आवश्यकता-आधारित क्षमता विकास कार्यक्रमों का आयोजन करते हैं तथा समुचित अग्रक्षेत्र विस्तरण कार्यक्रमों के द्वारा उन्नत कृषि प्रौद्योगिकियों के बारे में अभिज्ञान पैदा करते हैं। प्रौद्योगिकियों के बारे में प्रारंभिक समझ के लिए गुणवत्तायुक्त बीजों, रोपण सामग्रियों, पशु-धन नस्लों, पशु उत्पादों एवं जैविक-उत्पादों के उत्पादन और वितरण कार्य भी करते हैं। कृषि विज्ञान केन्द्र जिले की कृषि अर्थव्यवस्था को सुधारने के लिए सरकारी, निजी एवं स्वैच्छिक क्षेत्रों द्वारा ली जा रही पहल को समर्थन देने के लिए कृषि प्रौद्योगिकी के ज्ञान एवं संसाधन केंद्रों के तौर पर कार्य कर रहे हैं। वर्ष (2013-14) के दौरान प्राप्त की गई महत्वपूर्ण उपलब्धियों का सारांश निम्नानुसार है:

1. प्रौद्योगिकी मूल्यांकन तथा परिष्करण

* कृषि विज्ञान केन्द्रों द्वारा 361 स्थानों पर 1973 ओएफटी के माध्यम से कुल 301 प्रौद्योगिकियों का मूल्यांकन किया गया तथा 10 प्रौद्योगिकियों का परिष्करण किया गया। इनमें से प्रौद्योगिकियों का 88% धानों के अंतर्गत था तथा 11% पशुधन, कुक्कुट पालन एवं मत्स्य पालन क्षेत्रों के अंतर्गत था।
* धानों के अंतर्गत, कुल 264 प्रौद्योगिकियों का मूल्यांकन किया गया, जिनमें से बहुविध मूल्यांकन के लिए बहु संख्यक प्रौद्योगिकियों का मूल्यांकन किया गया (75), तत्पश्चात् एकीकृत रोग प्रबंधन (39), एकीकृत पोषण प्रबंधन (33), एकीकृत धान प्रबंधन (26), फसल पद्धति (25), एकीकृत कीट प्रबंधन (23), संसाधन संरक्षण प्रौद्योगिकियॉं (17), एकीकृत कीट तथा रोग प्रबंधन (12), कृषि मशीनरी (04), प्रक्रमण तथा मूल्यवर्धन (03), नीरस काम में कटौति (02), बीज/रोपण सामग्री उत्पादन (02), अपतृण प्रबंधन(02), एवं भण्डारण तकनीक (01) और धानों के अंतर्गत 09 प्रौद्योगिकियॉं विभिन्न विषयक क्षेत्रों में परिष्कृत जैसे फसल पद्धति (01), कृषि मशीनरी (03), संसाधन संरक्षण प्रौद्योगिकियॉं (02) और बीज/रोपण सामग्री उत्पादन (02), नीरस काम में कटौति (01)।
* पशु पालन के अंतर्गत, कुल 33 प्रौद्योगिकियों का मूल्यांकन किया गया, जिनमें से 13 प्रौद्योगिकियॉं उत्पादन एवं प्रबंधन में थीं, तत्पश्चात् रोग प्रबंधन (10), और पोषण प्रबंधन (10)।
* काबुली चना सीवी-जेजी-14 की उच्च पैदावार किस्मों ने यथा बेलगाम I, बेल्लारी एवं बीदर में क्रमश: 8.78 क्विं/हेक्ट, 15.50 क्विं/हेक्ट और 15.00 क्विं/हेक्ट के साथ उत्तर कर्नाटक के सभी तीन जिलों में बेहतर पैदावार दिया और क्रमश: बीसीआर 4.28, 2.61 एवं 2.34 के साथ रु.18830, रु.26800 और रु.25750 का निवल लाभ दिया।
* हावेरी और गदग जिलों में मूँगफली सीवी. कदिरि 6 की क्रमश: 17.00 क्विं/हेक्ट और 16.67 क्विं/हेक्ट की बेहतर फसल पाई गई, और क्रमश: बीसीआर 1.45 एवं 1.68 के साथ रु.16780 और रु.23480 का निवल लाभ प्राप्त हुआ।

* प्याज़ की भीम सुपर किस्म ने कोप्पल (320 क्विं/हेक्ट) और धारवाड़ (३८० क्विं/हेक्ट) में बेहतर फसल दी, जबकि अर्का कल्याण ने बेल्लारी (320 क्विं/हेक्ट) और हावेरी (३८० क्विं/हेक्ट) में बेहतर फसल दी। निवल लाभ रु.1.20 लाख/हेक्ट से रु.1.80 लाख/हेक्ट के बीच था और कोप्पल में बीसीआर ४.५७ था, धारवाड़ में 9.50 एवं हावेरी में 8.40 था।
* कोज़िकोड जिले में राजमा सीवी.भाग्यलक्ष्मी ने सीवी.काशि कंचन (98.90 क्विं/हेक्ट) की अपेक्षा बेहतर पैदावार दिखाया और 2.62 बीसीआर के साथ रु.61850/हेक्ट का निवल लाभ दिया। तथापि, बेहतर बाजार कीमत के कारण सीवी.काशि कंचन ने रु.75340/हेक्ट का उच्चतर निवल लाभ दिखाया। त्रिशूर जिले में सीवी.लोला ने 1.82 बीसीआर के साथ और रु.270000/हेक्ट के निवल लाभ के साथ 150 क्विं/हेक्ट की उच्चतर पैदावार दी जिसके बाद सीवी.एनएस 621 (148 क्विं/हेक्ट; रु.262600/हेक्ट निवल लाभ एवं 1.79 बीसीआर)।
* दोनों कोप्पल तथा कोडगु जिलों में 1.2मी x 1.2 मी X 2 मी के अंतराल में रोपित युग्मित पंक्ति ने बेहतर निष्पादन दिखाया तथा कोप्पल में 8.22 बीसीआर युक्त 135 ट/हेक्ट की पैदावार के द्वारा रु.1029000/हेक्ट का उच्चतर निवल लाभ दिया और कोडगु में 3.७५ बीसीआर युक्त 50 ट/हेक्ट के द्वारा रु.308000/हेक्ट का निवल लाभ दिया। परिणामों ने पुष्ट किया कि दोनों जिलों में केले की युग्मित पंक्ति की रोपण व्यवस्था अत्यधिक लाभप्रद रहा।
* उडद में मीथाईलो बैक्टीरियम के अनुप्रयोग ने थेणि में अधिक उपज (7.8 क्विं/हेक्ट) दी जिसके बाद टुटिकोरिन में 7.2 क्विं/हेक्ट की पैदावार पाई गई। तथापि, खेती की निम्नतर लागत के कारण थेणि में 1.66 बीसीआर एवं रु.17000/हेक्ट के निवल लाभ की अपेक्षा टुटिकोरिन में निवल लाभ एवं बीसीआर उच्चतर थे (रु.22100/हेक्ट और 2.58)।

2. फ्रण्टलाइन प्रदर्शन

* 9131 फ्रण्टलाइन प्रदर्शनों का आयोजन किया गया, जिनमें अनाजों पर 1075, बाजरा पर 594, तिलहनी फसलों पर 615, दालों पर 533, वाणिज्यिक फसलों पर 255, चारा फसलों पर 98, हरे गोबर फसलों पर 24, सब्जी फसलों पर 983, कंदिल फसलों पर 110, फल फसलों पर 574, फूलों पर 123, मसाला फसलों पर 227, बागान फसलों पर 282 एवं चिकित्सीय फसलों पर 25 सम्मिलित थे।
* इसके अलावा, विभिन्न फसलों के संकरों पर 1344, खेत औजारों पर 582, पशुधन एवं मत्स्य पालन पर 610 एवं कर्नाटक, तमिलनाडु, केरल, गोवा, और पुदुच्चेरी तथा लक्षद्वीप संघ राज्यों में 3576.77 हेक्ट के क्षेत्र को व्याप्त करते उद्यमों पर 568 आयोजित किए गए।

3. दक्षता विकास

* रिपोर्टाधीन वर्ष के दौरान, 327112 व्यक्तियों के लिए 9626 प्रशिक्षण कार्यक्रम आयोजित किए गए, जिनमें से 35 % महिलाएँ थीं और 19.26 % प्रतिभागी अ.जा./अ.ज.जा. का प्रतिनिधित्व करते थे। अधिकांश प्रशिक्षण पाठ्यक्रम (5950 सं.) किसानों/कृषक महिला कोटि के लिए थे, जिसमें दो लाख से भी अधिक किसानों/ कृषक महिलाओं को प्रशिक्षित किया गया। अधिकांश प्रशिक्षण क्षेत्र फसल उत्पादन (1335 पाठ्यक्रम) और सस्य संरक्षण (८४० पाठ्यक्रम) में थे। मृदा स्वास्थ्य एवं उर्वरता प्रबंधन भी 532 पाठ्यक्रमों के साथ प्रशिक्षण का प्रधान क्षेत्र रहा। बागबानी फसलों में, 474 पाठ्यक्रमों के साथ सब्जी फसल खेती प्रधान प्रशिक्षण क्षेत्र रहा। पशुधन उत्पादन एवं प्रबंधन अगला महत्वपूर्ण प्रशिक्षण क्षेत्र रहा, जिसमें 16663 किसानों को 463 पाठ्यक्रम दिए गए। ग्रामीण युवाओं के लिए आयोजित प्रशिक्षण पाठ्यक्रमों में (805 पाठ्यक्रम, 24403

प्रतिभागी) समेकित खेती-बाड़ी (185 पाठ्यक्रम), मूल्य वर्धन (98 पाठ्यक्रम), खुमी उत्पादन (71 पाठ्यक्रम), कृमि-संवर्धन (44 पाठ्यक्रम) तथा जैव उत्पाद (39 पाठ्यक्रम) शामिल थे।

* **१६७३२** विस्तरण कार्यकर्ताओं के लिए कुल **४८९** पाठ्यक्रमों का आयोजन किया गया। विभिन्न प्रशिक्षण क्षेत्रों में से, खेती फसलों में उत्पादकता वृद्धि (129 पाठ्यक्रम और 4847 प्रतिभागी**)** एवं एकीकृत नाशी जीव प्रबंधन **(९३** पाठ्यक्रम और 3114 प्रतिभागी) प्रधान क्षेत्र रहे।
* नियमित प्रशिक्षण पाठ्यक्रमों के अलावा, कृ.वि.कें. द्वारा 74544 प्रतिभागियों के लाभार्थ 20 विभिन्न क्षेत्रों में 2098 प्रायोजित पाठ्यक्रमों का आयोजन किया गया। अत्यधिक प्रशिक्षण पाठ्यक्रमों का आयोजन फसलों का वर्धित उत्पादन तथा उत्पादकता (561) एवं स्थल पर निवेशों के उत्पादन (265 पाठ्यक्रम) पर था। वर्ष के दौरान कुल 28**४ व्**यावसायिक पाठ्यक्रमों का आयोजन 6979 प्रतिभागियों के लिए किया गया, जिनमें, अधिकांशतया ग्रामीण युवा शामिल थे। विभिन्न व्यवसायों के बीच, खुमी उत्पादन प्रशिक्षण का प्रधान क्षेत्र था **(३८** पाठ्यक्रम) एवं मूल्य वर्धन **(३३** पाठ्यक्रम)।

4. फ्रण्टलाइन विस्तरण कार्यक्रम

* कृ.वि.कें. ने कुल 1.45 लाख विस्तार कार्यक्रमों का आयोजन किया और उपजातीय निष्पादन, उत्पादन प्रौद्योगिकियाँ, एकीकृत नाशी जीव एवं रोग प्रबंधन, पशु स्वास्थ्य एवं पोषण, कुक्कुट, मत्स्यकी एवं मानव पोषण की उत्पादन प्रौद्योगिकी जैसे कृषि तथा संबंधित क्षेत्रों की विभिन्न पहलुओं पर **३८.५३** लाख किसानों और **२.०७ लाख विस्**तार कार्यकर्ताओं एवं सार्वजनिकों के बीच जागृति पैदा की **।** साथ ही, कृ.वि.कें. ने विस्तार साहित्य (5593), समाचार पत्रों (2461), लोकप्रिय लेखों (619), रेडियो वार्ताओं (578) तथा टीवी वार्ताओं (467) के द्वारा संगत प्रौद्योगिकियों का प्रचार किया। कृ.वि.कें. ने विभिन्न प्रौद्योगिकियों पर 242 वीडियो सीडी/डीवीडीयों को विकसित किया तथा बिक्री के लिए उन्हें किसानों एवं अन्य साझेदारों को उपलब्ध कराया।

5. प्रौद्योगिकीय निष्कर्षों का उत्पादन

* कृ.वि.कें. ने विभिन्न फसल प्रकारों एवं संकरों के 638 टन बीजों, विभिन्न फसलों एवं संकरों के 60 लाख रोपण सामग्री, 303 टन जैव-उत्पादों एवं 1.7 लाख पशुधन नस्लों और छोटी मछलियों का उत्पादन कर वितरित किया, जिससे 4.2 लाख किसान लाभान्वित हुए।
* कृ.वि.कें. ने 70600 पैरासिटाइड एसिरोफागस पपाई**,** 22550 ईपीएन, **१६५३१ फरमोन ट्रैप एवं** 1382 ट्राइको कार्डों का उत्पादन कर वितरित किया जिससे करीब 80000 किसान रसायनों के उपयोग को घटाकर जैव-नियंत्रण को अपनाने के लिए प्रेरित हुए।

6. मिट्टी, जल और पौधों की जाँच का विश्लेषण

* मण्डल में किसानों को विश्लेषणात्मक सेवाएँ उपलब्ध कराने के लिए 67 कृ.वि.कें. में मृदा, जल तथा पौधा परीक्षण प्रयोगशालाओं को स्थापित किया गया है। 13438 गाँवों के 39448 किसानों से प्राप्त किए गए मृदा, जल, पौधा तथा खाद के कुल 48199 नमूनों का विश्लेषण किया गया तथा उन किसानों को समुचित सलाहों के साथ निष्कर्ष उपलब्ध कराए गए।

7. वर्षा जल संग्रहण इकाइयाँ

* किसानों एवं विस्तार कार्यकर्ताओं के लाभार्थ कृ.वि.कें. द्वारा स्थापित सोलह वर्षा जल संग्रहण इकाइयों, 74 दक्षता विकास कार्यक्रमों और 57 प्रदर्शनों का आयोजन किया गया। इसके अलावा, इन इकाइयों की मदद से 1.7 लाख रोपण सामग्रियों को तैयार किया गया। साथ ही, 34१८१ किसानों एवं ८६९ कर्मचारियों ने इन इकाइयों का दौरा किया ।

8. कृषि विज्ञान केंद्रों की समाभिरूपता एवं संयोजन

* मण्डल के अधिकांश जिलों में कृ.वि.कें. ने कृषि प्रौद्योगिकी प्रबंधन अभिकरण (आत्मा) के साथ निकट सहयोग में काम किया। वर्ष के दौरान कृ.वि.कें. ने आत्मा के 2052 कार्यक्रमों में भाग लिया और साथ ही आत्मा के सहयोग से 628 कार्यक्रमों का आयोजन किया। राष्ट्रीय/राज्य बागबानी कार्य(एनएचएम/एसएचएम) के अंतर्गत, कृ.वि.कें. निम्नों की स्थापना में सहायक रहे (क) 10 कृ.वि.कें. में उत्तम गुणता की रोपण सामग्रियों के उत्पादन के लिए लघु पौधा घर/ आदर्श पौधा घर, (ख) तीन कृ.वि.कें. में ऊतक संवर्धन प्रयोगशाला, खुमी उत्पादन इकाई और जैव-नियंत्रण प्रयोगशाला।
* करीब २४ कृ.वि.कें. को विभिन्न क्रियाकलापों के लिए आरकेवीवाई के अंतर्गत रु.662.59 लाखों तक की वित्तीय सहायता उपलब्ध कराई गई। राज्य कृषि विभागों ने प्रशिक्षण, प्रदर्शन तथा संगोष्ठियों के लिए कृ.वि.कें. को रु.748.57 लाखों तक की वित्तीय सहायता उपलब्ध कराई। राष्ट्रीय कृषि एवं ग्रामीण विकास बैंक (नाबार्ड) ने उद्यम विकास कार्यक्रमों के संचालन के लिए 13 कृ.वि.कें. को रु.119.63 लाखों की वित्तीय सहायता उपलब्ध कराई।

9. सफल मामले: एक झांकी

* कृ.वि.कें. तिरुवारूर के प्रयासों से जिले में 400-500 किसानों द्वारा बौनी छोटी मछलियों के अपनाए जाने से उन्होंने प्रतिवर्ष बौनी छोटी मछलियों को बेचने से रु. 5-10 लाख की कमाई की व साथ ही साल भर मज़दूरों को रोजगार भी मिला।
* कृ.वि.कें. पुदुच्चेरि के प्रयासों के परिणामस्वरूप, मुथियालपेट के टीएमटी.डी.षण्मुगवदन तथा सरम की टीएमटी.जनमाला द्वारा गृह/लघु प्रक्रमण इकाइयों की स्थापना की गई। टीएमटी.डी.षण्मुगवदन 4 प्रकार के शरबत, यथा, आम्ला, अमरूद, अंगूर और मोसम्बी के कुल 275 लीटरों का उत्पादन करते हैं तथा अतिरिक्त आमदनी के तौर पर रु.15500 प्रति माह का निवल लाभ पाते हैं। जबकि टीएमटी.जनमाला 8 किग्रा अचार, 500 लीटर फलों का शरबत और 9 किग्रा मुरब्बा के उत्पादन से रु.5000 प्रति माह का निवल लाभ पाती है।
* श्री बीनु और श्री कन्नदास ने कृ.वि.कें. कालिकट के तकनीकी मार्गदर्शन में मुत्तुकाड में केरा बोके की उत्पादन इकाई स्थापित की और उस जिले, अन्य जिले एवं अन्य राज्यों से विवाहोत्सव जैसे रस्मी समारोहों के लिए मांग आदेश पर केरा बोके के अनेक डिजाइन तथा अनौपचारिक शुष्क बोके तैयार करते हैं जिससे वे रु.2500-3000 प्रति माह का अतिरिक्त आय कमाते हैं, क्योंकि वे अपना खाली समय इकाई को चलाने में ही बिताते हैं।
* कोडुंगल्लोर से 50 वर्ष आयु के श्री सुकुमारन, मूनुत्तुरुत्तिल एक पारम्परिक मछुए थे जिन्होंने 2012 में कृ.वि.कें. संकाय के तकनीकी मार्गदर्शन में ड्रायर तथा अन्य उपस्कर के साथ लघु झींगा संसाधन इकाई स्थापित की। सम्प्रति, यह इकाई मूल्य वर्धित उत्पादों को तैयार कर रही है, जैसे, पकाने के लिए तैयार सुखाए गए झींगा, झींगा चटनी पाउडर तथा सिका हुआ झींगा और ये कायल चेम्मीन के ब्राण्ड नाम से बेचे जा रहे है एवं रु.18000 प्रति माह का निवल आय प्राप्त हो रहा है। श्री सुकुमारन सम्प्रति अपनी संसाधन इकाई में पाँच महिला मज़दूरों के नियोक्ता हैं।

10. पुरस्कार एवं मान्यताएँ

* कृ.वि.कें.,बेंगलूर ग्रामीण (यूएएसबी), कर्नाटक को वर्ष 201२ के लिए भारतीय कृषि अनुसंधान परिषद का सर्वोत्तम क्षेत्रीय केवीके पुरस्कार प्राप्त हुआ है।

11. कृषि प्रौद्योगिकी सूचना केन्द्र (एटीआईसी)

* एटीआईसी ने २४८१० किसानों को प्रौद्योगिकी सेवाएँ उपलब्ध कराई है, साझेदारों को ८८७.५१क्विं बीज, ३९२४२१ रोपण सामग्रियाँ तथा

४७.८१ क्विं जैव-उत्पादों को उपलब्ध कराया और किसानों से प्राप्त **१४६१** पत्रों के उत्तर के द्वारा सूचना सहायता उपलब्ध कराई एवं किसानों की शंकाओं के समाधान के लिए 63**१३८२ उत्तर दिए**।

* साथ ही, एटीआईसी द्वारा किसानों को कुल 25**१६१** किताबें एवं **४६७८** तकनीकी बुलेटिन, **२७४** सीडी, **४५** प्रौद्योगिकी सूची, **५** वीडियो फिल्में व श्रव्य सीडी उपलब्ध कराए गए जिससे **२९२८** किसान लाभान्वित हुए।
* इन सेवाओं के द्वारा एटीआईसी ने रु.**१२.८७** लाख का राजस्व अर्जित किया।

12. विस्तार निदेशालय द्वारा प्रौद्योगिकी का समर्थन

* विस्तार निदेशालय ने 57 प्रशिक्षण कार्यक्रमों का आयोजन किया तथा क्षेत्र **VIII** में 75 कृ.वि.कें. से 587 कृ.वि.कें. स्टाफ को प्रशिक्षित किया। साथ ही, निदेशालय ने 41 कार्यशालाओं/बैठकों/ संगोष्ठियो का आयोजन किया जहॉ पर उनके अधिकार क्षेत्र में कृ.वि.कें. के क्रियाकलापों की निगरानी की गई।
* विस्तार निदेशालय एवं उनके वैज्ञानिकों ने कृ.वि.कें. द्वारा आयोजित 74 एसएसी बैठकों, 38 प्रौद्योगिकी सप्ताहों, 40 प्रशिक्षण कार्यक्रमों, 32 क्षेत्र दिवस, 25 विस्तार क्रियाकलाप एवं 14 खेत क्षेत्र स्कूलों में भाग ली। आगे, उन्होंने कृ.वि.कें. के ओएफटी और एफएलडी के क्रमश: 100 एवं 244 भूखंडों का दौरा किया। उन्होंने सफलता गाथाएँ/ मामला अध्ययनों पर 27 दस्तावेजों को तैयार करने में कृ.वि.कें. का मार्गदर्शन भी किया है।
* विस्तार निदेशालय ने 71 कृ.वि.कें. को कुल 9.37 टन बीज, 48 कृ.वि.कें. को करीब एक लाख रोपण सामग्रियॉ, 71 कृ.वि.कें. को 12.73 टन जैव-उत्पाद, 17 कृ.वि.कें. को 1730 पशुधन, 14 कृ.वि.कें. को 14900 कुक्कुट पक्षियॉ, एवं 8 कृ.वि.कें. को 30.07 पोषण मिश्रण उपलब्ध कराया।

13. विशेष कार्यक्रम

* **२०१३-१४** के दौरान, कालादाल, हरादाल, अरहर तथा चना जैसे प्रमुख दलहन फसलों पर 509 प्रदर्शन संचालित किए गए जो देश में दलहन उत्पादन को सशक्त बनाने के लिए प्रौद्योगिकी प्रदर्शन के अंतर्गत कर्नाटक एवं तमिल नाडु राज्यों की दलहन खेतीबारी के एनएफएसएम क्रियान्वयक जिलों में 211.60 हेक्ट के क्षेत्र में व्याप्त था ।
* एनआईसीआरए के अंतर्गत, **१४२२** किसानों को शामिल करते हुए एनआरएम से संबंधित कदमों से **१७४.३१ हेक्ट** क्षेत्र का उपचार किया गया, **१०१०** किसानों ने 455.04 हेक्ट क्षेत्र (फसल में वृद्धि अलेप्पि में 8.12 प्रतिशत से लेकर बेलगाम जिले में 31.33 प्रतिशत तक की श्रेणी में थी) में बहु संख्यक फसल प्रौद्योगिकियों का प्रदर्शन किया, 4029 पशुओं, 205 कुक्कुट पक्षियों के लिए टीके के साथ पशुओं की 57**५** सुधरी नस्लों को पेश किया, वर्मीकम्पोस्टिंग तथा अज़ोला की 49 इकाइयों को स्थापित की और समुदाय भूमि में **२७.५** हेक्ट को सुधरी चारा खेतीबारी के अंतर्गत लाया गया, सूखे से संबंधित परिस्थितियों से जूझने के लिए **४३.७** हेक्ट क्षेत्र को बीज एवं चारा बैंक के तौर पर विकसित किया गया, गॉवों में प्रौद्योगिकी अभिग्रहण एवं उत्पादों के विपणन में बेहतर समन्वयन के लिए 21 समुदाय समूहों को बनाया गया, समयबद्ध खेत प्रचालनों को सम्पन्न करने के लिए गॉववालों के द्वारा अपेक्षानुसार भाडे पर औजार प्राप्ति के अंतर्गत विभिन्न साधनों द्वारा 385.8 हेक्ट क्षेत्र की खेतीबारी की गई है।

14. मण्डलीय परियोजना निदेशालय के क्रियाकलाप

* जीकेवीके कैम्पस, कृषि विज्ञान विश्वविद्यालय, बेंगलूर में 23-25 अक्तूबर, 2013 के दौरान कृ.वि.कें. पर 8 वें राष्ट्रीय सम्मेलन के आयोजन में निदेशालय सक्रिय रूप से संलग्न था। इसके अलावा, निदेशालय ने उक्त सम्मेलन के संबंध

में प्रौद्योगिकी प्रदर्शिनी-सह-उद्यम बाजार के आयोजन में समन्वयन कार्य किया।

* निदेशालय ने 30 सितम्बर, 2013 को सस्यों की विविधता का संरक्षण एवं किसानों का अधिकार अधिनियम 2001 पर जागृति कार्यशाला का आयोजन किया जिसमें मण्डल **VIII** के **३३** कृ.वि.कें. ने भाग ली।
* निदेशालय ने कृ.वि.कें, हासन में प्रौद्योगिकी मूल्यांकन, परिष्करण तथा प्रदर्शन पर अभिविन्यास प्रशिक्षण पाठ्यक्रम का आयोजन किया तथा मण्डल **VIII** के **२५** नए भर्ती कृ.वि.कें, के स्टाफ को प्रशिक्षित किया। आगे, कृ.वि.कें, कोयम्बत्तूर में प्रशासन एवं लेखाकरण क्रियाविधियों पर प्रशिक्षण पाठ्यक्रम का आयोजन किया, जिसमें मण्डल **VIII** के कृ.वि.कें, के 21 प्रशासनिक स्टाफ को प्रशिक्षित किया गया।
* निदेशालय ने **९४** कार्यक्रम समन्वयक, **५२३** विषय विशेषज्ञ, **६५** कार्यक्रम सहायक तथा **११** प्रशासनिक स्टॉफ युक्त कुल 69**३** कृ.वि.कें. के स्टाफ को कृषि तथा संबद्ध क्षेत्रों के विभिन्न पहलुओं एवं प्रशासनिक और लेखाकरण प्रक्रियाओं पर मानव संसाधन विकास कार्यक्रमों में भाग लेने के लिए प्रतिनियुक्त किया।
* कुल 8 लेख/रिपोर्टे/कागजात प्रकाशित किए गए, **१४ बैठक/कार्यशालाओं का आयोजन किया गया एवं मण्**डल परियोजना निदेशक एवं निदेशालय के स्टाफ ने 9 बैठकों/कार्यशालाओं/सम्मेलनों/संगोष्ठियों, 74 एसएसी बैठकों एवं 38 प्रौद्योगिकी सप्ताहों में भाग ली। इसके अलावा, कृ.वि.कें. के स्टाफ ने कृषि तथा उसके संबद्ध क्षेत्रों के विभिन्न प्रौद्योगिकीय पहलुओं पर 261 शोध लेख, 200 तकनीकी बुलेटिन, 637 लोकप्रिय लेख, 79 समाचार पत्र दर्ज कर प्रकाशित किया।

Executive Summary

The Indian Council of Agricultural Research (ICAR) has established the network of Krishi Vigyan Kendras (KVKs) at district level under different host organizations viz., ICAR Institutes, State Agricultural Universities (SAUs), Non-Governmental Organizations (NGOs), Deemed Universities (DUs) and State Department of Agriculture (SDA). As on March 31, 2014, 638 KVKs were established in the country, out of which 81 KVKs are in Zone VIII. The Zonal Project Directorate-Zone VIII coordinates, plans, monitors and evaluates the technological interventions and frontline extension programmes of 81 KVKs in Karnataka (31), Tamil Nadu (30), Kerala (14), Puducherry (3), Goa (2) and Lakshadweep (1).

Assessment, refinement and demonstration of technologies are carried out by the KVKs with technological backstopping from SAUs and ICAR Institutes in partnership with farmers and other stakeholders. KVKs organize need-based capacity development programmes for its stakeholders and create awareness about improved agricultural technologies through appropriate frontline extension programmes. Production and supply of quality seeds, planting material, livestock breeds, animal products and bio-products are also being undertaken to facilitate initial uptake of technologies. KVKs are serving as knowledge and resource centres of agricultural technology to support the initiatives of public, private and voluntary sectors for improving agricultural economy of the district. Salient achievements during the year (2013-14) are summarized as follows:

1. Technology Assessment and Refinement

* A total of 301 technologies were assessed and 10 technologies refined by KVKs through 1973 OFTs at 361 locations. Out of these 88% of technologies were under crops and 11% under livestock, poultry and fisheries sectors.

* Under crops, a total of 264 technologies were assessed, of which a large number of technologies assessed in varietal evaluation (75) followed by integrated disease management (39), integrated nutrient management (33), integrated crop management (26), cropping system (25), integrated pest management (23), resource conservation technologies (17), integrated pest and disease management (12), farm machinery (04), processing and value addition (03), drudgery reduction (02), seed/planting material production (02), weed management (02) and storage technique (01). Nine technologies were refined in various thematic areas such as cropping system (01), farm machineries (03), resource conservation technology (02), seed/planting material production (02) and drudgery reduction (01).

* Under animal husbandry, a total of 33 technologies were assessed, of which 13 technologies in production and management, followed by disease management (10) and nutrition management (10).

* High yielding variety of chickpea cv. - JG-14 yielded well in all the three districts of North Karnataka *viz.,* Belgaum, Bellary and Bidar with 8.78 q/ha, 15.50 q/ha and 15.00 q/ha, respectively and gave net return of Rs.18830/ha, Rs.26800/ha and Rs. 25750/ ha with BCR 4.28, 2.61 and 2.34, respectively.

* Groundnut cv. Kadiri-6 realized better yield of 17.00 q/ha and 16.67 q/ha gave net return of Rs. 16780/ha and Rs. 23480/ha with BCR 1.45 and 1.68 at Haveri and Gadag districts respectively.

* Bhima Super variety of onion gave higher yield at Koppal (320 q/ha) and Dharwad (380 q/ha), whereas Arka Kalyan realized higher yield in Bellary (310 q/ha) and Haveri (210 q/ha). Net return was ranging between Rs.1.20 lakh/ha to Rs.1.80 lakh/ha and the BCR was 4.57 at Koppal, 9.50 in Dharwad and 8.40 in Haveri.

* Cowpea cv. Bhagyalaxmi yielded 125 q/ha as against cv. Kashi Kanchan (98.90 q/ha) in Kozhikode district and gave net return of Rs.61850/ha with 2.62 BCR.

However cv. Kashi Kanchan realized higher net return of Rs.75340/ha with 2.73 BCR, due to better market price. In Thrissur district, cv. Lola gave highest yield of 150 q/ha with net return of Rs.270000/ha and 1.82 BCR followed by cv. NS 621 (148 q/ha yield; Rs.262600/ha net return and 1.79 BCR).

* Paired row planting with a spacing of 1.2 x 1.2 m X 2 m performed better in both Koppal and Kodagu districts. Net return of Rs.1029000/ha were realized through yield of 135 t/ha with 8.22 BCR in Koppal followed by net returns of Rs. 308000 through 50 t/ha and 3.75 BCR in Kodagu. The results confirmed that paired row of planting system in banana is highly profitable in both the districts.

* Application of methylo bacterium in blackgram gave more yield (7.8 q/ha) in Theni followed by 7.2 q/ha in Tuticorin. However, net return and BCR were higher at Tuticorin (Rs.22100/ha and 2.58) as compared to Rs.17000/ha and 1.66 at Theni, due to lower cost of cultivation.

2. Frontline Demonstrations

* 9131 frontline demonstrations were organized including 1075 on cereals, 594 on millets, 615 on oilseeds, 533 on pulses, 255 on commercial crops, 98 on fodder crops, 24 on green manure crops, 983 on vegetable crops, 110 on tuber crops, 574 on fruit crops, 123 on flowers, 227 on spice crops, 282 on plantation crops and 25 on medicinal crops.

* Besides, 1344 on hybrids of various crops, 582 on farm implements, 610 on livestock and fisheries and 568 on enterprises covering an area of 3576.77 ha in the states of Karnataka, Tamil Nadu, Kerala, Goa, and UTs of Puducherry and Lakshadweep were organized.

3. Capacity Development

* During the year under report, 9626 training courses were organized for 327112 persons, out of which, 35 % were women and 19.26 % of the participants represented SC/ST category. Majority of the training courses (5950 nos.) were for farmers/farm women category in which more than two lakh farmers/farm women were trained. The major training areas for farmers/farm women category were crop production (1335 courses) and plant protection (840 courses). Soil health and fertility management was also a major area of training with 532 courses. In horticulture crops, vegetable crop cultivation with 474 courses was the leading training area. Livestock production and management was the next important training area with 463 courses for 16663 farmers. Training courses organized for rural youth (805 courses, 24403 participants) included major training areas like integrated farming (185 courses), value addition (98 courses), mushroom production (71 courses), vermi-culture (44 courses) and production of organic inputs (39 courses). A total of 489 courses were organized for 16732 extension functionaries. Among the different training areas, productivity enhancement in field crops (129 courses and 4847 participants) and integrated pest management (93 courses and 3114 participants) were the major areas.

* Besides the regular training courses, 2098 sponsored ones were conducted by the KVKs in 20 different areas for the benefit of 74544 participants. Largest number of training courses were organized on increased production and productivity of crops (561) and production of inputs at site (265 courses). A total of 284 vocational training courses were organized during the year involving 6979 participants, mostly the rural youth. Among the different vocations, mushroom production was the major area of training (38 courses) followed by value addition (33 courses).

4. Frontline Extension Programmes

* KVKs organized a total of 1.45 lakh

extension programmes and created awareness among 38.53 lakh farmers and 2.07 lakh extension personnel and public on various aspects with varietal performance, production technologies, integrated pest and disease management, animal health and nutrition, production technologies of poultry, fisheries and human nutrition. Further, KVKs disseminated relevant technologies through extension literature (5593), newspaper coverage (2461), popular articles (619), radio talks (578) and T V talks (467). KVKs also developed 242 video CDs/DVDs on various technologies and made them available for sale to farmers and other stakeholders.

5. Production of Technological Inputs

* KVKs produced and supplied 638 t of seeds of different crop varieties and hybrids, 60 lakh planting material of different crops and hybrids, 303 t of bio-products and 1.7 lakh livestock strains and fish fingerlings benefiting 4.2 lakh farmers.

* KVKs produced and supplied 70600 number of parasitoid *Acerophagus papayae*, 22550 EPN, 16531 pheromone traps and 1382 Trico cards through which nearly 80000 farmers were motivated to adopt bio-control measures.

6. Soil Water and Plant Testing Analysis

* Soil, water and plant testing laboratories have been established in 67 KVKs for providing analytical services to farmers in the zone. A total of 48199 samples of soil, water, plant and manure received from 39448 farmers belonging to 13438 villages were analyzed and the results along with appropriate advisory have been given to those farmers.

7. Rain Water Harvesting Units

* Sixteen KVKs established rainwater harvesting units, 74 capacity development programmes and 57 demonstrations were conducted for the benefit of farmers and extension functionaries. Besides, 1.7 lakh planting materials were produced by utilizing these units. Further 34181 farmers and 869 officials visited these units.

8. Convergence and Linkages of KVKs

* KVKs worked in close collaboration with Agriculture Technology Management Agency (ATMA) in most of the districts of the Zone. KVKs participated in 2052 programmes of ATMA during the year and at the same time KVKs organized 628 programmes in collaboration with ATMA. Under National/State Horticulture Mission (NHM/SHM), KVKs were instrumental in establishing (a) small scale nurseries/model nurseries for producing quality planting material at 10 KVKs, (b) tissue culture laboratory, mushroom production unit and bio-control laboratory in three KVKs. As many as 24 KVKs were provided with financial assistance to the tune of Rs.662.59 lakh under RKVY for various activities. State agriculture departments provided financial assistance to the tune of Rs.748.57 lakh to KVKs for the purpose of organizing training, demonstrations and seminars. National Bank for Agriculture and Rural Development (NABARD) extended financial assistance of Rs.119.63 lakh to 13 KVKs for conducting entrepreneurship development programmes.

9. Successful cases: A glimpse

* The efforts of KVK Thiruvarur resulted in adoption of stunted fingerlings among 400-500 farmers in the district through which they earned Rs. 5 - 10 lakh through selling of stunted fingerlings per annum as well as provided employment to labourers throughout the year.

* The efforts of KVK, Puducherry resulted in establishment of home/small scale processing units by Tmt. D. Shanmugavadhana belonging to

Muthialpet and Tmt. Janamala belonging to Saram. Tmt.D.Shanmugavadhana produces a total of 275 litres of 4 types of squashes *viz.*, Amla, Guava, Grape and Musambi with a net profit of Rs.15500 per month as an additional income. Whereas, Tmt. Janamala produces 8 kg pickle, 500 litres of fruit squash and 9 kg of jam with a net profit of Rs. 5000 per month.

* Mr. Binu and Mr. Kannadas established a production unit of Kera bouquet at Muthukad under the technical guidance of KVK, Calicut and producing several designs of Kera bouquet on orders from within the district, other districts and other states for ceremonial functions such as bridal and casual dry bouquet through which they earns an additional income of Rs. 2500-3000 per month as they are using their leisure time only for running the unit.

* Mr. Sukumaran, Moonnuthuruthil from Kodungallore aged 50 was a traditional fisherman established small scale prawn processing unit with drier and other equipment in 2012 under the technical guidance of KVK faculty. At present, the unit is making value added products such as ready to cook dried prawn, prawn chutney powder and roasted prawn and selling on the brand name-KAYAL CHEMMEEN and earns a net income of Rs.18000 per month. Mr. Sukumaran has employed five women labours at his processing unit.

10. Awards and Recognization

* KVK Bangalore Rural (UASB) Karnataka bagged the Best Zonal KVK Award for Zone VIII of Indian Council of Agricultural Research for the year 2012.

11. Agricultural Technology Information Centres (ATICs)

* The ATICs have provided technology services to 24810 farmers, supplied 887.51 q seeds, 392421 number of planting material and 47.81 q bio-products to different stakeholders and provided information support through replies of 1461 letters received from farmers and answered 1382 to clarify their doubts.

* Further, a total of 25161 books and 4678 technical bulletins were made available for farmers at ATICs followed by 274 CDs, 45 technology inventory, 5 vedio films and audio CDs benifitting 2928 farmers.

* Through these services, the ATICs have earned revenue of Rs.12.87 lakh.

12. Technology Backstopping by Directorates of Extension

* Directorates of Extension organized 57 training programmes and trained 587 KVK staff from 75 KVKs in Zone VIII. Besides, Directorates organized 41 workshops/meetings/seminars wherein monitored the activities of KVKs in their jurisdiction.

* Directors of Extension and their scientists participated in 74 SAC meetings, 38 technology weeks, 40 training programmes, 32 field days, 25 extension activities and 14 Farm Field Schools organized by KVKs. Further, they visited 100 and 244 plots of OFTs and FLDs of KVKs, respectively. They have also guided the KVKs for preparing 27 documents on success stories/case studies.

* Directorates of Extension provided a total of 9.37 t of seeds to 71 KVKs, about one lakh of planting materials to 48 KVKs, 12.73 t of bio-products to 71 KVKs, 1730 livestock to 17 KVKs, 14900 poultry birds to 14 KVKs, and 30.07 t of nutrient mixtures to 8 KVKs.

13. Special Programmes

* A total of 509 demonstrations on major pulse crops such as blackgram, greengram, pigeonpea and bengalgram covering an area of 211.60 ha were implemented in the pulse growing NFSM implementing districts of Karnataka and

Tamil Nadu states as a special drive under technology demonstration for harnessing pulse production in the country during 2013-14.

* Under NICRA, a total of 174.31 ha area was treated with NRM related treatments covering 1422 farmers, 1010 farmers demonstrated large number of crop technologies in an area of 455.04 ha (increase in yield ranged from 8.12 per cent in Allepey to 31.33 per cent in Belgaum district), introduced 575 number of improved breeds of animals with vaccination for 4029 animals, 205 poultry birds, established 49 units of vermicomposting and azolla and 27.5 ha brought under improved fodder cultivation in the community lands, established 43.7 ha area as seed and fodder bank to meet the drought related situations, 21 commodity groups were formed in the villages for better coordination in technology adoption and marketing of produce, 385.8 ha area has been cultivated through various implements availing implements under custom hiring by the villagers to carry out timely farm operations.

14. Activities at the Zonal Project Directorate

* The Directorate actively involved in conducting 8th National Conference on KVK at GKVK Campus, University of Agricultural Sciences, Bangalore during 23-25 October, 2013. Further, the Directorate coordinated in organization of Technology Exhibition-cum-Entrepreneurs Market in connection with the conference.

* The Directorate organized a sensitization workshop on Protection of Plant Varieties and Farmers Right Act 2001 on 30th September, 2013 in which 33 KVKs of Zone VIII participated.

* Directorate organized orientation training course on Technology Assessment, Refinement and Demonstration at KVK, Hassan and trained 25 newly recruited KVK staff of Zone VIII. Further, organized training course on Administrative and Accounting Procedures at KVK, Coimbatore in which 21 administrative staff of KVKs of Zone VIII were trained.

* The Directorate deputed 693 KVK staff consisting of 94 Programme Coordinators, 523 Subject Matter Specialists, 65 Programme Assistants and 11 Administrative Staff for HRD programmes on various aspects of agriculture and allied sectors and also administrative and accounting procedures.

* A total of 8 articles/reports/papers were published, 14 meetings/workshops were organized and Zonal Project Director and staff of Directorate participated in 9 meetings/workshops/conferences/semi nars, 74 SAC meetings and 38 technology weeks. Further, KVK staff documented and published 261 research papers, 200 technical bulletins, 637 popular articles, 79 news letters on various technological aspects of agriculture and its allied sectors.

Chapter 1
About Zonal Project Directorate

The Agricultural Extension Division, one of the eight divisions of Indian Council of Agricultural Research (ICAR), New Delhi has established a network of Krishi Vigyan Kendras (KVKs) all over the country. The KVKs are hosted by ICAR, SAUs, State Departments of Agriculture and NGOs to assess, refine and demonstrate technologies in agriculture and allied sectors. The Agricultural Extension Division headed by the Deputy Director General (Agricultural Extension) monitors and reviews the progress of KVKs through eight Zonal Project Directorates (earlier known as Zonal Coordinating Units) located across the country. The jurisdiction of Zonal Project Directorates is illustrated in Table 1.

Table 1: Zonal Project Directorates and States

Zones	No. of States/ UTs	States/UTs
I	5	Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir and Punjab
II	4	A & N Islands, Bihar, Jharkhand and West Bengal
III	8	Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura
IV	2	Uttar Pradesh and Uttarakhand
V	2	Andhra Pradesh, Telangana and Maharashtra
VI	2	Rajasthan and Gujarat
VII	3	Chhattisgarh, Madhya Pradesh and Odisha
VIII	6	Karnataka, Tamil Nadu, Kerala, Goa, Puducherry and Lakshadweep

1.1 Genesis

The Indian Council of Agricultural Research (ICAR) established eight Zonal Coordinating Units in September 1979 to monitor and coordinate the Lab to Land Programme (LLP) launched on the occasion of ICAR's Golden Jubilee celebrations (1979). To begin with, Zonal Coordinating Unit-Zone VIII had its office at Tamil Nadu Agricultural University (TNAU), Coimbatore. It was shifted to the campus of the Regional Station of National Dairy Research Institute (NDRI) at Adugodi, Bangalore in September, 1981. The jurisdiction of Zone VIII included Karnataka, Kerala, Tamil Nadu, Puducherry and Lakshadweep. The Unit was converted as a Plan Scheme with additional staff in 1986 and additional objective of monitoring the other Transfer of Technology projects of ICAR viz., KVK, Trainers Training Centre (TTC), National Demonstration Scheme (NDS), Operational Research Project (ORP), Scheduled Caste and Scheduled Tribe Project and Special Project on Oilseeds. During 1990-91, another objective of implementing and monitoring of National Pulse Project was added. At this juncture, Goa was added to the jurisdiction of the Unit. Zonal Coordinating Units were upgraded as Zonal Project Directorates (ZPDs) during the XI Five Year Plan (2009) and Zonal Coordinators were re-designated as Zonal Project Directors with financial and administrative powers akin to Directors of other ICAR institutes.

1.2 Mandate

Mandate of the Zonal Project Directorate is as follows:

- To formulate, implement, monitor and evaluate strategies on technology assessment, refinement and demonstration programme of the Council in the respective zone.
- To initiate, plan, coordinate and execute the extension research to support and improve technology dissemination system.
- To link KVK efforts to strengthen extension approaches viz. consortium, convergence, public -private partnership, farmer-led and market-led extension in the zone.
- To dovetail technology application programmes by coordinating and fostering linkages with technology generation and delivery system and other stakeholders of agriculture development in the zone.
- To make periodical reports to the Deputy Director General (Agricultural Extension), ICAR on work plan, progress and evaluation.
- To perform any other duties that may be assigned by the Council.

1.3 Staff

Total sanctioned staff strength of Zonal Project Directorate- Zone VIII, Bangalore is 18, out of which 15 are filled currently. (Table 2).

Table 2: Staff strength of Zonal Project Directorate-Zone VIII

Category	Sanctioned	Filled
Zonal Project Director (RMP)	1	1
Scientific	6	5
Technical	2	2
Administrative	8	6
SSS (Gr -II)	1	1
Total	18	15

1.4 Organizational Structure

The organizational structure of Zonal Project Directorate-Zone VIII and KVKs functioning in this Directorate is depicted in Fig.1.

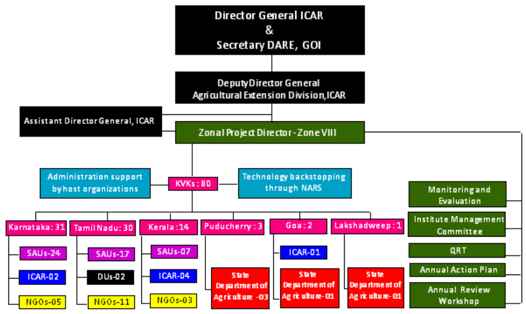

Fig. 1 : Organogram - Zonal Project Directorate, Zone VIII

1.5 Major activities

During 2013-14, Zonal Project Directorate, Zone VIII organized two major activities *viz.,* the eighth national conference on KVKs at the University of Agricultural Sciences, Bangalore and a sensitization workshop on capacity building programmes for farmers and other stakeholders about the Protection of Plant Varieties and Farmers Right Act 2001 at the Directorate. A brief account of the same is furnished below.

1.5.1 Eighth National Conference on Krishi Vigyan Kendra

The Eighth National Conference on Krishi Vigyan Kendra 2013 was organized by

Agricultural Extension Division, ICAR, New Delhi in colloboration with University of Agricultural Sciences, Bangalore and Zonal Project Directorate, Zone VIII, Bangalore from 23rd to 25th October 2013. A total of 637 Krishi Vigyan Kendras have participated in the Conference. The theme of the conference was "Sustainable Intensifciation of Small Holder Farms".

The Conference was inaugurated by His Excellency Shri.H.R. Bharadwaj, Hon'ble Governor of Karnataka in the presence of Hon'ble Union Minister for Agriculture and Food Processing Industry Shri Sharad Pawar, Shri. Siddaramaiah Hon'ble Chief Minister of Karnataka , Shri.T.B. Jayachandra, Minister of Animal Husbandry Government of Karnataka and Shri. Krishna Byre Gowda, Minister of Agriculture, Government of Karnataka.

Eminient scientists and officials of the Department of Agricultural Research and Eductaion (DARE) including Dr. S. Ayyappan, Secretary DARE and Director General ICAR, Shri. Aravind Kaushal, Additional Secretary DARE and Sectetary ICAR, Shri P.K. Pujari, Additional Secretary and Financial Advisor, ICAR, Dr. K.D. Kokate, Deputy Director General (Agricultural Extension), ICAR, other Deputy Director Generals from ICAR, Vice Chancellor, UAS Bangalore and VCs of other State Agricultural Universities participated.

An exhibition was organized during the Conference, in which more than 50 KVKs exhibited their latest technologies on various aspects of agriculture and allied sectors. progressive farmers also participated.

There were eight technical sessions *viz.,* (i) Technological Intensifciation for Higher Yields and Improved Nutrition; (ii) Resilence to Pests, Diseases and Climate for Sustainable Productivity of Small Farms; (iii) Ecological Intensification for Sustainable Cropping / Farming Systems; (iv) Conservation of Agriculture, Farmers Rights and Bio-Diversification of Small Farms; (v) Farmer Centric Approaches, Small Agri-Business Models and Development of Social and Human Capital; (vi) Innovative Experiences of KVKs and Farmers in Sustainable Intensification of Small Farms; (vii) Integration of Livestock and Fisheries Sutaianability of Small Farms and (viii) Experiences of KVKs under NICRA Project in Sustainable Intensifciation of Small Farms. About 45 research papers were presented by scientific and developmental personnel of the National Agricultural Research and Extension Systems.

1.5.2 Sensitization workshop on "Capacity building programmes for farmers and other stakeholders about the Protection of Plant Varieties and Farmers Right Act, (PPVFRA) 2001"

In order to create awareness through KVKs among the farming community on Protection of Plant Varieties and Farmers Right Act 2001, a sensitization workshop was organized by this Directorate on 30th September 2013 under the chairmanship and guidance of Dr. S Nagarajan, Founder Chairperson, PPVFRA. Dr. R.R. Hanchinal, Chairperson, PPVFRA, Dr. R C Agarwal, Registrar General, PPVFRA, Dr. Ravi Prakash, Registrar, PPVFRA, Dr. S. Prabhukumar then Zonal Project Director, Zone VIII, Bangalore participated and delivered the technical aspects on PPVFRA and the role of KVKs in creating awareness to the farmers.

Sensitization workshop in creation of awareness to farmers and other stakeholders in PPVFRA 2001

The workshop was attended by 35 KVKs of Zone VIII. DVDs prepared by the PPVFRA for awareness on the PPVFRA and bio-diversity hot spots of the country were screened for the benefit of the participants. As per the decision taken in the workshop, PPVFRA sanctioned Rs. 80000/- each for these KVKs to conduct capacity building programme for farmers and other stakeholders.

1.6 Budget

A total of Rs. 6875 lakh was sanctioned for the year 2013-14 and 100% of the sanctioned budget was incurred as expenditure. Headwise details of budget and expenditure are furnished in Table 3.

1.7 Rainfall pattern during 2013-14

During the year, except in Tamil Nadu and Puducherry, where the share of north east monsoon is significant in the total annual rainfall, Karnataka, Kerala, Goa and Lakshadweep received normal or excess rainfall. The following Table indicates that the deficit during north east monsoon was 33% in Tamil Nadu and 45% in Puducherry.

Table 3 : Headwise budget and expenditure of Zone VIII for 2013-14 (Rs. in Lakh)

Heads	Sanction				Expenditure			
	ZPD	KVKs	Support to DEE at SAUs	Total	ZPD	KVKs	Support to DEE at SAUs	Total
(A) Recurring								
Pay & Allowance	159.0	5356.5	0.0	**5515.6**	159.0	5356.6	0.0	**5515.6**
T.A	18.0	116.8	6.4	**141.2**	18.0	116.8	6.4	**141.2**
HRD	0.0	0.0	4.9	**4.9**	0.0	0.0	4.9	**4.9**
Contingencies	74.0	867.6	26.4	**968.0**	74.0	867.6	26.4	**968.0**
Total	**251.0**	**6341.0**	**37.7**	**6629.7**	**251.0**	**6341.0**	**37.7**	**6629.7**
(B) Non Recurring								
Works	0.0	236.1	0.0	**236.1**	0.0	236.1	0.0	**236.1**
Furniture & Equipment	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Vehicle	0.0	9.2	0.0	**9.2**	0.0	9.2	0.0	**9.2**
Library	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Revolving Fund	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Total	**0.0**	**245.3**	**0.0**	**245.3**	**0.0**	**245.3**	**0.0**	**245.3**
(C) Special Programmes								
Soil Testing Labs	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Minimal Processing Units	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Rain Water Harvesting Units	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Portable Carp Hachery	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Plant Diagnostic Centre	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Grand Total (A+B+C)	**251.0**	**6586.3**	**37.7**	**6875.0**	**251.0**	**6586.3**	**37.7**	**6875.0**

State	South West Monsoon Rainfall (mm			North East Monsoon Rainfall (mm)		
	Actual	Normal	% deviation	Actual	Normal	% deviation
Karnataka	977.10	832.30	17.00	134.60	188.10	-28.00
Kerala	2570.30	2039.60	26.00	430.70	480.70	-10.00
Tamil Nadu	319.00	221.20	-1.00	294.30	440.40	-33.00
Goa	3498.40	2914.30	20.00			
Puducherry	557.40	352.50	58.00	499.80	915.60	-45.00
Lakshadweep	1056.90	998.50	6.00	177.60	333.60	-47.00

Source: Indian Meterological Department, Chennai, Bangalore and Thiruvananthapuram

Chapter 2
About Krishi Vigyan Kendras

KVKs are knowledge and resource centres of agriculture and its allied sectors which aim at assessing and demonstration of location specific technological modules through technology assessment, refinement and demonstration. They are the agricultural knowledge centres for farmers, farm women, rural youth and extension functionaries. They perform mandated activities keeping in viewtheir stakeholders as partners. The first KVK was started in 1974 and by the end of the March 2014, the number of KVKs has grown to 639 in the country.

2.1 Establishment of KVKs

Based on the recommendation of Education Commission (1964-66), consideration/review by Planning Commission and Inter-Ministerial Committee, and further recommendation by a committee headed by Dr. Mohan Singh Mehta appointed by ICAR in 1973, the idea of establishment of Farm Science Centre (Krishi Vigyan Kendra) was evolved. Subsequently, the first KVK was established in 1974 at Puducherry on pilot basis under the administrative control of Tamil Nadu Agricultural University, Coimbatore. The XI Five Year Plan envisaged establishing additional KVK in larger districts. Zone VIII has the privilege of establishing first additional KVK in Tumkur district, Karnataka under Indian Institute of Horticultural Research, Bangalore.

The Zonal Project Directorate-Zone VIII, earlier known as Zonal Coordinating Unit-Zone VIII, started with establishing, monitoring and coordination of 8 KVKs during V Five Year Plan. During VI, VII, VIII, X and XI Five Year Plans, 7, 5, 20, 34 and 6 KVKs were established respectively. During the period under report, KVK in Kolar district was established in Karnataka, taking the number of KVKs in the Zone to 81 under different host organizations viz., ICAR, SAUs, NGOs, DUs and State Department of Agriculture and functioning in Zone VIII. The state-wise and host organization-wise distribution is presented in Table 4.

Table 4 : Distribution of KVKs - State and host organization-wise

States	Host organizations					Total
	SAUs	NGOs	ICAR Research Institutes	DUs	SDA	
Karnataka	24	5	2	-	-	31
Tamil Nadu	17	11	-	2	-	30
Kerala	7	3	4	-	-	14
Goa	-	-	1	-	1	2
Puducherry	-	-	-	-	3	3
Lakshadweep	-	-	-	-	1	1
TOTAL	**48**	**19**	**7**	**2**	**5**	**81**

SAU - State Agricultural Universities, NGO - Non-Governmental Organizations, ICAR - Indian Council of Agricultural Research, DU- Deemed Universities, SDA- State Department of Agriculture

2.2 Mandate

Krishi Vigyan Kendras aim at technology assessment, refinement and demonstration of technology/products to cater the needs of farming community, extension personnel and other stakeholders in the district. In order to accomplish this, KVKs are carrying out the following activities.

- Conducting on-farm testing to identify the location specificity of agricultural technologies under various farming systems.
- Organizing frontline demonstrations to establish production potential of various crops and enterprises on the farmers' fields.

- Organizing need based training for farmers to update their knowledge and skills in modern agricultural technologies related to technology assessment, refinement and demonstration, and training of extension personnel to orient them in the frontier areas of technology development.
- Creating awareness about improved agricultural technologies among various clienteles through appropriate extension programmes.
- Production of 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 technology to support the initiatives of public, private and voluntary sectors for improving the agricultural economy of the district.

2.3 Manpower

The approved strength of manpower at each KVK is 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 81 KVKs of Zone VIII is 1296, out of which 1103 (85.11 %) are in position. Details of state-wise and category-wise staff strength of KVKs are furnished in Table 5.

Table 5 : State wise and category wise staff strength of KVKs

Category	Karnataka (31 KVKs)		Tamil Nadu (30)		Kerala (14)		Goa (2)		Puducherry (3)		Lakshadweep (1)		Total (81)	
	S	F	S	F	S	F	S	F	S	F	S	F		F
Programme Coordinator	31	30	30	27	14	13	02	02	03	01	01	0	81	73
Subject Matter Specialist	186	163	180	162	84	70	12	09	18	11	06	04	486	419
Programme Assistant	93	77	90	81	42	29	06	04	09	04	03	0	243	195
Administrative	62	57	60	59	28	22	04	02	06	03	02	02	162	145
Driver	62	54	60	58	28	19	04	03	06	02	02	02	162	138
Supporting	62	54	60	58	28	14	04	02	06	03	02	02	162	133
Total	496	435	480	445	224	16	32	22	48	24	16	10	1296	1103
Percentage vacancy	**12.31**		**5.69**		**19.05**		**31.25**		**50.00**		**37.50**		**14.89**	

S-Sanctioned F-Filled Figures in parenthesis is number of KVKs

2.4 Infrastructure at KVKs

Out of 81 KVKs in Zone VIII, 77 KVKs have administrative building, 68 KVKs have farmers' hostel and there are 301 staff quarters in 49 KVKs, 150 demonstration units in 52 KVKs, 20 KVKs have established Rain Water Harvesting Units, 37 KVKs have e-connectivity, 67 KVKs have Soil and Water Testing Labs, 10 KVKs have Portable Carp Hatchery, 4 KVKs have Minimal Processing Units, 31 KVKs have Plant Health Diagnostic Labs. In the case of vehicles, 78 KVKs have jeep and there are 161 two wheelers.

A view of KVK administrative building

Table 6 : State wise details of infrastructure in KVKs

Infrastructure	Karnataka (31)	Tamil Nadu (30)	Kerala (14)	Goa (2)	Puducherry (3)	Lakshadweep (1)	Total (81)
Administrative building	29	30	14	02	02	0	**77**
Farmers hostel	27	29	09	02	01	0	**68**
Staff quarters	102	148	45	06	0	0	**301**
Demo units	41	70	27	08	04	0	**150**
Rainwater harvesting unit	10	03	06	01	0	0	**20**
e -Connectivity	11	14	10	01	01	0	**37**
Soil & water testing lab	24	27	13	01	01	01	**67**
Portable carp hatchery	04	02	02	0	02	0	**10**
Minimal Processing unit	01	01	02	0	0	0	**4**
Plant health diagnostic lab	09	16	05	0	1	0	**31**
Jeep	31	30	13	02	02	0	**78**
Two wheeler	63	60	28	02	05	03	**161**

Figures in parenthesis is number of KVKs

2.5 Scientific Advisory Committee

Scientific Advisory Committee (SAC) is the advisory body, which guides and reviews KVK activities. Head of host organization is the Chairman and other members include Zonal Project Director, Director of Extension, officials from all development departments of the district, representatives from SHGs and progressive farmers. SAC discusses the progress of work done as per mandate and provide guidance for future activities. A total of 74 SAC meetings were conducted by 69 KVKs during the year.

2.6 Revolving fund

Revolving Fund is in operation at 72 KVKs of the Zone VIII. The KVKs are utilizing revolving fund for production of technological products and the net balance as on March 31st 2014 was Rs.5.94 crores. During the reporting period, a net balance of more than Rs.20 lakh was there with seven KVKs. Another 12 KVKs have a balance in the range of Rs.10 to 20 lakh. Net balance in other KVKs ranged from Rs.4 to 10 lakh in 28 KVKs, Rs.1 to 3 lakh in 22 KVKs and less than Rs. one lakh in 3 KVKs.

2.7 Thrust areas

As per the agro-ecological conditions and existing cropping & farming systems, KVKs are broadly working on the following identified thrust areas:

- Introduction and up-scaling of improved varieties/ hybrids of crops and livestock breeds through technical and quality input back-up
- Sustainable crop production through integrated nutrient management and organic farming strategies
- Integrated pest and disease management
- Development and promotion of crop diversification and alternate land use system
- Empowerment of women and youth in terms of improved nutrition, income generation and drudgery reduction through technological literacy
- Scientific management of dairy and small livestock
- Promotion of horticulture as a mechanism of crop diversification, augmenting family and national income
- Value addition, processing and market facilitation of household and commercial enterprises
- Soil, water conservation and watershed management for drought proofing and sustainable rainfed farming
- Small scale mechanization for saving time and reducing cost and drudgery
- Capacity building of rural youth and women to establish self-employment units
- Increasing income from fishery enterprises through production, processing and marketing

Chapter 3
Achievements

3.1 Krishi Vigyan Kendras

Achievements under each of the major activities carried out by the KVKs are described in this section.

3.1.1 Technology assessment and refinement

Krishi Vigyan Kendras undertake assessment and refinement of technologies through On Farm Trials in participatory mode involving farmers, with an objective of developing and disseminating location specific technologies. During the period under report, a total of 301 technologies were assessed and 10 technologies refined by KVKs through 1973 On Farm Trials at 361 locations.

Technology Assessment and Refinement – a brief overview

- A total of 301 technologies were assessed and 10 technologies refined by KVKs through 1973 On Farm Trials at 361 locations.
- Of these, 88% of technologies were under crops and 11 % were under livestock, poultry and fisheries enterprises
- Under crops, more number of technologies were assessed in Varietal Evaluation (75), Integrated. Disease Management (39), Integrated Nutrient Management (33), Integrated Crop Management (26), Cropping Systems (25) followed by Integrated Pest Management (23)
- Among crops more number of interventions were conducted in paddy, pigeon pea, groundnut, banana, tomato, onion and turmeric
- Under animal husbandry, more number of technologies were assessed in Production and Management (13), followed by Disease management (10) and Nutrition Management (10)

3.1.1.1 Technology Assessment

During the year, the KVKs of the Zone have assessed 264 technologies through 1558 On Farm Trials on various crops under different thematic areas such as cropping system (25), integrated disease management (39), drudgery reduction (02), farm machinery (04), integrated crop management (26), integrated nutrient management (33), integrated pest and disease management (12), integrated pest management (23), processing and value addition (03), resource conservation technologies (17), seed/planting material production (02), storage technique (01), varietal evaluation (75) and weed management (02). Details on number of trials and number of locations under each thematic area are presented

Table 7 : Crops: thematic area-wise technologies assessed

Thematic areas	No. of technologies	No. of trials	No. of locations
Cropping system	25	156	25
Integrated Disease Management	39	215	45
Drudgery Reduction	02	18	04
Farm Machinery	04	25	04
Integrated Crop Management	26	126	29
Integrated Nutrient Management	33	158	34
Integrated Pest and Disease Management	12	80	12
Integrated Pest Management	23	101	21
Processing and Value Addition	03	11	03
Resource Conservation Technology	17	98	19
Seed/Planting Material Production	02	11	02
Storage Techniques	01	05	01
Varietal Evaluation	75	543	112
Weed Management	02	11	02
Total	**264**	**1558**	**313**

Table 8 shows that 96 technologies were assessed through 608 trials in Tamil Nadu, 92 technologies assessed through 512 trials in Karnataka, 69 technologies assessed through 403 trials in Kerala, 04 technologies assessed through 20 trials in Goa and 03 technologies assessed through 15 trials in Puducherry.

Table 8 : Crops: state-wise technology assessment under crops

State	No. of technologies	No. of trials	No. of locations
Karnataka	92	512	119
Kerala	69	403	75
Tamil Nadu	96	608	112
Goa	04	20	04
Puducherry	03	15	03
Total	**264**	**1558**	**313**

In the case of animal husbandry, poultry and fisheries, KVKs assessed 33 technologies on three thematic areas including disease management (10), nutrition management (10), and production and management (13) through 333 on farm trials and the details on number of trials and locations on each thematic area are presented in Table 9.

Table 9: Animal Husbandry, Poultry and Fisheries: thematic area wise technologies assessed

Thematic areas	No. of technologies	No. of trials	No. of locations
Disease Management	10	135	10
Nutrition Management	10	114	10
Production and Management	13	84	13
Total	33	333	33

Fifteen technologies were assessed through 193 trials in Tamil Nadu followed by 10 technologies assessed through in 82 trials in Karnataka, 07 technologies assessed through 53 trials in Kerala, and 01 technology assessed through 05 trials in Puducherry (Table 10).

Table 10: Animal Husbandry, Poultry and Fisheries : state-wise technology assessment

State	No. of technologies	No. of trials	No. of locations
Karnataka	10	82	10
Kerala	07	53	07
Tamil Nadu	15	193	15
Puducherry	01	05	01
Total	**33**	**333**	**33**

In the case of technologies assessed for empowerment of rural women, 04 technologies were assessed under the thematic area of production and management through 18 On Farm Trials by KVKs in Kerala.

Table 11 : Thematic area-wise technologies assessed for empowerment of rural women

State	Thematic area s	No. of technologies	No. of trials	No. of locations
Kerala	Production and Management	04	18	04
	Total	**04**	**18**	**04**

3.1.1.2 Refinement

During the year, KVKs refined 09 technologies through 37 On Farm Trials on various crops under different thematic areas such as cropping system (01), drudgery reduction for women (01), farm machineries (03), resource conservation technology (02) and seed/planting material production (02). Details on number of trials and number of locations under each thematic area are presented in Table 12.

Table 12 : Crops: thematic area-wise technologies refined

Thematic areas	No. of technologies	No. of trials	No. of locations
Cropping Systems	01	05	01
Drudgery Reduction for Women	01	05	01
Farm Machineries	03	07	04
Resource Conservation Technology	02	10	02
Seeds and Planting Material Production	02	10	02
Total	**09**	**37**	**10**

Under crops, five technologies were refined through 20 trials in Kerala followed by 2 technologies refined through 10 trials in Karnataka and 2 technologies refined through 07 trials in Tamil Nadu (Table 13).

Table 13 : Crops: state-wise technology refinement under crops

State	No. of technologies	No. of trials	No. of KVKs
Karnataka	02	10	02
Kerala	05	20	06
Tamil Nadu	02	07	02
Total	**09**	**37**	**10**

In the case of technologies for empowerment of rural women, 01 technology was refined under the thematic area of Production and Management through 27 On Farm Trials by KVKs in Karnataka.

Table 14 : Thematic area-wise technologies refined for empowerment of rural women

State	Thematic areas	No. of technologies	No. of trials	No. of locations
Karnataka	Production and Management	01	27	01
	Total	**01**	**27**	**01**

3.1.1.3 Location specificity of the technologies

(A) Varietal Evaluation

Assessment of chickpea varieties in Northern Karnataka

Chickpea (Bengalgram) is a major pulse crop widely cultivated during rabi season mostly under rainfed condition in Northern Karnataka. It is cultivated in an area of 8 lakh ha with an annual production of 3.9 lakh t. The average yield of the crop is 518 kg/ha. Improvement of yield in chickpea is the major aim of farmers, agricultural research and extension personnel of the region. For this three high yielding varieties of chickpea viz., Annigeri - 1, JG-11 and JG-14 were assessed for their performance in Belgaum, Bellary and Bidar districts. The results indicated that JG-14 out yielded the other two varieties in all the three districts. The respective yield in Belgaum , Bellary and Bidar was 8.8 q/ha, 15.5 q/ha and 15.0 q/ha as against the respective yield of JG-11 viz., 7.7 q/ha, 14.1 q/ha and 12.5 q/ha. Net return in case of JG-14 was Rs.18830/ha, Rs.26800/ha and Rs.25750/ha in the three districts and the BCR was 4.3, 2.6 and 2.3 respectively.

On farm trial in chickpea in Bidar district with JG-14 variety

Assessment of groundnut varieties under rainfed conditions

Groundnut is an important oilseed crop cultivated in most of the districts of Karnataka. It is cultivated in an area of 6.8 lakh ha with an annual production of 4.7 lakh t with an average productivity of 690 kg/ha. Haveri and Gadag are the two major drought-prone districts of Northern Karnataka, where the yield level often is low due to extreme moisture stress. In the research station, cv.Kadiri 6 performed better under moisture stress conditions. Based on this, an assessment was conducted on the performance of cv.Kadiri under rainfed conditions along with cv. TMV 2 and GPBD 4. Results indicated that cv. Kadiri 6 gave better yield (17.0 q/ha and 16.7 q/ha) at Haveri and Gadag districts respectively. The realized net return was Rs.16780/ha and

Rs.23480/ha. Net return was higher in Gadag due to lower cost of cultivation and hence the BCR was higher (1.7) as compared to Haveri (1.5).

Assessment of Kadari-6 variety in groundnut for drought tolerance

Assessment of onion varieties in Karnataka

Onion is cultivated in an area of 1.5 lakh ha in Karnataka and the annual production is about 7.8 lakh t. The average productivity is 5100 kg/ha. Four KVKs located in Koppal, Bellary, Dharwad and Haveri districts assessed high yielding varieties of onion viz., Arka Kalyan and Bhima Super along with local variety Bellary Red. In the case of Bellary district, cv. Fursangi was assessed instead of Bhima Super. Bhima Super gave higher yield at Koppal (320 q/ha) and Dharwad (380 q/ha), whereas Arka Kalyan gave higher yield in Bellary (243 q/ha) and Haveri (210 q/ha). Net return was ranging between Rs.1.2 lakh/ha to Rs.1.8 lakh/ha and the BCR was 4.6 at Koppal, 9.5 in Dharwad and 8.4 in Haveri. Higher BCR at Dharwad and Haveri was due to better moisture during the critical stages of crop growth, lower cost of cultivation and better price that prevailed during harvesting season.

Assessment of cowpea varieties in Kerala

Cowpea is an important vegetable widely cultivated under homestead farming systems of Kerala. KVK Calicut conducted comparative assessment of two high yielding varieties viz., Bhagyalaxmi and Kashi Kanchan and the results indicated that cv. Bhagyalaxmi gave higher yield (125 q/ha) as compared to Kashi Kanchan

Onion plot field visit by KVK scientists at Haveri district

(98.9 q/ha). However, the latter fetched higher market price and hence realized higher net return (Rs.75340/ha) and BCR (2.7) as compared to cv.Bhagyalaxmi, which realized a net return of Rs.61850/ha with a BCR of 2.6. In Thrissur district, among the four high yielding varieties Lola, Vellayani Jyothika, YB7 and NS 621; the highest net return and BCR were realized for Lola (150 q/ha; Rs.270000/ha and 1.8 respectively), followed by NS 621 (148 q/ha; Rs..262600 /ha and 1.8).

On farm trial in high yileding cow pea varieties in Calicut district

Assessment of tapioca varieties in Tamil Nadu

Tapioca is a major tuber crop cultivated in an area of 1.2 lakh ha with an annual production of 41.0 lakh t and the average productivity of 34170 kg/ha. In order to improve the productivity of tapioca, KVK Namakkal assessed high yielding varieties *viz.*, Muluvadi, Sree Athulya and

Yethapur-1. Sree Athulya recorded the highest yield (369.8 q/ha) in Namakkal. Respective net return was Rs.63550/ha and BCR was 142.3.

On farm trial in high yielding tapioca variety - Namakkal district

(B) Crop Production and Management

Planting systems in banana for higher productivity

Banana is a major fruit crop in Karnataka, cultivated in 0.9 lakh ha with an annual production of 23.5 lakh t with a productivity of 25.6 tonnes/ha, which is 50% of its neighbouring states like Maharashtra and Tamil Nadu. In order to improve the productivity, Krishi Vigyan Kendras located at Kodagu and Koppal in Karnataka conducted on farm testing on planting methods / systems. The results indicated that paired row of planting with a spacing of 1.2 x 1.2 m X 2 m gave 135 t/ha and 50 t/ha in Koppal and Kodagu districts respectively. In Koppal the net return was Rs.1029000/ha and BCR was 8.2. The same in the case of Kodagu was Rs.308000/ha and 3.8 respectively.

On farm trial in paired row planting systems of banana - Kodagu district

The results confirmed that planting systems in banana are highly profitable in both the districts and in the case of Koppal; the comparative profitability was significantly higher, which is revealed through higher productivity and Benefit Cost Ratio.

On farm trial in paired row planting of banana - Koppal district

Drought management in blackgram in Tamil Nadu

Blackgram is a major pulse crop widely cultivated in Tamil Nadu. It is cultivated in an area of 3.6 lakh ha with an annual production of 1.9 lakh t with an average productivity of 521 kg/ha. In order to realize higher productivity especially during drought situations, application of Methylo bacterium is being recommended by TNAU Coimbatore. KVKs Theni and Tuticorin assessed this technology and the results were encouraging. Yield in Theni was 7.8 q/ha, while it was 7.2 q/ha in Tuticorin. Respective net return was Rs.17000/ha and Rs.22100/ha. The net return was higher at Tuticorin due to lower cost of cultivation. BCR was 1.7 at Theni and 2.6 at Tuticorin.

Drought management in blackgram with PPFM - Tuticorin district

3.1.2 Frontline demonstrations

As a major mandated activity of KVK, frontline demonstrations (FLDs) of crops and allied agriculture technologies were conducted to show the production potential of newly released cvs., production technologies in crops, animal husbandry and other related enterprises. During the year, 9131 frontline demonstrations were conducted (Table 15). These included 1075 on cereals, 594 on millets, 615 on oilseeds, 533 on pulses, 255 on commercial crops, 98 on fodder crops, 24 on green manure crops, 983 on vegetable crops, 110 on tuber crops, 574 on fruit crops, 123 on flowers, 227 on spice crops, 282 on plantation crops and 25 on medicinal crops. Besides, 1344 demonstrations on hybrids of various crops, 582 on farm implements, 610 on livestock and fisheries 568 demonstrations on enterprises in the states of Karnataka, Tamil Nadu, Kerala, Goa, Pondicherry and UT of Lakshadweep and 509 demonstrations on pulses. in the NFSM implementing districts of Karnataka and Tamil Nadu as special programme to enhance the pulses production were conducted covering an area of 3576.77 ha. Apart from this, 1826 demonstrations in the KVKs of Karnataka (733), Tamil Nadu (406), Kerala (523), Goa (54), and Pondicherry (110) are at different stages of implementation at the time of compilation of the report (Table 15).

Table 15: Details of frontline demonstrations implemented during 2013-14

Crop Category	No. of farmers	Area (ha)
Cereals	1075	431.1
Millets	594	248.2
Oilseeds	615	223.5
Pulses	533	173.8
Commercial crops	255	99.4
Fodder Crops	98	48.1
Green manure crops	24	10.0
Vegetable crops	983	238.4
Tuber crops	110	30.3
Fruit crops	574	164.9
Flowers	123	36.7
Plantation crops	282	86.1
Spices	227	47.6
Medicinal crops	25	10.0
Total	**5518**	**1848.1**
Special pulses programme in NFSM districts	509	211.6
Hybrids	1344	472.9
Farm implements	582	1044.0
Livestock, fisheries, sheep & goat, piggery	610	
Other enterprises	568	
Grand total	**9131**	**3576.8**
Demonstrations under progress in crops	1826	583.6

The state-wise and crop-wise results recorded under FLDs in different farming situations during 2013-14 are discussed as under:

3.1.2.1 Karnataka

A total of 2380 demonstrations were conducted in various crops covering an area of 912.3 ha during the year by the 31 KVKs of Karnataka State. The results are presented in Table 16.

Cereals: A total of 441 demonstrations in cereals such as paddy, wheat and maize were conducted covering an area of 164.3 ha in the farmers' fields during the year (Table 16). The technologies such as ICM, IPM, IPDM, variety introduction, farm mechanization, weed management, problematic soil management and aerobic paddy as water saving technologies resulted in the increased yield of paddy ranging from 8.3% in problematic soil management to 31.7% in IDM as compared to farmers' practice. The BCR was higher in all the technology demonstrations as compared to farmers' practice. In wheat, demonstration of ICM and new variety UAS-304 resulted in higher yield of 26.6 % and 20.4% respectively as compared to farmers' practice. Similarly in maize, INM and ICM technologies have out yielded the framers practice by recording an increase of 19.3% and 32.2% respectively over farmers' practice (Table 16).

Table 16: Effect of thematic area-wise FLDs on the yield and economic returns in cereal crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Karnataka								
Paddy	Farm mechanization	30	14.5	56.7	51.5	12.0	2.3	2.0
	IDM	70	16.0	49.0	37.4	31.7	2.0	1.6
	INM	10	10.0	71.2	61.9	15.1	2.7	2.0
	IPM	33	14.0	63.0	53.1	19.3	3.1	2.7
	Integrated weed management	10	4.0	59.0	52.3	12.8	2.6	2.3
	Problematic soil management	12	5.0	54.8	50.6	8.3	2.6	2.4
	Variety introduction (JGL 1798)	30	8.0	51.0	46.9	10.5	2.1	1.7
	Aerobic paddy cultivation	10	2.0	37.3	33.1	12.7	2.0	1.4
	ICM	134	49.0	57.3	49.5	15.8	2.9	2.4
		339	**122.5**					
Wheat	ICM	49	20.0	27.2	22.5	20.4	3.3	2.8
	Variety introduction (UAS-304)	19	8.0	29.5	23.3	26.6	2.8	2.3
		68	**28.0**					
Maize	INM	12	5.0	21.4	19.3	10.9	4.4	3.7
	ICM	22	8.8	41.4	32.2	29.23	2.8	2.0
		34	13.8					
		441	**164.3**					

Drum seeder method of sowing in paddy in Mandya

Millets: A total of 433 demonstrations were conducted on millets such as finger millet, foxtail millet, little millet and sorghum covering an area of 185.2 ha of farmers' fields (Table 17). In finger millet, demonstration of dry farming technology recorded about 30% higher yield followed by introduction of KMR 301 variety and ICM technologies. The BCR was also very encouraging with technology demonstrations as compared to farmers' practice. In foxtail millet, ICM, INM and SIA-2644 variety introduction recorded higher yield as compared to farmers' practice with higher BCR. The introduction of Cv. Sukshema of little millet also recorded higher yield of 13.2 q/ha as compared to 10.5 q/ha in farmers' practice. Demonstrations of Improved technologies in sorghum also resulted in higher yield increase to the extent of 13.3% due to Cv. CSV 22 to 400% on account of relay cropping with onion (Table 17)

Table 17: Effect of thematic area-wise FLDs on the yield and economic returns in millet crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Finger millet	Dry land farming	10	5.0	24.3	18.7	30	1.7	1.1
	ICM	106	44.0	27.5	23.0	21.2	2.6	2.3
	Variety introduction (KMR 301)	20	8.0	34.2	26.5	28.7	3.2	2.7
		136	**57.0**					
Foxtail millet	ICM	52	21.0	13.9	9.8	17.0	3.6	3.3
	INM	10	4.0	2.6	2.5	4.4	1.3	3.2
	Variety introduction (SIA- 2644)	108	49.2	12.4	9.4	31.6	2.6	1.9
	Crop diversification	10	4.0	5.5			1.8	
		180	**78.2**					
Little millet	Variety introduction (Sukshema)	25	10.0	13.2	10.5	25.7	2.9	2.5
Sorghum	Relay cropping (Sorghum+onion)	15	6.0	57.0	11.4	400.0	2.7	1.9
	ICM	59	24.0	19.2	15.5	23.0	3.7	3.1
Sorghum (Rabi)	Variety introduction (CSV 22)	18	10.0	13.8	12.2	13.3	1.5	1.4
		433	**185.2**					

Demonstration on foxtail millet at Chamarajanagar

Oilseeds: During the year, 280 demonstrations were laid out on farmers' fields by 31 KVKs of Karnataka covering castor, groundnut, safflower, sesame and soybean in an area of 115.6 ha (Table 18). In castor, the yield recorded with ICM was 20.9 q/ha as against 17.5 q/ha in farmers' practice. The BCR was 3.8 in the case of demonstration and 3.3 under farmers' practice. Groundnut performed better under technology demonstrations such as ICM, INM and introduction of cvs. GPBD and KCG-2 with BCR ranging from 2.6 to 3.5 as against farmers' practice which ranged from 1.4 to 3.2. Demonstrations of ICM, IPM and soil management in sunflower out yielded the farmers' practice with 11.3 to 85% increase in yield. ICM demonstration in sesame also recorded a higher yield of 4.5 q/ha as against 3.8 q/ha in farmers' practice. ICM, IPDM and cv DBS-21 in soybean recorded yield increase to the extent of 20.6 to 23.8% as compared to farmers' practice (Table 18).

Table 18: Effect of thematic area-wise FLDs on the yield and economic returns in oilseed crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Castor	ICM	10	4.0	20.9	17.5	19.3	3.8	3.3
Groundnut	Crop Management	5	2.0	11.2	9.5	18.2	3.5	3.2
	ICM	37	18.2	11.6	9.3	26.4	2.6	2.1
	INM	37	15.8	21.9	17.2	24.7	3.1	2.7
	Variety introduction (GPBD-5, KCG-2)	25	8.0	17.4	12.0	21.4	2.6	1.4
		104	**44.0**					
Safflower	ICM	35	14.0	12.7	11.5	11.3	4.1	3.7
	IPM	10	4.0	8.2	6.7	22.5	5.5	4.8
	Soil Management	10	5.0	5.9	3.2	85.0	1.8	1.3
		55	23.0					
Sesamum	ICM	24	10.0	4.5	3.8	31.8	3.1	2.6
Soybean	ICM	34	14.0	20.9	17.2	20.6	4.1	3.6
	IPDM	37	15.0	18.6	15.0	22.4	3.3	2.6
	Variety introduction (DBS-21)	16	5.6	21.9	17.8	23.8	4.2	3.7
		111	**44.6**					
		280	**115.6**					

ICM in soybean at Belgaum

Pulses: A total of 206 demonstrations were laid out in major pulses such as blackgram, pigeonpea, fieldbean and chickpea on 83.6 ha of farmers' field during 2013-14 by the KVKs of Karnataka state (Table 19). Blackgram recorded 7.1 q/ha with ICM as against 5.6 q/ha under farmer's practice. Fieldbean cv. HA-4 resulted in almost double the yield (16.34 q/ha) compared to that under farmers' practice (8.48 q/ha). In pigeonpea, demonstrations of ICM, IPDM, cv. BRG-2 (for green pod) and transplanting technique recorded increased yield ranging from 19.4% (ICM) to 41.2% (transplanting technique) as compared to farmers' practice. During rabi season, 100 demonstrations conducted in chickpea by the KVKs of Karnataka state have revealed encouraging results in all the improved technologies with higher BCR as compared to farmer's practice (Table 19).

Table 19: Effect of thematic area-wise FLDs on the yield and economic returns in pulse crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Blackgram	ICM	16	5.0	7.1	5.6	26.8	2.2	2.4
Fieldbean	Variety introduction (HA 4)	23	9.2	16.3	8.5	100.6	2.3	0.7
Pigeonpea	ICM	46	21.0	12.8	10.8	19.4	3.9	3.4
	IPDM	5	2.0	8.8	6.3	39.7	2.5	1.7
	Transplanting technique	6	2.2	5.5	3.9	41.2	1.3	1.2
	Variety introduction Green pod(BRG 2)	10	4.0	42.3	33.9	25.0	1.9	1.6
		67	**29.2**					
Chickpea	ICM	70	28.0	15.0	12.3	21.1	4.0	3.2
	INM	5	2.0	7.5	5.3	42.9	2.1	1.8
	IPM	13	5.2	11.3	9.3	21.6	1.8	1.3
	Variety introduction (BGD 103)	12	5.0	8.1	6.8	20.0	2.1	1.7
		100	**40.2**					
		206						

ICM in chickpea at Gulbarga

Commercial crops: A total of 151 demonstrations were conducted in major commercial crops of Karnataka state such as dry chilli, cotton, sugarcane and mulberry covering an area of 60.4 ha during the year (Table 20). Demonstration of ICM for dry chilli production resulted in an increase of 11.3% as against farmers' practice. In cotton, ICM demonstration reordered seed cotton yield of 21.2 q/ha as compared to 18.0 q/ha in farmers' practice. In mulberry, demonstrations of INM, IPM and new varieties gave higher yield of green leaf as compared to farmers' practice (Table 20). Similarly, demonstration of ICM, IPM and micro nutrient management in sugarcane resulted in an increased tonnage (29.3% to 35.0%).

Table 20: Effect of thematic area-wise FLDs on the yield and economic returns in commercial crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase	B:C ratio	
				Demo	Check	over check	Demo	Check
Chilli dry	ICM	30	11.0	15.8	14.1	11.3	4.6	4.1
Cotton	ICM	31	12.0	21.2	18.0	19.4	4.5	4.0
	Varietal introduction (DDHC-11)	10	4.0	3.00	2.5	20.0	2.3	2.1
		71	**27.0**					
Mulberry (leaf yield)	INM	11	4.4	221.2	167.5	27.8	3.1	1.9
	IPM	25	7.0	545.7	500.4	9.1	3.0	2.3
	Variety introduction (Vishala & Suvarna)	2	0.2	617.5	590.0	4.7	1.3	1.2
		38	**11.6**					
Sugarcane	ICM	26	9.8	1219.0	896.0	35.0	5.7	3.8
	IPM	11	10.0	1455.0	1125.0	29.3	2.3	1.7
	Nursery raising, zinc and iron management	5	2.0	1596.0	1348.0	18.4	4.6	3.2
		43	**21.8**					
		151	**60.4**					

INM in mulberry at Mandya

Fodder crops: During the year 15 demonstrations were laid out on production of mixed fodder crops on an area of 4 ha (Table 21). The results indicated that the green fodder yield was higher with 391.8 q/ha under mixed fodder production as compared to 274 q/ha as mono crop (farmers' practice).

Table 21: Effect of mixed fodder crop FLDs on fodder yield

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha) Demo	Check	% increase over check
Mixed fodder crops	Fodder Crops (South African Tall - Maize, COFS29- Sorghum, CO4, KBC-2 Cowpea, Lucerne)	15	4.0	391.8	274.0	39.1

Green manure crops: Demonstrations on green manure crops such as mucuna and Arka Dhanvantri for seed recorded higher green manure yield in mucuna with 8300 q/ha as compared to farmers' practice. In case of Arka Dhanvantri, seed production as an inter crop in coconut garden gave higher BCR of 5.7 (Table 22).

Table 22: Performance of green manure crops under FLDs'

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Arka Dhanvantri	Arka Dhanvantri as inter crop in coconut for seed	12	5.0	2.9	-	-	5.7	-
Mucuna	ICM for green biomass	12	5.0	8300.0	7500.0	10.7	2.8	2.7
		24	**10.0**					

Vegetable crops: A total of 291 demonstrations were taken up on various vegetables comprising amaranthus, ashgourd, ridgegourd, tomato, bhendi, brinjal, onion, cauliflower, chilli, coccinia, green pea, drumstick, and pole bean on 110 ha (Table 23). Among the vegetables demonstrated, the highest increase in yield was recorded in amaranthus with 223.3 q/ha as compared to 108.7 q/ha under farmers' practices. The yield increased due to technology demonstration in ashgourd, bhendi cauliflower, coccinia, french bean, green peas, pole beans, ridgegourd and tomato was in the order of 19.8, 36.4, 6.8, 20.9, 19.6, 17.4, 31.8, 16 and 15.0%

respectively over farmers' practice for respective crops (Table 23). The yield recorded in brinjal under demonstration of IDM and IPM showed significant increase of 15.4% and 58.5% respectively over farmers' practices. In drumstick, ICM demonstration and introduction of cv. Bhagya recorded higher yield with better BCR (5.79) under demonstrations. Similarly, in onion, ICM, IDM, INM and IPM demonstrations recorded a yield increase of 22.3 to 27.8 % over farmers' practice. BCR was also higher with technology demonstration as compared to farmers' practice in all the vegetables production technologies demonstrated (Table 23).

Table 23: Effect of thematic area-wise FLDs on the yield and economic returns in vegetable crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Amaranthus	ICM	30	4.0	223.3	108.7	105.5	2.3	1.8
Ashgourd	INM	10	2.0	163.0	136.0	19.9	2.5	2.0
Bhendi	DM	21	6.0	53.4	40.8	36.4	6.4	5.4
Brinjal	IDM	8	3.0	135.9	117.8	15.4	2.2	2.1
	IPM	10	5.0	283.6	178.9	58.5	4.3	2.9
		18	**8.0**					
Cauliflower	INM	10	4.0	542.6	508.2	6.8	2.8	2.8
Chilli green	IDM	10	4.0	32.5	26.5	22.6	3.8	2.8
	IPM	7	6.0	78.7	67.2	14.7	3.5	2.9
		17	**10.0**					
Coccinia	ICM	15	3.0	520.0	430.0	20.9	2.1	1.7
Drumstick	ICM	12	5.0	20.0	16.6	20.4	1.9	1.7
	Variety introduction – No of fruits (Bhagya)	10	4.0	90482	54586	65.8	5.8	2.0
		22	**9.0**					
French bean	Variety introduction Arka Sharath)	15	4.0	124.5	99.1	19.6	2.9	2.3
Green peas	ICM	5	2.0	87.5	74.5	17.5	4.4	3.3
Onion	ICM	49	20.0	200.4	158.1	26.9	5.0	3.9
	IDM	10	5.0	230.0	180.0	27.8	11.8	9.6
	INM	12	5.0	287.5	225.9	27.3	7.7	4.7
	IPM	4	10.0	147.5	120.0	22.9	5.7	4.4
		75	**40.0**					
Pole beans	IDM	18	5.0	138.9	106.5	31.8	2.8	2.2
Ridgegourd	INM	10	4.0	58.0	50.0	16.0	2.1	1.6
Tomato	ICM	25	9.0	154.3	131.6	15.0	4.1	3.3
		291	**110.0**					

Polythene mulch in tomato at Tumkur

Tuber crops: In potato, 18 demonstrations were conducted on INM and IPM technologies covering an area of 7.1 ha by KVKs of Karnataka during rabi 2013-14 (Table 24). The results indicated that ICM and IPM technologies gave higher yield over local check by 19.6% and 13.4 % respectively.

Fruit crops: A total of 257 demonstrations were taken up on various fruit crops like banana, citrus, coorg mandarin, grape, lime, mango, pomegranate and sapota on about 85 ha (Table25). In banana, the major fruit crop of the State, 134 demonstrations were conducted on ICM, IDM, IPM, INM and micro nutrient management. The results indicated that the yield was substantially higher with increase ranging from 13.4% to 44.7% with better BCR as compared to farmers' practice (Table 25). In mango, 17 demonstrations conducted on IPDM and nutrient management revealed an increase of 24.3% and 27.6% respectively over farmers' practice. The yield increase recorded as compared to farmers' practice was 62.2% in citrus, 24.0% in coorg mandarin, 12.8 % in grapes, 12.1% in lime, 13.4 % in pomegranate and 28.1% in sapota there by recording higher BCR of 5.8, 1.7, 4.2, 2.2, 5.1, and 3.8 respectively as compared to local checks (Table 25).

Table 24: Effect of thematic area-wise FLDs on the yield and economic returns in tuber crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Potato	INM	8	3.2	105.0	87.8	19.6	3.8	3.4
	IPM	10	3.9	112.0	98.8	13.4	2.7	2.4
		18	**7.1**					

Table 25: Effect of thematic area-wise FLDs on the yield and economic returns in fruit crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Banana	ICM (Robusta)	15	7.0	383.7	339.4	13.4	3.0	3.9
	ICM (Yelaki type)	12	4.0	204.4	154.1	32.6	4.0	2.6
	IDM	15	6.0	267.3	217.0	23.1	2.9	2.3
	INM (Yelaki)	32	13.5	377.0	261.9	44.7	3.4	2.5
	INM (Robusta)	40	8.0	445.5	357.9	32.4	3.4	2.3
	Micronutrient management	20	8.0	283.8	247.0	14.7	2.3	1.7
		134	**46.5**					

Table 25 (Continued...)

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha) Demo	Yield (q/ha) Check	% increase over check	B:C ratio Demo	B:C ratio Check
Citrus	ICM	12	5.0	180.0	111.0	62.2	5.8	4.8
Coorg Mandarin	ICM	20	2.0	135.5	109.2	24.1	1.7	1.2
Grapes	IPM	37	14.0	111.5	102.6	12.8	4.2	3.5
Lime	IPDM	10	4.0	130.0	116.0	12.1	2.2	2.1
Mango	IPDM	5	2.0	84.5	68.0	24.3	3.9	2.7
	Nutrient management	12	5.0	162.0	127.0	27.6	5.5	4.2
		17	**7.0**					
Pomegranate	IPDM	10	4.0	72.1	63.6	13.4	5.1	3.6
Sapota	IPM	17	2.4	10.3	8.0	28.1	3.8	3.2
		257	**84.9**					

High density planting in banana at Tumkur

Flower and medicinal crops: During the year, 48 demonstrations on flower crops like aster, gaillardia, jasmine, and marigold were conducted in 14.3 ha (Table 26). The yield increase recorded under FLDs as compared to farmers' practice was 20.8 % in China aster, 14.3% in gaillardia, 26.6% in jasmine and 21.0% in marigold with BCR ranging from 2.3 to 5.3 (Table 26). Adoption of improved variety with improved crop management practices in flower crops emerged as frontline technologies for up scaling flower production. In medicinal crops, introduction of ashwagandha as alternative crop in irrigated gardens of 25 farmers' fields performed well with higher BCR (Table 26).

Table 26: Effect of thematic area-wise FLDs on the yield and economic returns in flower crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha) Demo	Yield (q/ha) Check	%increase over check	B:C ratio Demo	B:C ratio Check
China Aster	ICM	15	6.0	38.0	31.5	20.8	3.8	3.1
Gaillardia	ICM	15	5.0	101.2	88.6	14.3	5.3	4.2
	Varietal introduction (Arabhavi Local)	4	2.0	125.0	112.5	11.1	3.5	2.9
		19	**7.0**					
Jasmine	ICM	10	0.5	72.3	57.1	26.6	2.6	2.4
Marigold	ICM	4	0.8	127.0	105.0	21.0	2.3	1.8
		48	**14.3**					
Ashwagandha	Crop diversification	25	10.0	5.8			2.7	

Spice crops: A total of 106 demonstrations were conducted in black pepper and ginger covering 29.4 ha during the year (Table 27). The yield increase recorded as compared to farmers' practice was 27.4 % in black pepper due to IDM demonstration and the yield increase in ginger ranged from 12.3% due to ICM demonstration to 57.4% due to IDM leading to higher BCR (Table27).

Table 27: Effect of thematic area-wise FLDs on the yield and economic returns in spice crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Blackpepper	IDM	50	9.8	19.1	15.9	27.4	5.6	4.4
Ginger	ICM	8	3	206.1	155.0	33.0	3.2	2.3
	IDM	10	2	115.7	73.5	57.4	3.8	2.5
	Micronutrient management	10	4	212.4	189.1	12.3	11.3	9.0
	Pest management	28	10.6	287.7	258.5	12.5	3.8	3.6
		106	**29.4**					

Plantation crops: A total of 85 demonstrations were taken up on arecanut, betel vine, cashew and coconut in 33.5 ha area by the KVKs of Karnataka state (Table 28). The yield increase recorded in demonstrations as compared to farmers' practice was 37.3% due to ICM, 23.7% due to pest management and 13.5% due to INM in arecanut, 33.8% due to ICM in cashewnut, 13.6% due to IDM in betel vine and 8.7% due to ICM, 29.3% due to IDM and 43.8% due to IPM in coconut (Table 28).

Table 28: Effect of thematic area-wise FLDs on the yield and economic returns in plantation crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Arecanut	ICM	10	4.0	29.8	21.7	37.3	7.2	7.0
	Pest management	28	14.0	9.6	7.8	23.7	3.1	2.9
	INM	12	2.0	10.9	9.6	13.5	4.8	4.4
		50	**20.0**					
Betel vine (No/ha)	IDM	5	2.0	26540	23360	13.6	3.7	3.1
Cashew	ICM	10	4.0	9.5	7.1	33.8	3.6	3.0
Coconut (Nuts/ha)	ICM	10	4.0	9920	9120	8.8	2.6	2.5
	IDM	5	2.5	7280	5630	29.3	1.9	1.6
	IPM	5	1.0	7360	5120	43.8	1.4	1.2
		20	**7.5**					
		85	**33.5**					

Demonstration on lime application in arecanut at Uttar Kannada

3.1.2.2 Tamil Nadu

A total of 2068 demonstrations were conducted in various crops covering an area of 754.26 ha during the year by 30 KVKs of Tamil Nadu State. Details are presented in the following paragraph.

Cereals: A total of 476 demonstrations were conducted in cereals such as paddy, wheat and maize covering an area of 215.4 ha in the farmers' fields during the year (Table 29). Technology packages such as IDM, ICM, drought management, IPDM, SRI technique, salt tolerant variety, management of problematic soils, improved variety and farm mechanization were demonstrated in paddy. The result clearly showed the superiority of these technology packages over their local checks/farmers' practices by recording substantial increase in yield (Table 29). Demonstration on maize under cropping systems recorded 68.2 q/ha as against 64 q/ha in farmers' practice. Demonstration of wheat as alternate crop in the foothills of Tamil Nadu showed its economic viability by recording 29.8 q/ha and BCR of 2.5 (Table 29).

Table 29: Effect of thematic area-wise FLDs on the yield and economic returns in cereal crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Paddy	IDM	77	37.4	44.5	39.2	15.1	2.1	1.9
	Variety introduction (Co-50)	107	50.0	52.2	44.2	19.1	2.5	2.1
	Seed Production	10	2.0	50.9	51.3	-0.7	3.1	2.2
	Drought management	40	28.0	24.8	17.2	89.8	1.7	1.0
	Farm Mechanisation	40	15.0	66.0	56.0	18.7	3.6	2.5
	ICM	130	55.0	59.0	48.9	22.1	2.5	2.0
	IPDM	10	4.0	71.5	58.7	21.8	1.8	1.5
	Problematic soil management	25	10.0	38.9	30.7	24.3	1.4	1.3
	Saline tolerant variety TRY3	10	2.0	62.5	47.8	30.6	3.0	2.6
	SRI in paddy	10	5.0	60.5	47.0	28.7	2.1	1.8
		459	**208.4**					
Maize	Cropping systems	7	3.0	68.2	64.0	6.6	2.5	2.3
Wheat	Crop diversification	10	4.0	29.8	23.6	26.3	2.5	2.3
		476	**215.4**					

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Millets: A total of 151 demonstrations were conducted in millets such as bajra, finger millet, barnyard millet, kodo millet, proso millet and sorghum crops covering an area of 63 ha of farmers' fields (Table 30). Technology packages such as ICM, IPDM and introduction of Co(Cu)9 variety of bajra clearly demonstrated their superiority in farmers' field by recording increased yield to the extent of 24%, 40% and 21.6% respectively over their local checks/practices (Table 30). In finger millet, ICM and problematic soil management have shown their superiority by registering an increase of 23% and 33% respectively over their local checks. Similarly, demonstrations recorded higher yield in minor millets such as barnyard millet, kodo millet and proso millet. Improved technology packages such as ICM, IPDM and crop variety Co-30 in sorghum also resulted in increased yield to the extent of 21.6% due to ICM, 71.4% due to IPDM and 6.8 % due to improved variety with higher BCR (Table 30).

Table 30: Effect of thematic area-wise FLDs on the yield and economic returns in millet crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Bajra	ICM	10	4.0	18.6	15.0	24.0	1.6	1.4
	IPDM	10	4.0	31.5	22.5	40.0	2.3	2.3
	Varietal introduction(Co (cu) 9)	3	2.0	11.8	9.7	21.6	2.0	1.8
		23	**10.0**					
Barnyard millet	ICM	10	4.0	21.0	12.5	68.0	2.9	1.9
Finger millet	ICM	12	1.0	22.8	18.5	23.0	1.8	1.5
	Problematic soil management	10	4.0	18.0	13.5	33.3	1.5	1.2
		22	**5.0**					
Kodo millet	Crop diversification	30	12.0	14.0	12.0	16.7	2.4	2.1
Proso millet	ICM	10	4.0	17.4	13.1	32.8	2.2	1.9
Sorghum	ICM	25	16.0	21.1	17.4	21.6	2.7	2.6
	IPDM	15	6.0	32.3	18.8	71.4	2.5	1.7
	Variety introduction (Co-30)	16	6.0	21.9	20.9	7.0	2.8	2.3
		56	**28.0**					
		151	**63.0**					

Demonstration on ragi Paiyur-2 with ICM at Salem

Oilseed crops: Major oilseeds of Tamil Nadu state such as groundnut and sesame were demonstrated in 241 farmers' fields covering an area of 97 ha (Table 31). Technologies such as farm mechanization, ICM, INM and cv. VRI-7 in groundnut have all recorded over 20% increase in pod yield as compared to their local checks/practices. In sesame, demonstration of ICM, INM and introduction of cv. TMV-4 showed superior performance with better yields and higher BCR as compared to farmers' practice (Table 31).

Table 31: Effect of thematic area-wise FLDs on the yield and economic returns in oilseed crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase	B:C ratio	
				Demo	Check	over check	Demo	Check
Groundnut	Farm mechanisation	20	9.0	26.1	22.0	20.1	3.1	2.5
	ICM	92	27.0	19.2	14.9	29.4	2.2	1.8
	INM	10	10.0	9.9	7.7	28.6	1.7	1.4
	Variety introduction (VRI 7)	20	4.0	22.6	18.6	21.5	2.6	2.4
		142	**50.0**					
Sesamum	ICM	77	32.0	6.7	4.7	42.8	3.3	2.6
	Varietal introduction (TMV 4)	12	5.0	7.3	5.0	45.8	2.9	2.0
	INM	10	10.0	6.5	5.2	24.2	2.8	2.5
		73	**37.0**					
		241	**97.0**					

ICM in groundnut at Ariyalur

Pulse crops: During rabi season a total of 298 demonstrations in major pulses of Tamil Nadu such as blackgram, greengram, pigeonpea, fieldbean, horsegram and chickpea were conducted in 84 ha area during 2013-14 (Table 32). Blackgram recorded 8.6 q/ha with ICM demonstration and 6.0 q/ha with improved variety VBN(bg)-7 as gainist 7.6 q/ha and 4.8 q/ha, respectively against their local checks. In greengram, Co (Gg)-8 variety demonstration resulted in highest yield of 9.5 q/ha followed by 5.6 q/ha in ICM as compared 8.1 q/ha and 3.8 q/ha in their respective local checks. In pigeonpea, ICM and IPM demonstrations in farmers' fields recorded higher yield to the extent of 53.2% in ICM to 17.8% in IPM as compared to farmers' practice. In chickpea, ICM demonstration resulted in an increased yield by 16.2 % with higher BCR of 2.0 as compared to farmers' practice (Table 32).

Table 32: Effect of thematic area-wise FLDs on the yield and economic returns in pulse crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Blackgram	ICM	181	46.0	8.6	7.6	14.1	2.5	2.0
	Varietal introduction (VBN(bg)7)	15	6.0	5.9	4.8	24.6	2.5	2.0
		196	**52.0**					
Chickpea	ICM	10	4.0	10.7	9.2	16.2	2.0	1.4
Greengram	ICM	10	4.0	5.6	3.8	48.3	2.0	1.4
	Variety introduction (Co (Gg) 8)	20	4.0	9.5	8.1	16.7	1.8	1.3
		30	**8.0**					
Horsegram	ICM	10	4.0	8.4	6.3	33.6	3.7	2.4
Pigeonpea	ICM	40	11.0	11.9	7.9	53.2	2.5	2.0
	IPM	12	5.0	13.9	11.8	17.8	2.1	1.8
		62	**16.0**					
		298	**84.0**					

Demonstration on blackgram with zero tillage at Vellore

Commercial crops: Improved technologies in major commercial crops like cotton, sugarcane and mulberry were demonstrated in 100 farmers' fields during the year by KVKs of Tamil Nadu covering an area of 37 ha (Table 33). In cotton, ICM and problematic soil management resulted in higher seed cotton yield of 14.8 q/ha and 18.6 q/ha respectively as compared to their checks, 11.9 and 18.5 q/ha respectively. Similarly in sugarcane, ICM, IPM and SSI technologies demonstrated their superiority over local checks by registering over 20% increase in cane yield. Demonstration of IPM in mulberry also recorded higher yield with higher BCR as compared to local practice (Table 33).

Table 33: Effect of thematic area-wise FLDs on the yield and economic returns in commercial crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Cotton	ICM	45	14.0	14.8	11.9	28.6	2.2	1.9
	Problematic soil management	8	5.0	18.6	18.5	0.5		
		53	**19.0**					
Sugarcane	ICM	15	7.0	1462	1205	21.9	3.2	2.8
	IPM	12	5.0	872	692	26.0	3.1	2.5
	Sustainable Sugarcane Initiative (SSI)	10	2.0	1590	1010	57.4	3.2	2.3
		37	**14.0**					
Mulberry (biomas yield/year)	IPM	10	4.0	15052	10260	46.7	1.7	1.1
		100	**37.0**					


Demonstration on pheromone trap in sugercane at Salem

Fodder crops: KVKs of Tamil Nadu demonstrated improved fodder crops in 83 farmers' fields covering an area of 44.1 ha during the year (Table 34). In all the fodder crops demonstrated, the fodder yield was higher to the extent of 20.5% to 57.7% over farmers' practice. Among the technologies, mixed fodder production resulted in significantly higher yield of 2507 q/ha compared to that of sole crops production (Table 34).

Table 34: Effect of thematic area-wise FLDs on the fodder yield and economic returns in fodder crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Desmanthus	Integrated Farming System	19	9.8	23.6	19.5	22.4	2.6	2.2
Guinea grass	Guinea grass CO(GG)3	36	7.3	1168.0	898.0	29.6	3.5	2.7
Guinea grass	Guinea grass CO(GG)3 under coconut shade	15	6.0	40.2	25.5	57.7	2.7	1.4
Mixed fodder crops	Mixed fodder crops-Co-4, COFS 29, Desmanthus	13	21.0	2507.0	2088.0	20.5	5.0	2.2
		83	**44.1**					

Seed production of fodder sorghum Co(FS)29 at Vellore

Vegetable crops: Important vegetable crops such as amaranthus, brinjal, cabbage, chilli, cluster bean, coccinia, field bean, french bean, onion, tomato, lab lab and vegetable cowpea were demonstrated with improved technologies in 287 farmers' fields covering an area of 77.1 ha (Table 35). Cultivation of amaranthus in 20 farmers' fields recorded 100 q/ha green yield with BCR of 3.6 while that in farmers' practice was 3.0 (Table 35). In brinjal, demonstration of ICM and integrated shoot and fruit borer management recorded over 20% yield. In cabbage, improved water management resulted in production of 620 q/ha cabbage yield with BCR of 1.83 (Table 35). Introduction of KKM-1 variety and demonstration of IDM in chilli clearly demonstrated their superiority over local check by registering an increase of 24% to 26% in green chilli yield. In cluster bean, cvs. Pusa Naubahar and Arka Suvidha out yielded their local checks in the KVK demonstrations recording higher BCR (Table 35). Varietal introduction in coccinia (Co-1), french bean (Arka Anoop), vegetable cowpea (PKM-1) and lab lab (Co(Gg)-14) have clearly demonstrated their superiority over local checks by registering higher yields ranging from 17.3% in Arka Anoop to 65.4% in PKM-1. Demonstrations on ICM in onion, field bean and bush type lab lab also recorded their superiority over local check both in terms of yield and economics. In onion cv. Co-(on)-5, seed production resulted in higher BCR of 3.2 (Table 35).

Table 35: Effect of thematic area-wise FLDs on the yield and economic returns in vegetable crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Amaranthus	Crop diversification	20	4.0	100.0	75.0	33.3	3.6	3.0
Brinjal	ICM	25	8.0	357.5	301.5	18.6	3.1	2.2
	Integrated management of shoot and fruit borer	10	4.0	275.0	235.0	17.0	2.2	1.7
		35	12.0					
Cabbage	Water management	2	0.4	620.0			1.8	
Chilli green	High yielding variety (KKM 1)	10	4.0	293.0	235.0	24.7	3.1	1.9
	IDM	10	4.0	128.0	101.0	26.7	2.3	1.9
		20	8.0					
Clusterbean	Crop Production - Pusa Naubahar	10	2.0	43.5	25.1	73.7	3.7	2.8
	Problematic soil management Arka Suvidhā perennial	10	1.5	189.0	134.0	41.0	2.8	1.6
		20	3.5					

Table 35 (Continued)

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha) Demo	Check	% increase over check	B:C ratio Demo	Check
Coccinia	Varietal introduction (Co-1)	10	2.0	178.5	152.3	17.2	1.4	1.2
Field bean	ICM	10	2.0	65.6	57.0	15.1	2.3	1.8
French bean	Varietal introduction (Arka Anoop)	12	2.4	104.8	89.4	17.3	2.8	2.3
Lablab	Variety introduction (Co(Gb)-14)	12	2.4	88.5	71.2	24.3	4.0	3.5
	Demonstration of bush type lablab	20	3.0	79.6	52.0	19.7	3.4	2.2
		32	**5.4**					
Onion	ICM	15	5.4	137.8	97.8	41.3	4.9	3.6
	IPDM	10	4.0	148.3	121.0	22.6	2.3	1.7
	Seed production in Onion CO (On) 5	10	1.0	1.2			3.2	
Small onion	ICM	10	5.0	187.5	150.0	25.0	3.3	2.3
		45	**14.5**					
Tomato	IPM	16	7.0	270.0	189.7	43.8	3.9	2.7
Vegetable cowpea	ICM	30	6.0	144.1	111.5	31.9	2.6	2.3
	Variety introduction (PKM-1)	35	9.0	103.3	66.9	65.4	2.5	2.2
		65	**15.0**					
		287	**77.1**					

ICM in brinjal at Vellore

Fruit crops: Demonstrations in banana, mango and acid lime were conducted in 178 farmers' fields covering an area of 57.2 ha during year in the state of Tamil Nadu by KVKs (Table 36). In banana, improved technology packages like ICM, INM, IPM and improved variety introduction have shown their superiority in farmers' fields by registering over 20% yield increase and higher BCR as compared to their local checks. Similarly, in mango demonstrations of INM and IPM recorded higher yield of 175 and 171 q/ha respectively as against 142 and 148 q/ha in their local check. Acid lime demonstration with ICM also gave higher yield of 121.9 q/ha as against 102.6 q/ha in local check (Table 36).

Table 36: Effect of thematic area-wise FLDs on the yield and economic returns in fruit crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha) Demo	Check	% increase over check	B:C ratio Demo	Check
Acid lime	ICM	20	4.0	121.9	102.6	18.8	3.6	2.8
Banana	ICM in Yelakki banana	45	16.0	204.8	170.5	23.6	4.7	3.9
	INM in Yelakki banana	20	8.0	365.8	303.8	19.8	2.8	2.4
	IPM in Yelakki banana	58	16.2	271.4	218.6	24.7	7.2	5.9
	Variety introduction-G-9	5	1.0	610.9	437.1	39.8	2.2	1.8
		128	**41.2**					
Mango	INM	10	4.0	175.0	142.0	23.2	3.3	2.6
	IPM	10	4.0	171.0	148.0	15.5	3.5	3.3
	Ripening technology	10	4.0	25% (TSS)	22% (TSS)	13.6	3.6	3.2
		30	**12.0**					
		178	**57.2**					

Flower crops: A total of 75 demonstrations were conducted on major flowers such as chrysanthemum, jasmine, marigold, rose and tuberose covering an area of 22.4 ha during the year (Table 37). Demonstration of ICM in chrysanthemum, jasmine, marigold and rose has enhanced the flower production in these crops ranging from 22.8% in jasmine to 40% in rose over local check. Introduction of cv. Phule Rajini in tuberose also gave better yield of 20.1 q/ha as against 14 q/ha in local check (Table 37).

Table 37: Effect of thematic area-wise FLDs on the flower yield and economic returns in flower crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha) Demo	Check	% increase over check	B:C ratio Demo	Check
Chrysanthemum	ICM	25	6.4	152.9	124.1	25.3	3.0	2.3
Jasmine	ICM	10	4.0	70.0	55.0	27.3	3.0	1.9
Marigold	ICM	10	4.0	160.0	125.0	28.0	3.3	2.8
Rose	ICM	10	4.0	70.0	50.0	40.0	2.3	2.0
Tuberose	Variety introduction (Phule Rajini)	20	4.0	20.1	14.0	41.3	2.1	1.9
		75	**22.4**					

Comparision of flowering habits of chrysanthemum Co 1 and local variety at Salem

Spice crops: A total of 58 frontline demonstrations were conducted in spice crops like coriander, cury leaf, garlic, ginger and turmeric covering an area of 12.5 ha during the year by KVKs of Tamil Nadu (Table 38). Demonstration of ICM in these crops clearly established its superiority by recording an increase in yield ranging from 6.0% to 39.8%. In ginger, IPM demonstration resulted in higher yield (150 q/ha) as compared to 125q/ha with local check (Table 38).

Plantation crops: Improved front line technologies were demonstrated in cashew, cocoa, coconut and tea in 94 farmers' fields covering an area of 35.2 ha by the KVKs in Tamil Nadu (Table 39).

Table 38: Effect of thematic area-wise FLDs on the yield and economic returns in spice crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Coriander	ICM (Seed)	10	4.0	5.5	4.1	34.2	3.7	2.9
Curry leaf (leaf/harvest)	Cropping systems	15	0.06	34.3	24.5	39.8	2.9	2.6
	ICM	10	0.4	10.3	8.0	28.1	2.4	1.5
		25	**0.46**					
Garlic	ICM	8	2.0	149.7	141.2	6.0	3.2	2.4
Ginger	IPM	10	4.0	150.0	125.0	20.0	3.1	2.1
Turmeric	ICM	5	2.0	66.3	58.7	13.0	2.1	1.6
		58	**12.46**					

Demonstrations on IPM in cashew, cocoa and coconut showed better results in terms of yield and economic returns (Table 39). In coconut, the nut yield increased up to 39.1% due to ICM and 18.6% due to INM demonstration over local check (Table 39). Similarly in tea, INM and IDM demonstrations showed superiority over farmers' practices by recording higher tea yield and economic returns.

Table 39: Effect of thematic area-wise FLDs on the yield and economic returns in plantation crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Cashew	IPM	10	4.0	4.4	3.8	15.8	2.9	2.9
Cocoa	Management of sucking pests	10	4.0	8.3	6.3	32.0	3.5	2.4
Coconut (Nuts/ha)	ICM	10	4.0	25600	18400	39.1	1.7	2.9
	INM	22	8.8	12278	10321	18.6	2.7	2.0
	IPM	30	12.0	16346	13165	23.9	2.7	2.4
		62	**24.8**					
Tea	IDM	5	1.0	142.2	114.1	24.7	1.4	1.3
	INM	5	1.0	129.9	110.5	17.6	1.4	1.3
	Land development	2	0.4	33.8	0.0		2.2	
		12	**2.4**					
		94	**35.2**					

Tuber crops: Crops such as cassava and potato were demonstrated with mechanization and IPM in 27 farmers' fields covering an area of 9.4 ha during the year. The results indicated the superiority of demonstrated technologies by registering higher yield and economic returns on investment (Table 40).

Table 40: Effect of thematic area-wise FLDs on the yield and economic returns in tuber crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Cassava	Farm mechanization	10	4.0	300.0	225.0	33.3	2.5	1.5
	IPM	10	5.0	180.0	150.0	20.0	3.6	3.5
Potato	Introduction of variety (Kufri Neelima-seed purpose)	7	0.4	43.8	-	-	0.9	-
		27	**9.4**					

3.1.2.3 Kerala

A total of 849 frontline demonstrations on cereals, millets, vegetable crops, tuber crops, plantation crops, spices and fruit crops covering an area of 143.89 ha were conducted by KVKs of Kerala during the year. The crop-wise results are discussed as in the following paragraphs.

Cereals and millets: Under this category, 113 frontline demonstrations were conducted on improved technology packages like ICM, IDM, INM, pest management and introduction of better varieties in paddy, introduction of sweet corn maize and foxtail millet covering an area of 35.2 ha (Table 41). All the demonstrated technologies in paddy reorded higher yield ranging from 19 to 40% as against their local check except in the case of introduction of cvs. Prathayasa and Vaisakh of paddy which resulted lower yield than their local check. However, due to their medicinal value, the economic returns to investment were higher as reflected by higher BCR. Introduction of foxtail millet in Kerala recorded a yield of 20 q/ha with BCR of 1.6 (Table 41).

Table 41: Effect of thematic area-wise FLDs on the yield and economic returns in cereal crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Paddy	ICM	19	5.4	61.3	43.7	40.0	2.7	1.8
	IDM	15	2.4	73.3	51.7	42.9	2.0	1.4
	INM	10	4.0	53.5	39.5	35.4	2.0	1.5
	Pest management and monitoring	31	17.0	36.6	30.7	19.0	2.7	1.7
	Variety Introduction (Vaisakh, Pra thayasa)	27	6.4	38.2	44.2	-11.6	2.3	2.1
		102	**35.2**					
Maize	Introduction of sweet corn maize- Madhuri	1	0.02	70.0	-	-	2.0	-
Foxtail millet	Crop diversification	10	0.02	20.0	-	-	1.5	
		113	**35.24**					

Rice farming at Pathanamthitta

Vegetable crops: During the year, vegetable crops such as amaranthus, bitter gourd, brinjal, cabbage, cauliflower, vegetable cowpea, cucumber, onion, palak, yard long bean and watermelon were demonstrated under frontline technologies in 390 farmers' field covering an area of 50.3 ha (Table 42). Introduction of new cvs. like Arka Suguna in amaranthus and all green in palak out yielded their local check with higher BCR. In bitter gourd, the demonstration of IPM gave higher yield (191 q/ha) followed by ICM (179 q/ha). Similarly, in brinjal, cabbage and cauliflower, IPM demonstration resulted in higher yield and economic returns to investment. In vegetable cowpea, demonstration of frontline technology packages such as ICM, IPDM, INM and micro nutrient management resulted in higher yields compared to farmers' practices (over 37%) and better economic returns. In cucumber and yard long bean, ICM and IPDM demonstrations also exhibited superior performance in terms of yield and economics. Introduction of onion and watermelon in Kerala by KVKs showed encouraging results with BCR of 2.6 and 1.8 respectively (Table 42).

Table 42: Effect of thematic area-wise FLDs on the yield and economic returns in vegetable crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield - (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Amaranthus	ICM	15	3.0	137.8	122.4	12.5	3.4	3.1
	Variety introduction (Arka Suguna)	25	10.3	125.0	102.7	21.7	1.7	1.5
		40	**13.3**					
Palak	Variety introduction (All green)	50	0.2	80.0	-	-	1.9	-
	Bittergourd	ICM	35	4.4	179.1	146.7	23.4	6.61.6
		IPM	25	17.0	191.0	130.9	46.1	3.62.9
		60	**21.4**					
Brinjal	IPM	20	2.0	250.0	180.0	38.9	3.0	2.4
Cabbage	IPM	55	0.56	432.0	342.0	26.3	2.1	1.7
Cauliflower	IPM	30	0.24	225.0	180.0	25.0	2.1	1.7
	ICM	10	0.08	187.5	-	-	1.9	-
		40	**0.32**					
Vegetable Cowpea	ICM	40	2.4	127.1	92.8	41.8	2.1	1.6
	IPDM	10	2.0	165.0	108.0	52.8	2.1	1.4
	Micronutrient management	7	0.38	228.1	145.3	57.0	2.6	1.7
	INM	10	0.8	110.0	80.0	37.5	1.6	1.1
	Irrigation management	10	0.15	222.0	178.0	24.7	2.0	1.4
		77	**5.73**					
Cucumber	ICM	20	5.5	313.8	273.8	14.6	3.0	2.7
Onion	Crop Diversification	8	0.2	108.0	-	-	2.6	-
Yard long bean	IPDM	10	0.04	156.0	125.0	24.8	2.3	1.8
Watermelon	Crop diversification	10	1.0	594.0	-	-	1.8	-
		390	**50.25**					

Demonstration on yard long bean at Pathanamthitta

Tuber crops: A total of 65 demonstrations on frontline technologies in tuber crops like amorphophallus, cassava, sweet potato and colocasia were under taken in 13.8 ha area (Table 43). Demonstration on ICM in amorphophallus, colocasia and sweet potato resulted in higher yield and better economic returns (Table 43). In cassava, IPM, intercroping in coconut plantations and integrated weed management demonstrations recorded impressive yield increase (51.3, 69.8 and 11 % respectively) over local practices (Table 43).

Table 43: Effect of thematic area-wise FLDs on the yield and economic returns in tuber crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Amorphophallus	ICM	10	1.0	499.5	493.0	1.3	1.8	1.5
Cassava	Cropping systems	20	0.6	472.5	315.0	51.3	3.3	2.2
	IPM	10	8.0	236.0	139.0	69.8	1.4	1.2
	Integrated weed management	10	4.0	231.6	208.7	11.0	1.6	1.5
		40	**12.6**					
Colocasia	ICM	5	0.1	184.0	121.0	52.1	2.7	1.8
Sweet potato	Crop diversification	10	0.1	100.0	70.0	42.9	2.0	1.4
		65	**13.8**					

Demonstration on intercropping bush cowpea in cassava for control of weeds at Pathanamthitta

Plantation crops: Frontline technologies were demonstrated in important plantation crops of Kerala like arecanut, cocoa and coconut in 79 fields of farmers covering an area of 16.1 ha during the year (Table 44). Technologies like pest management in arecanut and IDM in cocoa showed superiority of technology with increased yield up to 9.6 % in arecanut and 44.8% in cocoa over local check. In coconut, INM, IPM, micro nutrient management and integrated farming all expressed over 14% nut yield increase with better BCR as compared to farmers' practice (Table 44).

Table 44: Effect of thematic area-wise FLDs on the yield and economic returns in plantation crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Arecanut	Pest management	4	1	19.5	17.8	9.6	2.0	2.0
Cocoa	IDM	10	5	21.0	14.5	44.8	2.2	1.6
Coconut (Nuts/ha)	INM	20	2	19200	13600	41.2	2.6	2.1
	IPM	13	5.2	12800	9920	29.0	1.5	1.3
	Micronutrient management	12	2.5	13440	10560	27.3	1.6	1.3
	Integrated Farming System (IFS)	20	0.4	12800	11200	14.3	2.2	1.3
		65	**10.1**					
		79	**16.1**					

Spice crops: Frontline technologies were demonstrated in spice crops such as black pepper, cardamom, curry leaf and ginger in 63 farmers' fields covering an area of 5.8 ha (Table 45). Demonstration of INM in adult black pepper and nursery seedlings has resulted in better results as compared to local check. The variety introduction in black pepper viz. Karimunda, Kalluvally, Aimpiriyan have also performed superiorly with better economic returns (Table 45).

Table 45: Effect of thematic area-wise FLDs on the yield and economic returns in spice crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Black pepper	INM	10	0.4	2.6	2.1	23.8	2.0	1.7
	INM in nursery (lakh seedlings)	10	0.2	3.4	3.0	13.3	3.0	2.7
	Variety introduction-Karimunda, Kalluvally, Aimpiriyan	10	0.22	17.5	-	-	2.5	-
		30	**0.82**					
Cardomom	INM	10	1.0	8.9	7.0	27.1	2.5	2.0
	IPM	10	3.5	7.2	5.7	26.3	2.1	1.8
		20	**4.5**					
Curry leaf	Crop diversification	3	0.03	24.8	-	-	1.4	-
Ginger	Variety introduction-Varada	10	0.4	147.0	142.5	3.2	3.4	3.4
		63	**5.75**					

Demonstration on black pepper at Calicut

Fruit crops: Frontline technologies were demonstrated in fruit crops such as, banana and mango in 139 fields of farmers covering an area of 22.8 ha (Table 46). In banana, ICM demonstration performed better with 282.9 q/ha followed by IPM (259.3 q/ha), INM and IDM (255 q/ha). The per cent increase in yield was highest with IPM demonstration as against local check. In mango, IPM demonstration could enhance the fruit yield by 35.9 % as compared to local check (Table 46).

Table 46: Effect of thematic area-wise FLDs on the yield and economic returns in Fruit crops

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Banana (Kadali)	ICM	55	7.2	282.9	226.7	24.9	3.3	2.8
	IDM	25	5.0	255.0	195.0	30.8	1.8	1.4
	INM	30	2.4	255.0	210.8	21.1	3.8	3.4
	IPM	15	2.0	259.2	195.1	34.01	2.2	1.7
		125	**16.6**					
Mango	IPM	14	6.1	53.0	39.0	35.9	2.7	1.8
		139	**22.8**					

3.1.2.4 Goa

During the year, 154 frontline demonstrations were conducted by two KVKs of Goa covering an area of 19.3 ha (Table 47). Major crops covered under demonstrations were paddy, groundnut, greengram, sugarcane and cucumber in which ICM and IPM packages were demonstrated. Paddy performed very well under ICM with 48.3 % increase in yield followed by problematic soil management (8.1%). Yield recorded under ICM demonstration was 23.4 q/ha in groundnut, 10 q/ha in greengram and 684 q/ha in sugarcane, all of which were superior to their local checks. In cucumber, IPM demonstration gave 42.25% increased yield as well increased BCR of 1.7 as compared to 1.3 under check plot (Table 47).

Table 47: Effect of thematic area-wise and crop-wise FLDs on the yield and economic returns in Goa

Crop	Thematic Area	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Paddy	ICM	23	4.0	70.7	47.6	48.3	4.0	2.8
	Problematic soil management	2	0.2	46.5	43.0	8.1	2.0	1.8
Groundnut	ICM	81	5.9	23.4	17.8	31.3	3.6	3.2
Greengram	ICM	29	6.2	10.0	7.5	33.3	3.9	3.0
Sugarcane	ICM	4	2.0	684.0	550.0	24.4	1.7	1.3
Cucumber	IPM	15	1.0	133.0	93.5	42.2	3.2	1.6
		154	19.3					

Demonstration of cucumber at Goa

3.1.2.5 Lakshadweep

The only KVK in Lakshadweep undertook 24 frontline demonstrations in coconut in ICM and IDM in 1.3 ha area of coconut garden of farmers. ICM demonstration recorded 14.8% increase in nut yield as compared to IDM with 13.6% increase over their local checks (Table 48).

Table 48: Effect of thematic area-wise FLDs on the nut yield and economic returns in coconut

Crop	Thematic Area	No. of farmers	Area (ha)	Yield -(nuts/ha)		%increase over check	B:C ratio	
				Demo	Check		Demo	Check
Coconut (Nuts/ha)	ICM	4	0.1	6200	5400	14.8	3.5	3.7
	IDM	20	1.2	5000	4400	13.6	4.2	5.4
		24	1.3					

3.1.2.6 Pondicherry

Two KVKs in Pondicherry conducted 43 front line demonstrations on mechanization, ICM, IPM in paddy and INM in groundnut covering an area of 17 ha during the year (Table 49). Paddy performed superior with mechanization, ICM and IPM technologies demonstration as compared to their local checks by recording over 6% yield increase. In groundnut, INM demonstration resulted in an increase of 22.8% yield over local check (Table 49).

Table 49: Effect of thematic area-wise and crop-wise FLDs on the yield and economic returns in Pondicherry

Crop	Thematic Area	No. of farmers	Area (ha)	Yield -(q/ha)		% increase over check	B:C ratio	
				Demo	Check		Demo	Check
Paddy	Farm mechanization	10	4	48.0	44.2	8.6	2.1	1.4
	ICM	10	4	58.1	54.3	7.1	1.9	1.8
	IPM	10	4	48.0	45.3	6.1	1.9	1.7
Groundnut	INM	13	5	32.5	26.5	22.8	2.6	2.3
		43	17					

Demonstration on IPM in paddy at Karaikal

3.1.2.7 Hybrids

During the year, 1344 demonstrations on hybrids in various crops were conducted by 81 KVKs of Zone-VIII covering 472.92 ha area in crops like paddy, maize, sorghum, bajra, sunflower, castor, cotton, baby corn, chilli, bhendi, brinjal, cabbage, cauliflower, tomato, bottle gourd, onion, tomato, watermelon, musk melon and tuberose. Hybrids demonstrations have clearly out yielded local checks in all the crops during the year. The state-wise results are discussed as under:

3.1.2.7.1 Karnataka

A total of 672 demonstrations were conducted by 31 KVKs involving various hybrids (Table 50). In cereals, the yield increase in hybrid demonstrations was 13.8 % in paddy, 7.4 to 23.1% in maize and 20.8 to 43.9% in bajra. Hybrids like KRH-4 in paddy, CP-818 in maize and Pioneer 8652 in bajra out yielded their local checks by registering higher increase in yield (Table 50). In sunflower hybrids the increase in yield ranged from 7.1% in ICI-18 to 18.3% in Kargil-167 (Table 50). The cotton hybrids also out yielded their local checks to the extent of 8.9% to 32.6% (Table 50). In vegetables, Mahyco-10 in brinjal, Arka Meghana in chilli, Abhinav and Arka rakshak in tomato, Namdhari 295 in watermelon performed superior to other hybrids under frontline demonstrations in farmers' fields (Table 50).

Table 50: Effect of FLDs on hybrids on the yield and economic returns in Karnataka

Crop Category	Crop	Name of Hybrid	No. of farmers	Area (ha)	Yield (q/ha) Demo	Yield (q/ha) Check	% increase over check	B:C ratio Demo	B:C ratio Check
Karnataka									
Cereals	Paddy	KRH-4	6	5.0	76.3	67.0	13.8	3.7	2.6
		MAS-26	7	3.0	38.0	0.0		3.9	
	Maize	DKC 8101	10	4.0	57.5	48.5	18.6	2.8	2.2
		Hema (NAH-1137)	48	20.0	57.1	53.2	7.4	3.0	2.8
		Nithyashree	6	3.0	56.9	52.2	9.0	2.4	2.1
		Seed Tech 740	10	4.0	63.6	52.3	21.5	3.3	3.0
		900M Gold	40	16.0	56.7	48.0	18.3	4.5	3.9
		CP-818	33	14.0	49.0	40.4	23.2	2.3	2.1
		Dekalb-913	20	8.0	58.6	54.2	8.3	2.6	2.5
Millets	Bajra	Pioneer-86 M88	20	8.0	15.9	13.1	20.8	2.4	2.4
		Pioneer-8652	25	10.0	17.3	12.0	43.9	1.9	1.3
Oilseeds	Sunflower	ICI-18	30	10.0	21.0	19.6	7.1	4.7	4.2
		Kargil 167	12	5.0	11.0	9.3	18.3	3.0	2.4
		KBSH-53	31	13.8	12.4	10.9	13.6	2.5	2.2
		RSFH-130	12	5.0	8.3	7.5	10.0	1.7	1.5
		SF64S99	10	4.0	10.0	9.3	7.2	1.5	1.5
Fibre crops	Cotton	Arjuna (Bt)	10	5.0	17.0	12.8	32.8	2.2	1.9
		Jadoo (Bt)	10	4.0	37.8	34.7	8.9	3.9	3.5
		Kanaka (Bt)	45	18.0	21.2	19.6	9.5	5.2	4.8
		Menaka (Bt)	10	4.0	14.3	10.8	32.6	2.1	1.5
		Minerva (Bt)	1	1.0	9.2	7.3	25.5	1.8	1.5
		MRC-6918 (Bt)	13	5.2	17.0	13.8	23.6	3.0	2.3
		MRC-7351 (Bt)	10	4.0	19.8	15.2	30.3	2.8	2.3

Table 50: (*Contd...*)

Crop Category	Crop	Name of Hybrid	No. of farmers	Area (ha)	Yield (q/ha) Demo	Yield (q/ha) Check	% increase over check	B:C ratio Demo	B:C ratio Check
Vegetable Crop	Brinjal	Arka Anand	16	3.0	95.7	84.8	14.0	3.6	2.8
		Mahyco 10	16	7.0	233.9	188.3	23.5	5.1	3.3
		MEH -11	5	2.0	336.5	318.6	5.6	5.8	4.6
	Cabbage	Unnati	9	2.2	279.6	242.9	18.6	2.5	1.9
	Cauliflower	Bheeshma	15	2.0	275.0	258.0	6.6	3.4	2.8
	Chilli (green)	Arka Meghna	32	9.0	170.0	107.0	61.9	3.7	2.9
		Numhemps	12	5.0	279.5	255.5	9.4	4.0	3.2
		Sitara	1	1.2	211.3	168.0	25.8	2.2	1.6
	Cucumber	Malini	10	2.0	231.0	197.0	17.5	3.1	2.7
	Polebean	Srujana	7	3.5	351.0	315.0	11.4	3.7	2.3
	Tomato	Abhinav	5	2.0	630.0	517.5	21.7	4.1	3.3
		Arkarakshak	61	21.7	598.5	498.0	20.9	2.8	2.3
		Mahyco, PTR-6	2	6.0	187.5	177.5	5.6	1.2	1.0
		NS-555	8	1.6	720.0	670.0	7.5	3.2	2.8
		Arka Samrat	10	1.0	250.0	210.0	19.1	3.3	2.7
		Namadari	10	2.0	515.0	443.0	16.3	3.2	2.8
	Watermelon	Hachi Vichi	12	5.0	485.0	435.0	11.5	3.4	3.2
		Namdhari 295	10	2.0	395.0	322.0	22.7	2.8	2.4
		Sugar Queen	8	5.2	545.0	465.0	17.2	2.9	2.5
			668	**257.4**					

Demonstration on castor DCH 177 at Ramanagar

3.1.2.7.2 Tamil Nadu

A total of 608 frontline demonstrations were conducted covering 218 ha involving hybrids of various crops (Table 51). In cereals, hybrids such as Co-4 in paddy, NK 6820 in maize, Co-(Cu)-9 in bajra, Co-5 in sorghum have performed superior under frontline demonstrations. Among vegetables, Co(Bh)H-1in bhendi, Co(ashgourd)h-1 in ahsgourd, G-5414 in baby corn, Abhishek in bitter gourd, PLR-2 in brinjal, Co-1 in bottle gourd, Sandox in cabbage, Arka Meghana in chilli, PMK-1 in cowpea, CoLCRH-3 in tomato and MHW-6 in watermelon recorded higher yields over their local check (Table 51). In fruits, hybrid Kundan of musk melon performed better with 27.9% increase in yield over local check (Table 51). In tuberose, Prajwal hybrid recorded 61.7 q/ha as against 50.5 q/ha in local check variety (Table 51). The cotton hybrid MRC-7918 (bt) recorded 92.1% increase in yield over local check. Among oilseed crops, Sunbred 275 in sunflower and YRCH 1 in castor recorded higher yield over their local checks to the extent of 39.7% and 49.8% respectively (Table 51).

Table 51: Effect of FLDs on hybrids on the yield and economic returns in Tamil Nadu

Crop Category	Crop	Name of Hybrid	No. of farmers	Area (ha)	Yield (q/ha) Demo	Check	% increase over check	B:C ratio Demo	Check
Cereals	Paddy	CO4	10	2.0	70.3	48.1	46.1	2.9	2.4
		CORH 4	12	5.0	61.6	48.3	27.5	1.9	1.7
		Koraknath	10	4.0	83.0	75.3	10.2	2.3	2.1
	Maize	Arjuna	5	2.0	26.0	21.8	19.3	2.1	1.4
		COHM-6	134	55.0	61.0	54.0	14.4	2.8	2.4
		Hema(NAH1137)	8	8.0	68.3	56.4	21.1	2.2	2.1
		NK 6240	10	4.0	48.8	43.6	11.9	2.7	2.1
		NK6820	10	4.0	34.0	25.0	36.0	1.7	1.6
		Pioneer	12	5.0	47.6	42.7	11.5	1.9	1.9
Millets	Bajra	Co (Cu) 9	32	14.0	26.6	19.5	40.9	3.1	2.1
	Sorghum	Co5	24	7.0	22.6	17.2	31.1	2.4	2.1
Vegetabl e crops	Bhendi	Co(Bh)H1	10	1.0	167.1	117.3	42.5	3.3	2.2
	Bhendi	Co (Bh) H-1	16	2.0	61.2	30.5	100.7	2.7	1.7
	Ashgourd	CO(Ash Gourd)hybri d-1	15	6.0	210.3	163.0	26.9	3.7	2.9
	Baby corn	G-5414	10	2.0	50.0	-	-	2.8	-
	Bittergourd	Abhishek	10	1.0	422.3	330.2	27.9	2.5	1.8
	Bottlegourd	Co 1	10	2.0	292.0	238.0	23.0	3.9	2.9
	Brinjal	PLR 2	10	2.0	299.0	251.0	19.1	3.1	2.6
	Cabbage	Sandox	10	4.0	328.0	285.0	15.1	2.2	1.5
	Chilli dry	CochH 1	10	2.0	18.7	16.2	15.5	2.1	2.9
	Chilli green	Arka Meghna	10	4.0	210.4	170.9	23.1	2.6	2.3
	Cowpea	PKM-1	10	4.0	40.0	30.0	33.3	2.4	2.0
		Mahyco 10	10	4.0	144.0	119.0	21.0	2.1	1.6
	Onion	Co(on) 5	20	6.0	175.5	148.9	17.9	6.3	29.1
	Tomato	Mahyco5005	10	4.0	932.5	812.6	14.8	0.4	0.5
		CoLCRH-3	10	2.0	743.6	570.6	30.3	2.6	2.1
		COTH 3	8	2.0	500.0	398.0	25.6	2.6	1.9
		Sivam	5	2.0	240.0	190.0	26.3	2.8	2.3
	Watermelon	H 20 (Namdhari)	10	2.0	187.0	138.0	35.5	2.4	1.9
		MHW-6	10	2.0	207.0	110.3	87.7	3.7	2.6
		Pakeeza	10	2.0	517.5	450.0	15.0	6.0	4.4

Table 51: Effect of FLDs on hybrids on the yield and economic returns in Tamil Nadu (contd..)

Crop Category	Crop	Name of Hybrid	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
Fruit crops	Musk melon	Kundan	5	2.0	121.9	95.3	27.9	2.0	1.8
Flower crops	Tuberose	Prajwal	5	1.0	61.7	50.5	22.1	2.6	2.2
Fibre crops	Cotton	MRC 7918 (Bt)	5	4.0	39.6	20.6	92.1	5.2	1.8
		RCH 708 (Bt)-dryland	10	4.0	9.9	8.0	24.1	3.4	2.3
Oilseeds	Sunflower	Co2	22	9.0	19.3	16.6	15.5	2.6	2.2
		Sunbred 275	15	6.0	14.7	10.5	39.7	2.4	1.8
	Castor	YRCH1	65	26.0	15.7	10.8	49.8	3.4	2.6
			608	**218.0**					

Comparision of maize hybrids at Salem

3.1.2.7.3 Kerala

A total of 48 hybrids were demonstrated in cabbage (NS 43) and chilli (Anugraha) by KVKs of Kerala during the year. Both the hybrids out yielded their local checks to the extent of 14 to 32.5% (Table 52).

Table 52: Effect of FLDs on hybrids on the yield and economic returns in Kerala

Crop Category	Crop	Name of Hybrid	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
Vegetable crops	Cabbage	NS 43	40	0.004	42.5	32.1	32.5	2.4	2.0
	Chilli (green)	Anugraha	8	0.02	86.2	75.4	14.3	2.3	2.1

3.1.2.7.4 Lakshadweep

In brinjal, Arka Anand was demonstrated in 6 farmers' fields by the KVK during year. The yield recorded by hybrid was 290 q/ha against 214 q/ha in local check (variety) (Table 53).

Table 53: Effect of brinjal hybrid on the yield and economic returns under FLDs in Lakshadweep

Crop Category	Crop	Name of Hybrid	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
Vegetable crops	Brinjal	Arka Anand	6	0.7	290.0	214.0	35.5	4.5	4.7

3.1.2.7.5 Pondicherry

In marigold, East West Yello Max hybrid was demonstrated in 10 farmers' fileds by the Pondicherry KVK during the year. The yield reorded was 180 q/ha with impressive BCR of 4.4 (Table 54).

Table 54: Effect of marigold hybrid on the yield and economic returns under FLDs in Pondicherry

Crop Category	Crop	Name of Hybrid	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
Flower crops	Marigold	East West Yellow max	10	0.4	180.0	-	-	4.4	-

3.1.2.8 Livestock and fisheries

During the period under report, 610 demonstrations on livestock, poultry, sheep & goat, piggery, poultry and fisheries were taken up by 81 KVKs of the Zone. The state-wise details of technologies demonstrated and their performance are presented as below.

3.1.2.8.1 Karnataka

A total of 188 demonstrations were conducted, of which 97 were on dairy cow, 27 on fisheries, 11 on goat, 33 on piggery, 15 on sheep and 5 on poultry. The details of technology/breed/species demonstrated with net returns/demo and BCR are presented in Table 55.

Table 55: Effect of livestock and fisheries demonstrations on economic returns under FLDs in Karnataka

Livestock	Technology demonstrated	Breed/species	No of demonstrations	Net returns (Rs/demo)	BCR
Dairy Buffalo	Area specific mineral mixture in dairy cattle	Upgraded Buffalo	20	110	1.8
Dairy Cow	Achieving optimum post weaning growth in calves with probiotics and growth stimulants	Upgraded Buffalo calves	20	2600	1.5
	Area specific mineral mixture in dairy cattle	CB Cow	20	130	1.8
	Area specific Mineral mixture on Productive Performance of Milch animals	Jersey and HF	3	25500	2.7
	Azolla feding for livestock : Cultivation and feeding of Azolla to milking dairy animals	Jersey	9	18810	1.9
	Cultivation & feeding of perennial grasses and other forage crops to milking dairy animals to enhance milk yield	Jersey	25	26600	2.4
Fishery	Amur Common carp for higher productivity	Amur Common carp	4	72540	7.1
	Composite fish culture in farm pond	indian major carps	5	45860	6.4
	Integrated Fish Farming	Pangassius, Catla catla Labeo rohita	17	650000	5.3
	Production of ornamental fishes in backyard for additional income	Red sword tail, Green sword tail	1	5000	1.5

Table 55: (*Contd...*)

Livestock	Technology demonstrated	Breed/species	No of demonstrations	Net returns (Rs/demo)	BCR
Goat	Popularization of Sirohi breed through stall feeding	Sirohi	1		
	Disease Management in Goats	Osmanibad	10	440	1.7
Piggery	Effective treatment for Hind Limb paralysis in pigs	Duroc	20	70550	2.7
	Swine fever management in Piggery	Improved breeds	3	5233	2.6
	Upgradation of local pigs using Duroc Boars	Duroc	10	233400	4.9
Poultry Dual	Demonstration of Swarnadhara bird in backyard poultry	Swarnadhara	5	0	
Sheep	Management of Ecto Endo parasites in Sheep/Goat		5	973	1.3
	Management of Parasitic Infestation in sheep	Kenguri	10	294	15.0
			188		

Demonstration on hand operated machine milking at Davangere

3.1.2.8.3 Tamil Nadu

Out of total 236 demonstrations conducted during the year, 139 were on dairy cow, 37 on fisheries, 15 on goat, 5 on piggery, 10 on poultry, 5 on quails and 25 on sheep through introduction of high yielding breeds/species and nutritional mixture. The details of technology/breed/species demonstrated with net returns/demo and BCR are presented in Table 56.

Table 56: Effect of livestock and fisheries demonstrations on economic returns under FLDs in Tamil Nadu

Livestock	Technology demonstrated	Breed/species	No of demonstrations	Net returns (Rs/demo)	BCR
Dairy Cow	By-pass fat feed Supplementation	HF Cross & Jercy cross	20	27000	1.6
	Demonstration of area specific mineral mixture	Cross bred dairy cows	10	11893	1.8
	Demonstration of milking machine	HF cross	5	83.5	1.9
	Ethno veterinary medicine for treatment of mastitis	Jersey cross	5	4650	1.1
	Ethno Veterinary medicines for treatment of mastitis	HF cross	20	4748	1.8
	GRAND Supplement	Jersey	30	8663	1.3
	GRAND SUPPLEMENT in Cross bred dairy cows	Non descriptive	20	3480	1.7

Table 56: (*Contd....*)

Livestock	Technology demonstrated	Breed/species	No of demonstrations	Net returns (Rs/demo)	BCR
	Integrated Farming System	Jersy, Vanaraja, carp	4	102350	3.7
	Integrated Farming System	local	5	25900	1.8
	Paddy Straw Block	Cross Breeds	10	171	2.6
	Supplementation of By - pass fat feed in lactating dairy animals for prevention of delayed heat in postpartum dairy cows.	Jersey cross	10	4500	1.1
Fishery	Composite fish culturing with stunted fingerlings	Catla,Rohu, Mrigal, CC	4	10	2.8
	Demonstration of Seabass farming in freshwater	Seabass	5	216000	1.7
	Demonstration of shrimp feed fortified with poly herbal mix		5	270000	1.7
	Demonstration on Pangasius pangasius fish culture	Pangasius Pangasius	5	51200	1.6
	Hygienic production and marketing of value added fishery products	Carp	5	40000	1.8
	Ornamental fish rearing using small ring tanks in the backyard	Live bearers – Molly, Guppy, Sword tail	3	640	2.0
	Rearing of Fingerlings in hapas		5	3864	1.6
			37		
Goat	Demonstration of anthelamaetic minera l block	Tellichery	10	886	3.0
	Integrated Farming System	Tellicherry	5	7200	3.1
			15		
Sheep	FSH therapy to improve twinning in Mecheri sheep	Mecheri sheep	5	1400	1.2
	Demonstration of AIM blocks	Ramnad white	10	10750	3.2
	Herbal formula for control of Ectoparasites in Sheep and Goat	Local breeds	10	650	1.2
			25		

Table 56: (Contd..)

Livestock	Technology demonstrated	Breed/species	No of demonstrations	Net returns (Rs/demo)	BCR
Piggery	Swill feeding breeder pigs	Large white yorkshire pigs	5	3671	1.7
Poultry	Production of Namakkal Chicken -I	Namakkal chicken I	5	2075	1.6
Poultry Dual	Integrated Farming System	Giriraja	5	2323	3.1
			10		
Quail	Production and laying performance of Namakkal Gold Quail	Namakkal Gold Quail	5	64	1.2
			236		

3.1.2.8.4 Kerala

Out of total 172 demonstrations conducted, 97 were on dairy cow, 19 on fisheries, 15 on goat, 46 on poultry and 10 on rabbitary. The details of technology/breed/species demonstrated with net returns/demo and BCR are presented in Table 57.

Table 57: Effect of livestock and fisheries demonstrations on economic returns under FLDs in Kerala

Livestock	Technology demonstrated	Breed/species	No of demonstrations	Net returns (Rs/demo)	BCR
Dairy Cow	Flumethrin 1% pour-on solution to control of biting flies and ticks	Crossbred	30	35317	1.5
	Homemade ration for livestock and fishery	Crossbred	2	5000	1.4
	Integrated farming system at Farmers' Field	Poultry,Fodder,Paddy,Cow	3	647149	1.9
	Modification of dairy cattle rations incorporating household food wastes	Crossbred	12	153	3.4
	Stress management using cow mat	Crossbred	10	45212	2.4
	Urea molasis multi nutrient block for increasing milk yield	Cross breed	5	14725	2.0
	Use of anionic diet (DCAB) for prevention of Hypocalcamia	Crossbred	20	36500	1.4
	Use of area specific mineral mixture	Crossbred	15	38000	1.4
			97		
Fishery	Culture of potential Marine Fin fishes in low saline water bodies	Mullet	1	205500	5.6
	High density cage culture of Pearlspot in abandoned fresh water resources	Pearlspot	1	26208	2.2

Table 57: (*Contd....*)

Livestock	Technology demonstrated	Breed/species	No. of demonstrations	Net returns (Rs/demo)	BCR
Fishery	Bucket biofilter for maintaining water quality of ornamental fish culture tanks	Guppy, Platty, Sword tail	5	943	2.3
	Grass carp for controlling submerged aquatic weeds	Grass carp	12	500	2.7
			19		
Poultry Layer	Demonstration of Gramasree layer chicks	Gramasree	25	3910	4.1
	Disease management in poultry		20	150	1.3
	Popularisation of 'A' type cage system for rearing improved variety of layers	High yielding	1	863	1.1
			46		
Rabbitry	Rabbit management with low cost feed	Soviet Chinchilla	10	328	2.2
			172		

Demonstration of flumethrin as poron at Palghat

3.1.2.8.5 Goa

A total of 14 demonstrations were conducted by two KVKs of Goa State on composite fresh water carp, green mussel rope culture and integrated fish cum poultry. The details of performance of these demonstrations are presented in Table 58.

Table 58: Effect of fisheries demonstrations on economic returns under FLDs in Goa

Livestock	Technology demonstrated	Breed/species	No. of demonstrations	Net returns (Rs/demo)	BCR
Fishery	Composite fresh water carp culture	Indian major carps	10	373725	2.5
	Green mussel rope culture	Green mussel	2	43250	2.3
	Integrated Fish Poultry culture	Etroplus spp & vavaraja chicks	2	191500	3.8
			14		

3.1.2.9 Other enterprises

A total of 568 demonstrations were organized on other enterprises such as sericulture, mushroom, value addition in crops, apiary, nutrition garden, vermicomposting units etc. for income generation by the KVKs through establishment of SHGs and production units during the year (Table 59). In Karnataka, 304 demonstrations on silk worm rearing, value addition in millets and horticultural crops, vermicomposting etc were conducted by the KVKs through establishment of 89 units and 20 SHGs. A total of 199 demonstrations were conducted in the areas such as apiary, nutrition garden, mushroom, value addition in crops through branding and marketing by the KVKs of Kerala through establishment of 88 units (Table 59). In Tamil Nadu, KVKs organized demonstration on enterprises such as milk products production, mushroom, vermicomposting, silver tip tea production etc. through 35 units and 54 farmers during the year. In Lakshadweep, vermicomposting was demonstrated with 11 farmers as income generating activity (Table 59).

Table 59: Enterprises demonstrated during the year for increased income

State	Enterprise	Unit Size (No/unit)	No. of units	No. of farmers
Karnataka	Silkworm rearing	100 DFLs/batch	71	71
	Value addition to banana male flower bud–branding and market linkage	10	2 SHGs	20
	Drying of pepper by using LDPE sheets	1	10	10
	Innovative activity like branding and marketing	10	6 SHGs	60
	Jack RTS beverage (200 ml/bottle)	15	1 SHG	15
	Jackfruit- Branding and market linkage	10	2 SHGs	20
	Jackfruit jam	10	1 SHG	10
	Maize- Branding and market linkage	10	2 SHGs	20
	Maize Nutririch	10	1 SHG	10
	Maize Papad	15	1 SHG	15
	Nutrition Garden	1	5	5
	Ragi malt preparation	10	2 SHGs	20
	Ragi Papad	15	1 SHG	15
	Vermicompost unit	3x2x1.75 mtr	3	3
	Branding and market linkage to value added finger millet products	10	1 SHG	10
			89 units, 20 SHGs	**304**
Kerala	Apiary in homesteads	1 box	10	10
	Bee keeping in coconut gardens	5 boxes	5	20
	Nutrition garden	3 cents	10	10
	Health mix	1 Group	1	15
	Mushroom	Homesteads	42	87
	Pickle making		2	5
	Production of virgin coconut oil	100 nuts/batch	10	10
	Ragi vermicelli unit		1	10
	Shrimp /Mushroom		2	2
	Value addition of tuber crops		5	30
			88 units	**199**
Lakshadweep	Vermicompost	2.5q/lot	2	11
Tamil Nadu	Flavoured milk production	100 lit/batch	1	1
	Mushroom	27 m2	20	20
	Vermicomposting	4.0 m2	10	10
	Yoghurt	1 Group	1	20
	Banana fibre extraction machine	1	1	1
	Popularizing silver tips tea production in small tea grower society		2	2
			35 units	**54**
			G. Total	568


Sorting and grading of cocoons at Ramanagar

3.1.2.10 Farm Implements and tools

Farm mechanization was demonstrated through 582 demonstrations of various farm implements covering an area of 1044.2 ha during the year by the KVKs of Zone-VIII to ensure timely operations and labour saving. Of which, 292 demonstration on farm implements were conducted by KVKs of Tamil Nadu followed by 156 in Kerala, 90 in Karnataka, 34 in Lakshadweep and 10 in Pondicherry. State-wise details of implements demonstrated are presented in Table 60.

Table 60: Frontline demonstrations on farm implements

State	Crop	Implement/ Equipment demonstrated	No. of farmers	Area (ha)
Karnataka	Castor	Modified hand operated castor sheller	10	8.0
	Coconut	Safety belt for coconut climbing	2	2.0
	Oilseeds	Groundnut decorticator	5	2.0
	Paddy	Paddy Transplanter	8	5.0
	Pigeonpea	Spiral separator	60	870.0
	Sugarcane	Single eye bud cutter in sugarcane	5	5.0
			90	892.0
Kerala	Banana	String standard pseudostem support system	5	0.15
	Banana	Mini auger for pit opening	3	0.25
	Paddy	Demonstration of drum seeder for sowing	3	0.5
	Paddy	Machinery package for group mechanization	145	28.0
			156	28.9
Lakshadweep	Coconut	Coconut climbing device (TNAU model)	34	2.3
Pondicherry	Paddy	Nursery raising and transplanter	10	5.0
Tamil Nadu	Amla	Amla seed remover	10	0
	Banana	Motoraized Earth Augur	10	4.0
	Blackgram	Pulse harvester	10	4.0
	Blackgram	Tractor drawn zero till fertilizer cum seed drill	10	4.0
	Carrot	Mini mechanical machine harvester	20	2.0
	Field crops	Tractor mount weeder	5	2.0
	Cotton	Removal of Cotton stalks by using Brush cutter	5	5.0

Table 60: Frontline demonstrations on farm implements (*Contd..*)

State	Crop	Implement/ Equipment demonstrated	No. of farmers	Area (ha)
	Groundnut	Groundnut decorticator	10	4.0
	Groundnut	Groundnut stripper	10	4.0
	Groundnut	Seed drill and TD harvester	20	8.0
	Mango	Improved pruning shears	10	4.0
	Paddy	Combined harvester	20	4.5
	Paddy	Cono weeder	10	2.0
	Paddy	Direct paddy drum seeder	10	4.0
	Paddy	Laser guided land leveller	20	8.0
	Paddy	Transplanter, Power weeder, Combined harvester	47	16.3
	Pulses	Fertilizer cum seed drill	30	13.0
	Turmeric	TD harvester/Steam based turmeric Boiler	5	2.0
	Tea	Hand operated shear to harvest green leaf	2	0.8
	Tea	High volume sprayer in tea fields	5	10.0
	Greengram	HTP sprayer	23	11.0
		Tamil Nadu Total	292	112.6
		Grand Total	582	1044.2

Demonstration on group farming in mechanized paddy at Palghat

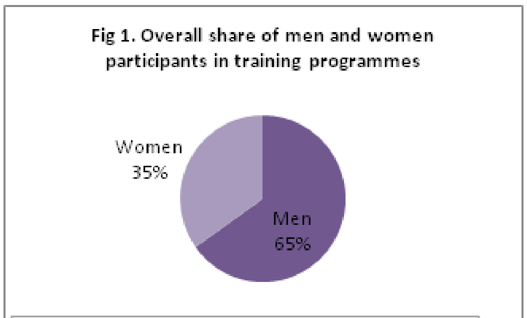
3.1.3 Capacity development

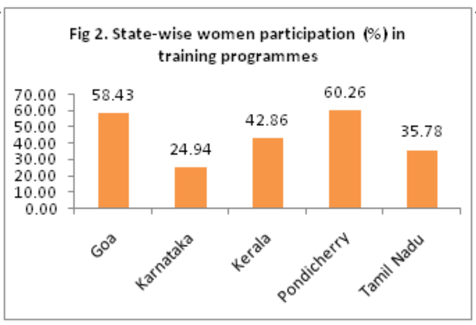
During the year under report, 9626 training courses were organized in which 327112 persons belonging to different categories participated. Majority of these (5950 courses) were for farmers/farm women category in which more than two lakh farmers/farm women were trained. More than two thousand training courses (2098) were organized under Sponsored Programmes category involving 74544 participants. State-wise break-up indicates that 50 % of the training courses were organized in Tamil Nadu. Details are given below (Table 61):

Table 61: State-wise and category-wise number of training courses organized and the number of participants

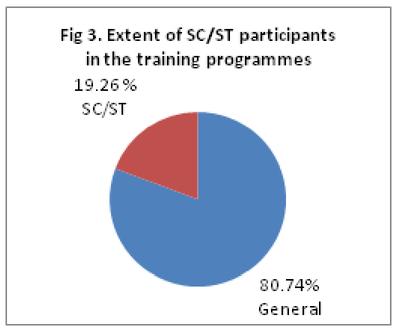
State / UT	Farmers / Farm Women		Rural Youth		Extension Functionary		Sponsored Programmes		Vocational Programmes		Total	
	C	P	C	P	C	P	C	P	C	P	C	P
Goa	100	2176	0	0	5	111	0	0	1	25	**106**	**2312**
Karnataka	1693	55788	157	4796	159	5495	400	16785	50	1238	**2459**	**84102**
Kerala	916	32414	265	7373	99	3213	658	21583	110	2587	**2048**	**67170**
Puducherry	97	2476	12	271	8	203	40	1008	3	51	**160**	**4009**
TamilNadu	3144	111600	371	11963	218	7710	1000	35168	120	3078	**4853**	**169519**
Total	**5950**	**204454**	**805**	**24403**	**489**	**16732**	**2098**	**74544**	**284**	**6979**	**9626**	**327112**

C= No. of Courses P= No. of Participants





The data in Fig 1 reveals that 35 % of the participants were women and the rest were men. Smaller states like Goa and Puducherry had higher percentage of women participation as evident from Fig 2. Extent of SC/ST participants is depicted in Fig 3, which indicates that 19.26 % of the participants were from this category.



Fishermen training at Karaikal, Pondicherry

3.1.3.1 Farmers and Farm women

Training organized for farmers/farm women category covered 18 different training areas listed in Table 2. The major training area was crop production numbering 1335 courses in which 54782 farmers/farm women participated. Training on plant protection (840 courses) and home science (663 courses) were also conducted in large number. Soil health and fertility management was another major area of training with 532 courses and 17203 participants. In horticulture crops, vegetable crop cultivation with 474 courses was the leading training area. Livestock production and management was the next important training area with 463 courses for 16663 farmers. In the home science/women empowerment and medicinal and aromatic plants training courses, women participants outnumbered men (Table 62).

Table 62. Training courses organized for Farmers and Farmwomen

Training Area	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Crop Production	1335	34328	12495	46823	5641	2318	7959	39969	14813	54782
Plant Protection	840	15990	4482	20472	3851	1484	5335	19841	5966	25807
Home Science/ Women empowerment	663	5253	11110	16363	1168	3240	4408	6421	14350	20771
Soil Health and Fertility Management	532	11173	3046	14219	1926	1058	2984	13099	4104	17203
Vegetable Crops cultivation	474	10077	3257	13334	1758	854	2612	11835	4111	15946
Livestock Production and Management	463	8778	3946	12724	2122	1817	3939	10900	5763	16663
Production of Inputs at site	336	5124	3322	8446	1000	780	1780	6124	4102	10226
Agriculture Engineering	269	3889	2085	5974	602	478	1080	4491	2563	7054
Cultivation of fruit crops	245	4995	1432	6427	1005	479	1484	6000	1911	7911
Capacity Building and Group Dynamics	208	3549	2634	6183	656	714	1370	4205	3348	7553
Agro-forestry	190	3198	1451	4649	1125	587	1712	4323	2038	6361
Fisheries	109	1529	1230	2759	308	340	648	1837	1570	3407
Cultivation of Plantation Crops	94	2291	736	3027	414	168	582	2705	904	3609
Cultivation of Ornamental crops	66	1164	458	1622	285	153	438	1449	611	2060

Table 62: ***(Contd...)***

Training Area	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Medicinal and Aromatic Plants	65	1278	993	2271	187	595	782	1465	1588	3053
Cultivation of Spices	28	678	255	933	102	37	139	780	292	1072
Sericulture	24	430	186	616	127	25	152	557	211	768
Tuber crops cultivation	9	94	45	139	23	46	69	117	91	208
GRAND TOTAL	**5950**	**113818**	**53163**	**166981**	**22300**	**15173**	**37473**	**136118**	**68336**	**204454**

Off campus training for farm women at Ramanagara, Karnataka

The state-wise categorization of the above data reveals that out of 5950 courses, 3144 courses were organized in Tamil Nadu, 1693 courses in Karnataka and 916 courses in Kerala (Table 63). Out of the total of 204454 participants, 111600 were Tamil Nadu farmers/farmwomen. As regards the different category of participants, 37473 (18.32%) were from SC/ST category and 68336 (33.42%) were women participants. Details are given in Table 63.

Table 63. State-wise break-up of the training programmes conducted for Farmers and Farmwomen

State/UT	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Goa	100	624	748	1372	268	536	804	892	1284	2176
Karnataka	1693	33268	10077	43345	8638	3805	12443	41906	13882	55788
Kerala	916	16003	11437	27440	2717	2257	4974	18720	13694	32414
Puducher ry	97	1073	1048	2121	173	182	355	1246	1230	2476
Tamil Nadu	3144	62850	29853	92703	10504	8393	18897	73354	38246	111600
TOTAL	**5950**	**113818**	**53163**	**166981**	**22304**	**15173**	**37473**	**136118**	**68336**	**204454**

On campus training programme to rural youth on value addition at Ramanagara, Karnataka

3.1.3.2 Rural Youth

Training courses organized in 28 different training areas for rural youth (805 courses, 24403 participants) are detailed in Table 64. Among these, integrated farming was the major training area with 185 courses (5883 participants) followed by 98 courses on value addition (2810 participants). Entrepreneurship related training areas like mushroom production (71 courses, 2349 participants), vermi-culture (44 courses, 1459 participants) and production of organic inputs (39 courses, 1029 participants) were also the important training areas for rural youth. A further glance at the data indicates that training on value addition, post harvest technology, small scale processing and rural crafts courses attracted more number of women participants than men.

Table 64: Training courses organized for Rural Youth

Training Area	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Integrated farming	185	2663	2131	4794	682	407	1089	3345	2538	5883
Value addition	98	800	1530	2330	151	329	480	951	1859	2810
Mushroom Production	71	1196	839	2035	159	155	314	1355	994	2349
Vermi-culture	44	766	461	1227	140	92	232	906	553	1459
Production of organic inputs	39	498	336	834	124	71	195	622	407	1029
Post Harvest Technology	36	192	506	698	83	187	270	275	693	968
Repair and maintenance of farm machinery and implements	31	600	228	828	129	43	172	729	271	1000
Sheep and goat rearing	26	350	152	502	70	81	151	420	233	653
Poultry production	24	570	103	673	128	49	177	698	152	850
Seed production	24	380	157	537	106	49	155	486	206	692
[illegible]	24	116	441	557	33	113	146	149	554	703

Table 64. Training courses organized for Rural Youth (*Contd...*)

Training Area	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Bee-keeping	23	751	167	918	58	58	116	809	225	1034
Nursery Management of Horticulture crops	23	382	271	653	90	67	157	472	338	810
Planting material production	23	452	134	586	36	31	67	488	165	653
Protected cultivation of vegetable crops	20	284	185	469	90	59	149	374	244	618
Dairying	19	325	77	402	66	65	131	391	142	533
Group dynamics	19	133	206	339	21	59	80	154	265	419
Commercial fruit production	14	144	64	208	43	31	74	187	95	282
Composite fish culture	13	246	84	330	22	9	31	268	93	361
Ornamental fisheries	13	230	103	333	30	19	49	260	122	382
Rural Crafts	8	15	72	87	2	52	54	17	124	141
Training and pruning of orchards	8	111	32	143	35	16	51	146	48	194
Sericulture	6	228	61	289	9	6	15	237	67	304
Fish harvest and processing technology	3	58	27	85	13	7	20	71	34	105
Production of quality animal products	3	15	17	32	0	0	0	15	17	32
Rabbit farming	3	39	14	53	1	1	2	40	15	55
Tailoring and Stitching	3	0	45	45	0	5	5	0	50	50
Quail farming	2	21	6	27	6	1	7	27	7	34
GRAND TOTAL	**805**	**11565**	**8449**	**20014**	**2327**	**2062**	**4389**	**13892**	**10511**	**24403**

Training courses related to rural youth have been further categorized under different states as given in Table 65. KVKs of Kerala conducted more number of courses for rural youth (265 courses, an average of 19 courses each) than Tamil Nadu (371 courses, an average of 13 courses each) and Karnataka (157 courses). It is encouraging to note that more than 43 % (10511 out of 24403) of the participants were women (Table 65).

Table 65: State/Union Territory wise break-up of the training programmes conducted for Rural Youth

State/UT	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	157	2680	1100	3780	668	348	1016	3348	1448	4796
Kerala	265	3239	3023	6262	517	594	1111	3756	3617	7373
Puducherry	12	78	139	217	3	51	54	81	190	271
Tamil Nadu	371	5568	4187	9755	1139	1069	2208	6707	5256	11963
TOTAL	**805**	**11565**	**8449**	**20014**	**2327**	**2062**	**4389**	**13892**	**10511**	**24403**

Training of extension functionaries on ICM in cotton at Davaneger, Karnataka

3.1.3.3 Extension Functionaries

A total of 489 courses were organized for 16732 extension functionaries. Among the different training areas, productivity enhancement in field crops was the major area with 129 courses and 4847 participants. Integrated pest management was the next major training area with 93 courses and 3114 participants. Details of number of courses organized in different training areas along with the number of participants categorized under general, SC/ST, men and women for each of the training areas are given in Table 66:

Table 66. Training courses organized for Extension Functionaries

Training Area	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Productivity enhancement in field crops	129	3297	662	3959	668	220	888	3965	882	4847
Integrated Pest Management	93	2317	439	2756	286	72	358	2603	511	3114
Integrated Nutrient management	45	990	192	1182	272	39	311	1262	231	1493
Livestock feed and fodder production	35	559	253	812	178	82	260	737	335	1072
Rejuvenation of old orchards	27	561	246	807	72	24	96	633	270	903

Table 66. Training courses organized for Extension Functionaries (*Contd…*)

Information networking of farmers	26	426	510	936	40	65	105	466	575	1041
Household food security	24	85	505	590	8	106	114	93	611	704
Post harvest technology and value addition	23	379	207	586	10	33	43	389	240	629
Group Dynamics and farmers organization	22	555	172	727	20	8	28	575	180	755
Production and use of organic inputs	19	385	133	518	73	40	113	458	173	631
Women and Child care	10	0	315	315	2	58	60	2	373	375
Capacity building for ICT application	8	215	48	263	30	15	45	245	63	308
Management in farm animals	8	107	52	159	23	23	46	130	75	205
Care and maintenance of farm machinery and implements	7	175	18	193	27	10	37	202	28	230
Low cost and nutrient efficient diet designing	6	48	115	163	22	53	75	70	168	238
Formation and Management of SHGs	5	34	80	114	4	27	31	38	107	145
Sericulture	2	36	0	36	6	0	6	42	0	42
Total	489	10169	3947	14116	1741	875	2616	11910	4822	16732

Training of Extension functionaries on soil health management at Trichy, Tamil Nadu

Details of training courses organized for extension functionaries have also been elaborated state-wise as given in Table 67. KVKs in Tamil Nadu organized 218 courses with the participation of 7710 extension functionaries. In Karnataka, 159 courses were organized for 5495 extension functionaries, whereas in Kerala 99 courses were organized for 3213 participants.

Table 67. State -wise break-up of the training courses conducted for Extension Functionaries

State/UT	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Goa	5	58	49	107	2	2	4	60	51	111
Karnataka	159	3506	999	4505	677	313	990	4183	1312	5495
Kerala	99	1492	1368	2860	184	169	353	1676	1537	3213
Puducherry	8	93	93	186	1	16	17	94	109	203
Tamil Nadu	218	5020	1438	6458	877	375	1252	5897	1813	7710
TOTAL	**489**	**10169**	**3947**	**14116**	**1741**	**875**	**2616**	**11910**	**4822**	**16732**

Sponsored training programme on ornamental fish production at Calicut, Kerala

3.1.3.4 Sponsored Programmes

Besides the regular training courses, 2098 sponsored ones were conducted by the KVKs in 20 different areas for the benefit of 74544 participants (Table 68). Largest number of training courses (561) were organized on increased production and productivity of crops with the participation of 22872 farmers/rural youth/extension functionaries. Production of inputs at site was the second major area of training under sponsored category with 265 courses and 9845 participants indicating the recognition of importance by different agencies the need of producing inputs on farm. Animal husbandry related training areas like livestock production and management attracted sponsorship for 211 courses involving 10772 participants, followed by animal nutrition management wherein 181 courses were organized for 1105 participants. Training on livestock production management also has the distinction of having highest number of women (8881 out of 10772) participants (Table 68).

Table 68. Sponsored training courses organized during 2013-14

Training Area	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Increased production and productivity of crops	561	15249	4126	19375	2555	942	3497	17804	5068	22872
Production of Inputs at site	265	6045	2586	8631	720	494	1214	6765	3080	9845
livestock production and management	211	1601	1643	3244	290	7238	7528	1891	8881	10772
Animal Nutrition management	181	551	354	905	103	97	200	654	451	1105

Training Area	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Processing and value addition	163	2134	1993	4127	471	423	894	2605	2416	5021
Capacity building and group dynamics	156	3875	1186	5061	542	184	726	4417	1370	5787
Commercial production of vegetables	152	3285	1452	4737	554	263	817	3839	1715	5554
Soil Health and Fertility Management	115	3144	663	3807	577	183	760	3721	846	4567
Farm mechanization tools and implements	94	1355	450	1805	214	70	284	1569	520	2089
Production and value addition in fruits	50	947	332	1279	195	53	248	1142	385	1527
Production and value addition in plantation crops	30	490	159	649	119	30	149	609	189	798
Household nutrition security	29	354	458	812	103	187	290	457	645	1102
Economic empowerment of women	26	228	612	840	60	184	244	288	796	1084
Production and value addition in fruits	18	305	195	500	33	26	59	338	221	559
Animal Disease Management	12	343	225	568	90	77	167	433	302	735
Methods of protective cultivation	11	268	106	374	24	10	34	292	116	408
Production and value addition in ornamental crops	9	72	198	270	10	38	48	82	236	318
Fisheries Management	8	120	51	171	6	28	34	126	79	205
Location specific drudgery reduction technologies	6	45	94	139	9	13	22	54	107	161
Sericulture	1	25	10	35	0	0	0	25	10	35
Total	2098	40436	16893	57329	6675	10540	17215	47111	27433	74544

Sponsored programme on nursery raising at Karur, Tamil Nadu

State-wise break-up of sponsored programmes is provided in Table 69. A total of 1000 courses were organized in Tamil Nadu, followed by 658 in Kerala and 400 in Karnataka. The data also reveals that out of 74544 participants, 17215 represented SC/ST category (23%). Similarly, 36.80 % of the participants (27433 out of 74544) were women. Proportion of women participants was highest in Puducherry (84.82%; 855 out of 1008).

Table 69. State/Union Territory-wise break-up of the Sponsored Programmes

State/UT	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	400	10557	3208	13765	2240	780	3020	12797	3988	16785
Kerala	658	11361	7234	18595	1611	1377	2988	12972	8611	21583
Puducherry	40	148	836	984	5	19	24	153	855	1008
Tamil Nadu	1000	18370	5615	23985	2819	8364	11183	21189	13979	35168
TOTAL	**2098**	**40436**	**16893**	**57329**	**6675**	**10540**	**17215**	**47111**	**27433**	**74544**

Vocational training programme at Chickmagalur, Karnataka for rural youth

3.1.3.5 Vocational Programmes

A total of 284 training courses were organized during the year involving 6979 participants, mostly the rural youth. Among the different vocations, mushroom production was the major area of training with 38 courses and 1068 participants. Value addition was another major area with 33 courses benefiting 896 participants. This area also attracted large number of women (579) compared to other areas. Details are provided in Table 70.

Table 70. Vocational training courses organized during 2013-14

Training Area	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Mushroom Production	38	601	273	874	110	84	194	711	357	1068
Value addition	33	264	476	740	53	103	156	317	579	896
Agril. para-workers, para-vet training	22	147	99	246	23	14	37	170	113	283
production of bio-agents, bio-pesticides, bio- fertilizer etc	20	207	191	398	31	41	72	238	232	470
Capacity Building and Group Dynamics	19	237	143	380	52	64	116	289	207	496
Commercial fruit production	12	173	101	274	32	35	67	205	136	341
Nursery, grafting etc.	11	110	128	238	15	26	41	125	154	279
Integrated crop management	10	187	42	229	42	13	55	229	55	284
Bee-keeping	10	203	74	277	15	12	27	218	86	304
Repair and maintenance of farm implements	10	119	24	143	32	10	42	151	34	185
Tailoring, stitching, embroidery, dying etc.	10	0	127	127	0	66	66	0	193	193
Rural Crafts	9	12	133	145	0	16	16	12	149	161
Seed production	9	149	190	339	30	36	66	179	226	405
Organic farming	8	97	107	204	13	17	30	110	124	234
Sericulture	8	25	13	38	10	1	11	35	14	49
Vermi-compost production	8	105	86	191	21	12	33	126	98	224
Commercial floriculture	6	49	51	100	19	11	30	68	62	130
Poultry farming	5	65	44	109	10	16	26	75	60	135
Sheep and goat rearing	4	36	29	65	2	2	4	38	31	69
Fisheries	1	9	16	25	0	0	0	9	16	25
Rabbit Management	1	15	4	19	9	3	12	24	7	31
Total	**284**	**3197**	**2461**	**5658**	**700**	**621**	**1321**	**3897**	**3082**	**6979**

Vocation training on beekeeping at Salem, Tamil Nadu

Vocational training conducted by the KVKs has also been presented state-wise in Table 71. Large number of vocational course were conducted in Kerala (110 courses by 14 KVKs, an average of 8 per KVK) involving 2587 participants. KVKs in Tamil Nadu conducted 120 courses whereas, KVKs in Karnataka conducted 50 courses. Out of the total of 6979 participants, 44 % were women (3082). Participation of women was the highest in Kerala (51.37 %).

Table 71. State/Union Territory wise break-up of the Vocational training courses

State/UT	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Goa	1	9	16	25	0	0	0	9	16	25
Karnataka	50	691	254	945	198	95	293	889	349	1238
Kerala	110	1104	1139	2243	154	190	344	1258	1329	2587
Puducherry	3	15	13	28	4	19	23	19	32	51
Tamil Nadu	120	1378	1039	2417	344	317	661	1722	1356	3078
TOTAL	**284**	**3197**	**2461**	**5658**	**700**	**621**	**1321**	**3897**	**3082**	**6979**

The summary of state-wise number of training courses under different categories of participants is given in Annexure I and the participation details of these courses based on gender are given in Annexure 2.

Annexure I

State-wise number of training courses organized for different category of participants

Farmers and Farm Women (On+Off)	No. of Courses	Participants (No.)		
		General	SC/ST	Total
Goa	100	1372	804	2176
Karnataka	1693	43345	12443	55788
Kerala	916	27440	4974	32414
Puducherry	97	2121	355	2476
Tamil Nadu	3144	92703	18897	111600
TOTAL	5950	166981	37473	204454
Rural Youth (On+Off)	**No. of Courses**	**General**	**SC/ST**	**Total**
Goa	0	0	0	0
Karnataka	157	3780	1016	4796
Kerala	265	6262	1111	7373
Puducherry	12	217	54	271
Tamil Nadu	371	9755	2208	11963
TOTAL	805	20014	4389	24403
Extension Functionaries (On+Off)	**No. of Courses**	**General**	**SC/ST**	**Total**
Goa	5	107	4	111
Karnataka	159	4505	990	5495
Kerala	99	2860	353	3213
Puducherry	8	186	17	203
Tamil Nadu	218	6458	1252	7710
TOTAL	489	14116	2616	16732
Sponsored Programmes	**No. of Courses**	**General**	**SC/ST**	**Total**
Goa	0	0	0	0
Karnataka	400	13765	3020	16785
Kerala	658	18595	2988	21583
Puducherry	40	984	24	1008
Tamil Nadu	1000	23985	11183	35168
TOTAL	2098	57329	17215	74544
Vocational Programmes	**No. of Courses**	**General**	**SC/ST**	**Total**
Goa	1	25	0	25
Karnataka	50	945	293	1238
Kerala	110	2243	344	2587
Puducherry	3	28	23	51
Tamil Nadu	120	2417	661	3078
TOTAL	284	5658	1321	6979
All Programmes	**No. of Courses**	**General**	**SC/ST**	**Total**
Goa	106	1504	808	2312
Karnataka	2459	66340	17762	84102
Kerala	2048	57400	9770	67170
Puducherry	160	3536	473	4009
Tamil Nadu	4853	135318	34201	169519
GRAND TOTAL	**9626**	**264098**	**63014**	**327112**

Annexure II

State-wise number of training courses and gender representation in different categories of training

	No. of Courses	Participants (No.)		
Farmers and Farm Women (On+Off)		Men	Women	Total
Goa	100	892	1284	2176
Karnataka	1693	41906	13882	55788
Kerala	916	18720	13694	32414
Puducherry	97	1246	1230	2476
Tamil Nadu	3144	73354	38246	111600
TOTAL	5950	136118	68336	204454
Rural Youth (On+Off)	**No. of Courses**	**Men**	**Women**	**Total**
Goa	0	0	0	0
Karnataka	157	3348	1448	4796
Kerala	265	3756	3617	7373
Puducherry	12	81	190	271
Tamil Nadu	371	6707	5256	11963
TOTAL	805	13892	10511	24403
Extension Functionaries (On+Off)	**No. of Courses**	**Men**	**Women**	**Total**
Goa	5	60	51	111
Karnataka	159	4183	1312	5495
Kerala	99	1676	1537	3213
Puducherry	8	94	109	203
Tamil Nadu	218	5897	1813	7710
TOTAL	489	11910	4822	16732
Sponsored Programmes	**No. of Courses**	**Men**	**Women**	**Total**
Goa	0	0	0	0
Karnataka	400	12797	3988	16785
Kerala	658	12972	8611	21583
Puducherry	40	153	855	1008
Tamil Nadu	1000	21189	13979	35168
TOTAL	2098	47111	27433	74544
Vocational Programmes	**No. of Courses**	**Men**	**Women**	**Total**
Goa	1	9	16	25
Karnataka	50	889	349	1238
Kerala	110	1258	1329	2587
Puducherry	3	19	32	51
Tamil Nadu	120	1722	1356	3078
TOTAL	284	3897	3082	6979
All Programmes	**No. of Courses**	**Men**	**Women**	**Total**
Goa	106	961	1351	2312
Karnataka	2459	63123	20979	84102
Kerala	2048	38382	28788	67170
Puducherry	160	1593	2416	4009
Tamil Nadu	4853	108869	60650	169519
GRAND TOTAL	**9626**	**212928**	**114184**	**327112**

3.1.4 Frontline extension programmes

KVKs are carrying out various extension activities by adopting individual, group and mass contact methods to accelerate the process of technology adoption by farmers. Further, KVKs are in the forefront for mass media utilization in disseminating timely and relevant technologies to the farming community without much time lag. During the year, the various extension programmes carried out by KVKs in coordination and collaboration with other line departments/ agencies working in the district are briefly presented hereunder.

A total of 147157 extension programmes were organized through different methods and means wherein technologies related to agriculture and allied sectors were appraised among 38.53 lakh farmers and 2.07 lakh extension personnel in order to disseminate those technologies on a large scale. Data further indicated that KVKs in Karnataka organized maximum extension programmes (61440) followed by Tamil Nadu (47555), Kerala (35491), Puducherry (1395), Goa (1222) and Lakshadweep (54) with 41.75%, 32.31%, 24.11%, 0.95%, 0.83% and 0.05%, respectively (Table 72 and Fig.4).

Table 72: Statewise frontline extension programmes organized and number of participants

State	No. of programmes	No. of farmers			No. of extension personnel		
		Men	Women	Total	Men	Women	Total
Karnataka	61440	1942622	597513	2540135	85587	41173	126760
Tamil Nadu	47555	245526	104839	350365	11931	5975	17906
Kerala	35491	503448	415459	918907	26884	34070	60954
Goa	1222	20356	13724	34080	336	450	786
Puducherry	1395	6053	3339	9392	436	85	521
Lakshadweep	54	418	173	591	37	10	47
Total	147157	2718423	1135047	3853470	125211	81763	206974

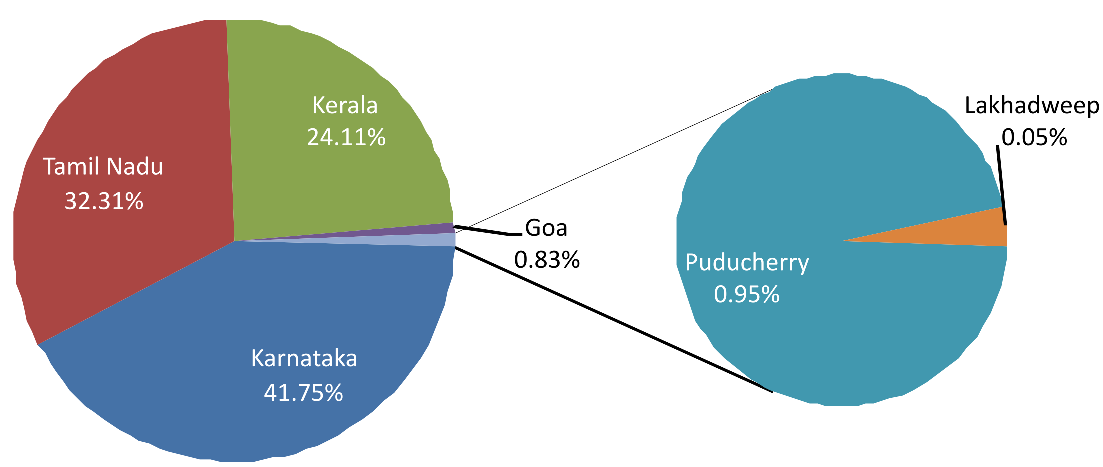


Fig.4 : Statewise per cent of frontline extension programmes organised

Details of activitywise extension programmes organized are furnished in Table 73. Data implies that KVKs made more efforts on advisory services (65195), farmers visit to KVK (57674), scientists visit to farmers fields (8347), diagnostic visits (3821), Lectures delivered as resource persons (2584), method demonstrations (1474) and had interactions with 38.53 lakh thousand farmers and 2.07 lakh extension personnel. Further, it is note worthy that KVKs have organized/took part in 470 exhibitions and 156 Kisan Melas wherein 19.63 lakh and 12.61 lakh farmers and 0.74 lakh and 0.94 lakh extension personnel, respectively participated.

KVKs organized a total of 1.45 lakh extension programmes and created awareness among 38.53 lakh farmers and 2.07 lakh extension personnel and public on various aspects viz., varietal performance, production technologies, Integrated Pest and Disease Management, animal health and nutrition, production technologies of poultry, fisheries and human nutrition.

Table 73 : Activitywise extension programmes organized and number of participants

Programmes	No. of program -mmes	No. of farmers			No. of extension personnel		
		Men	Women	Total	Men	Women	Total
Advisory Services	65195	64971	17432	82403	3079	1537	4616
Animal Health Camps	369	7216	3261	10477	276	152	428
Celebration of important days	641	56780	25949	82729	1362	604	1966
Daignostic visits	3821	10533	3919	14452	971	625	1596
Exhibitions	470	1338242	625642	1963884	35404	38314	73718
Exposure visists	785	16320	5194	21514	685	258	943
Ex-trainees Sammelan	33	1036	596	1632	22	16	38
Farm science club conveners meets	96	1906	812	2718	84	27	111
Farmers seminars	213	15535	6514	22049	996	518	1514
Farmers visit to KVK	57674	62583	20844	83427	2881	1525	4406
Field Days	659	19125	5917	25042	872	430	1302
Film Shows	764	16463	5999	22462	1352	414	1766
Group discusion meetings	817	13576	6558	20134	811	288	1099
Kisan Ghosthies	114	3271	1543	4814	267	274	541
Kisan Mealas	156	933379	328074	1261453	62733	30918	93651
Lectures delivered as resource persons	2584	79092	39538	118630	6470	2326	8796
Mahila mandal convenors meetings	9	0	164	164	0	14	14
Method Demonstartions	1474	24019	10767	34786	1270	442	1712
Others	2115	25363	11879	37242	1754	1253	3007
Scientists visit to farmers fields	8347	19667	5538	25205	1376	684	2060

Table 73 : (Contd...)

Programmes	No. of program -mmes	No. of farmers			No. of extension personnel		
		Men	Women	Total	Men	Women	Total
SHG Conveners meets	275	1155	4830	5985	349	413	762
Soil health camps	155	2274	791	3065	191	121	312
Soil test campaigns	59	2421	1786	4207	166	64	230
Workshops	332	3496	1500	4996	1840	546	2386
Total	147157	2718423	1135047	3853470	125211	81763	206974

KVKs disseminated technologies through extension literature (5593), newspaper coverage (2461), popular articles (619), radio talks (578) and T V talks (467). Statewise details are presented in Table 74. Further, KVKs developed 242 video CDs/DVDs on various technologies and made them available for sale to farmers and other stakeholders.

Table 74 : Statewise extension programmes organized for mass contact

Activity	No. of programmes						Total
	Karnataka	Taml Nadu	Kerala	Goa	Puducherry	Lakshadweep	
Electronic Media (CD./DVD)	17	133	12	80	0	0	242
Extension literature	2350	2930	275	11	22	5	5593
Newspaper coverage	1047	884	492	16	22	0	2461
Popular articles	250	260	107	0	2	0	619
Radio talks	242	277	50	1	8	0	578
TV talks	126	287	38	0	16	0	467

Goats being treated in animal health camp (KVK Karur)

Field visit by multidisciplinary team (KVK, Thiruvarur)

Exhibition (KVK, Kasaragod)

Field day (KVK, Shimoga)

Farmer-scientist interaction (KVK, Alleppey)

Cows being treated in animal health camp (KVK, Pathanamthitta)

3.1.5 Technology week

KVKs observe technology week for 4-6 days to create awareness among farmers and other stakeholders about the latest technologies in agriculture and its allied sectors. Besides, it also provides a forum to discuss the latest issues, problems and strategies for arriving at probable solutions. The major technical agenda include guest lectures, visit to demonstration units/plots inside the KVK campus, exhibition on latest technologies, film shows, group discussions etc.

During the period under report, 38 KVKs of the Zone; *viz.,* 18 in Karnataka, 12 in Kerala, 07 in Tamil Nadu and 01 in Goa organized technology week, in which a total of 285409 farmers and 617 officials participated. These programmes were organized in convergence with 555 agencies. The technical programmes during the technology week included besides visit to demonstrations inside the KVKs, 29 kisan gosthies, 316 guest lecturers from eminent scientists and officials from development departments, 25 exhibitions with several stalls in each exhibition depicting posters and live specimen on latest technologies, 78 film shows, 40 visit to farms and 50 diagnostic practicals. In addition, 207 literature materials, 7.5 t seeds of hgh yielding varieties / hybrid seeds, 1.52 lakh planting materials, 4.5 t of bio-products, 0.24 t of bio-fertilizers and 5000 livestock were made available for sale to farmers.

3.1.6 Kisan mobile advisory services

Kisan mobile advisory service is an attempt to provide requisite advisories and need based information at the right time to the right people. KVKs are sending information through text or voice mails to registered farmers advising them on the vital issues of agricultural importance. During the reporting period 7,794 text messages, 855 voice messages and 1,763 text and voice messages were sent to farmers. Among these communications major share was of crops (4,520) followed by awareness (1,829), weather (1,777), marketing (846), livestock (804) and other enterprises(636). The details are presented in Table 75.

Table 75: State-wise SMS/Voice mails sent under different areas

Name of State	No of KVKs	Message Type	Crop	Lives -tock	Weathee	Marketing	Awareness	Other enterprise	Total
Karnataka	24	Text only	1025	130	79	119	247	110	**1710**
	10	Voice only	232	34	7	0	24	26	**323**
	8	Voice & Text	562	101	40	80	76	78	**937**
	KARNATAKA TOTAL		**1819**	**265**	**126**	**199**	**347**	**214**	**2970**
Tamil Nadu	28	Text only	1571	449	1600	626	1114	394	**5754**
	5	Voice only	109	60	40	3	315	5	**532**
	2	Voice & Text	692	0	0	11	7	0	**710**
	TAMILNADU TOTAL		**2372**	**509**	**1640**	**640**	**1436**	**399**	**6996**
Kerala	**5**	**Text only**	265	18	1	3	27	0	**314**
	2	Voice only	60	12	10	4	8	22	**116**
	KERALA TOTAL		**325**	**30**	**11**	**7**	**35**	**22**	**430**
Goa	**1**	**Text only**	**4**	**0**	**0**	**0**	**11**	**1**	**16**
TOTAL	**58**	**Text only**	2865	597	1680	748	1399	505	7794
	17	**Voice only**	341	94	47	3	339	31	855
	12	**Voice & Text**	1314	113	50	95	91	100	1763
	ZONAL TOTAL		**4520**	**804**	**1777**	**846**	**1829**	**636**	**10412**

3.1.7 E-Connectivity

During the XI Plan Period, ICAR aimed for improving Information and Communication in KVK system, provided e-linkage to its network of KVKs and Zonal Project Directorates. Under the e-connectivity project, E-Linkage was established in 37 KVKs along with Zonal Project Directorate, Bangalore with technical guidance and execution by ERNET India. State-wise list of KVKs provided with e-linkage is given in Table 76. These KVKs were connected electronically through VSAT and to the Hub established at New Delhi. The communication between KVKs across the country through IP phones was enabled by providing IP phone numbers. KVK staffs were regularly apprised of the latest technologies through guest lectures by eminent scientists in the respective fields and other communications through e-connectivity/video conferencing.

Using these facility 16 e-seminars were webcasted from KVK hub New Delhi involving experts in the field covering various topics of interest to KVKs during the year.

Table 76: KVKs with e-linkage facility

States	No. of KVKs	Districts
Karnataka	11	Raichur, Bidar, Gulbarga, Haveri, Hassan, Mandya, Chitradurga, Chickmagalur, Mysore, Belgaum, Gadag
Tamil Nadu	14	Salem, Cuddalore, Trichy, Pudukottai, Vellore, Ramanathapuram, Madurai, Kancheepuram, Dindigul, Nilgiris, Thiruvannamalai, Erode,Tuticorin, Karur
Kerala	10	Palghat, Kollam, Wyanad, Kannur, Malappuram, Thrissur, Kasaragod, Calicut, Trivandrum, Pathanamthitta
Goa	1	North Goa
Puducherry	1	Puducherry

3.1.8 Production of technology inputs

To achieve the potential yield in agriculture and allied sectors, timely availability of good quality seeds, planting materials, livestock breeds and bio-products are the primary requirement. In this direction, KVKs are actively involved in production of quality seeds, planting materials, livestock, bio-products and supplying them to the needy farmers.

Quality technological products

During the year, KVKs of Zone VIII produced and supplied 638 t of seeds of different crop varieties and hybrids, 60 lakh planting materials of different crops and hybrids, 303 t of bio-products and 1.7 lakh of livestock strains and fish fingerlings benefiting 4.2 lakh farmers.

During the period under report, KVKs produced 638 t seeds of crop varieties, 303 t bio-products, 47 lakh number of planting materials of varieties, 13 lakh number of planting materials of hybrids and 1.7 lakh number livestock and fisheries and supplied to 2 lakh, 0.7 lakh, 1 lakh, 0.3 lakh, 0.1 lakh farmers, respectively (Table 77).

Table 77 : Production and supply of technological inputs

Category	Quantity	Value (Rs.in lakh)	Farmers (No. in lakh)
Seeds of crop varieties (q)	6375.72	249.78	2.08
Bio-products (q)	3028.57	130.68	0.69
Planting materials of crops (No. in lakh)	46.88	183.55	1.03
Planting materials of crop hybrids (No. in lakh)	12.93	10.24	0.27
Livestock and fisheries (No. in lakh)	1.68	85.54	0.09

3.1.8.1 Seeds

Statewise details pertaining to seed production by KVKs of Zone VIII is presented in Table 78. Data indicates that KVKs in Karnataka produced the highest quantity of seeds (3454.88 q) followed by KVKs of Tamil Nadu (1772.74 q), Puducherry (894.33 q), Kerala (159.38 q), Goa (94.34 q). Data in Table 79 shows that more quantity of seed was produced on cereals (4645.63 q) followed by pulses (488.43 q), fodder (384.51q), Millets (279.17q), oilseeds (278.8q), commercial (125.00), vegetables (77.69q), spices (58.91q), tuber (17.84 q), fibre (10.95 q) and flowers (8.79 q).

Table 78: Statewise production and supply of seeds and planting materials by KVKs

State	Seeds			Planting materials		
	Quantity (q)	Value (Rs.)	Farmers (No.)	Quantity (No.)	Value (Rs.)	Farmers (No.)
Karnataka	3454.88	11523868	20134	1426020	6454642	18275
Tamil Nadu	1772.74	6670439	37413	2256414	5015041	21153
Kerala	159.38	4262052	150093	554322	5082685	54496
Goa	94.34	208710	328	37070	515585	2274
Puducherry	894.33	2312346	315	412760	1282344	5185
Lakshadweep	0.05	192	5	1594	4975	1170
Total	6375.72	24977607	208288	4688180	18355272	102553

Table 79 : Crop categorywise production of seeds

Crop category	Seed production		
	Quantity (q)	Value (Rs.)	Farmers (No.)
Cereals	4645.63	10538246	9651
Commercial	125.00	31250	58
Fibers	10.95	64050	106
Flowers	8.79	52748	248
Fodders	384.51	2672905	29186
Millets	279.17	1010223	4947
Oilseeds	278.80	2111638	2692
Pulses	488.43	3022302	6178
Spices	58.91	197906	1702
Tubers	17.84	45136	181
Vegetables	77.69	5231203	153339
Grand Total	6375.72	24977607	208288

3.1.8.2 Planting materials

Statewise details pertaining to production of planting materials by KVKs of Zone VIII is presented in Table 78. Data indicates that KVKs in in Tamil Nadu produced the highest number of planting material (2256414) of crops followed by KVKs in Karnataka (1426020), Kerala (554322), Puducherry (412760), Goa (37070) and Lakshadweep (1594). Data in Table 80 shows that the maximum quantity of planting material was fodder slips (2827324) and the rest was seedlings of vegetables (885113), fruit crops (285199), plantations (195444), pulses (148996), spices (104253), flowers (103504), ornamentals (62465), forest species (54662), commercial (16580), tubers (2500), and medicinal and aromatics (2140).

Table 80: Crop categorywise production of planting materials

Crop category	Planting materials		
	Quantity (No.)	Value (Rs.)	Farmers (No.)
Commercial crops	16580	39460	102
Flowers seedlings	103504	290056	1082
Fodder sets	2827324	1877873	6850
Forest species	54662	584394	5604
Fruits plants	285199	7374908	22491
Medicinal and aromatics plants	2140	25965	283
Ornamental plants	62465	911211	8502
Plantations plants	195444	3879625	11056
Pulses seedlings	148996	210738	1587
Spices plants	104253	1160460	19537
Tubers	2500	5000	156
Vegetables	885113	1995582	25303
Total	4688180	18355272	102553

3.1.8.3 Hybrid planting material

Statewise details pertaining to production of planting materials of hybrids by KVKs of Zone VIII is presented in Table 81. Data indicates that KVKs in Puducherry produced highest number of hybrid planting materials (654542) followed by KVKs in Kerala (251556), Karnataka (237227), Tamil Nadu (146283) and Goa (3000). In the case of crops, more number of hybrid seedlings of chilli green (407311) were produced followed by marigold (355642), cabbage (132355), cauliflower (119495), tomato (113678), watermelon (95083), brinjal (62478), ridge gourd (5292), and snake gourd (1274) (Table 82).

Table 81: Statewise production of planting materials of hybrids

State	Planting materials of hybrids		
	Quantity (No.)	Value (Rs.)	Farmers (No.)
Karnataka	237227	145898	220
Tamil Nadu	146283	191712	285
Kerala	251556	516591	25813
Goa	3000	6000	16
Puducherry	654542	163636	371
	1292608	1023837	26705

Table 82 : Crop categorywise production of planting materials of hybrids

Crop category	Planting materials of hybrids		
	Quantity (No.)	Value (Rs.)	Farmers (No.)
Brinjal	62478	46124	152
Cabbage	132355	273388	13271
Cauliflower	119495	243497	12543
Chilli green	407311	268115	300
Marigold	355642	88911	205
Ridge gourd	5292	1323	9
Snake gourd	1274	319	5
Tomato	113678	63599	165
Watermelon	95083	38561	55
Total	1292608	1023837	26705

3.1.8.4 Bio-products

Statewise details pertaining to production of bio products by KVKs of Zone VIII is presented in Table 83. Data indicates that during the year KVKs in Kerala produced largest quantity of bio products (1618.34 q) followed by KVKs in Tamil Nadu (667.67 q), Karnataka (432.39 q), Puducherry (215.92 q), Goa (81.77 q), and Lakshadweep (12.47 q). Data regarding categorywise production of bio products is presented in Table 84. Of total production, largest quantity (882.63 q) of vermicompost followed by bio fungicides (852.08 q), bio pesticides (812.90), micro nutrient mixtures (233.64 q), mushroom spawn (117.04 q), bio agents (82.62 q) and bio-fertilizers (47.65 q) were produced. Further, KVKs produced 70600 number of Acerophagus papaya parasitoids, 22550 EPN, 16531 pheromone traps and 1382 Trico cards (Table 85).

Table 83: State wise production of bio products

State	Quantity (q)	Bio products Value (Rs.)	Farmers (No.)
Karnataka	432.39	3509775	9065
Tamil Nadu	667.67	1778302	6072
Kerala	1618.34	6380938	46599
Goa	81.77	111290	98
Puducherry	215.92	1282144	6551
Lakshadweep	12.47	5330	1051
Total	3028.56	13067779	69436

Table 84: Category wise production of Bio products

Category	Quantity (q)	Bio products Value (Rs.)	Farmers (No.)
Bio agents	82.62	344555	1233
Bio fertilizers	47.65	214781	4226
Bio fungicides	852.08	5696540	34656
Bio pesticides	812.90	2066655	17041
Micro nutreint mixtures	233.64	3373031	6328
Mushroom spawn	117.04	719722	2360
Vermi compost	882.63	652495	3592
Total	3028.56	13067779	69436

Table 85 : Production of other bio products

Category	Quantity (No.)	Bio products Value (Rs.)	Farmers (No.)
Acerophagus papayae	70600	Free	347
EPN	22550	33825	56
Pheromone traps	16531	1218235	5762
Trico cards	1382	34550	260
Total	111063	1286610	6425

Bio products

KVKs produced and supplied 303 t of bio products, 70600 number of Acerophagus papayae, 22550 EPN, 16531 pheromone traps and 1382 Trico cards through which nearly 80000 farmers were motivated to adopt bio-control by reducing use of chemicals.

3.1.8.5 Livestock and fisheries

Statewise details pertaining to production of livestock and fisheries by KVKs of Zone VIII is presented in Table 86. Data indicates that KVKs in Puducherry produced largest quantity of livestock materials and fisheries (72512 numbers) followed by Kerala (37081), Tamil Nadu (33912), Goa (14575) and Karnataka (9830). Of total production, maximum (96948) was under fisheries followed by poultry (48423), poultry-egg(21436), goat and sheep (697), rabbitary (159), piggery (196), dairy animals (43) and dairy animals-calf(8)(Table 87).

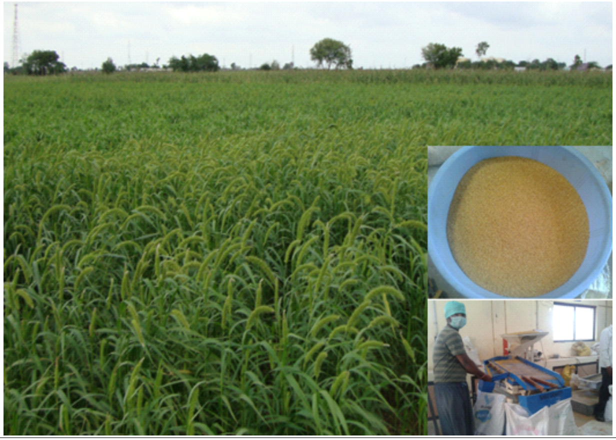
Table 86: Statewise production of livestock materials and fisheries

State	Livestock materials and fisheries Quantity (No.)	Value (Rs.)	Farmers (No.)
Karnataka	9830	1964670	1478
Tamil Nadu	33912	3335292	1515
Kerala	37081	2827518	4434
Goa	14575	208146	1491
Puducherry	72512	218639	155
Total	167910	8554265	9073

Table 87: Categorywise production of livestock materials and fisheries

Category	Livestock materials and fisheries Quantity (No.)	Value (Rs.)	Farmers (No.)
Dairy animals	43	424254	66
Dairy animals (calf)	8	63250	8
Fisheries	96948	208578	863
Goat and sheep	697	2742830	457
Piggery	196	591425	99
Poultry	48423	4292728	5832
Poultry (egg)	21436	175735	1672
Rabbitary	159	55465	76
Total	167910	8554265	9073

Production of piglets (KVK, Namakkal)



Production of foxtail millet seed (KVK, Raichur)


Mango nursery (KVK, Dharmapuri)


Annual moringa seedlings (KVK, Kasaragod)


Jamun grafts (KVK, Bangalore Rural)


Vanaraja poultry (KVK, North Goa)

KVKs in Karnataka

Seeds: Produced 345 t of seeds of different crops, of which, paddy seeds ranked first with 236 t and sold to 3976 farmers followed by 19 t seeds of bengalgram (1696 farmers), 19 t seeds of soybean (2228 farmers), 13 t seeds of pigeonpea (2409 farmers), 11 t seeds of finger millet (1605 farmers).

Planting materials: Produced a total number of 14 lakh seedlings, of which, hybrid napier occupied first rank with 7 lakh seed sets and sold to 3719 farmers followed by 1.5 lakh seedlings of pigeonpea (1572 farmers), 75000 seedlings of tuberose (250 farmers), 74000 seedlings of drumstick (2033 farmers) and 72000 seedlings of arecanut (681 farmers).

KVKs in Tamil Nadu

Seeds: Produced 173 t of seeds of different crops, of which, paddy seeds occupied first place with 108 t and sold to 2956 farmers followed by 24 t seeds of fodder sorghum (22750 farmers),12 t sets of sugarcane (58 farmers), 7 t seeds of maize (94 farmers), 5 t seeds of blakgram (343 farmers).

Planting materials: Produced a total number of 22.56 lakh, of which, hybrid napier occupied first place with 19 lakh seed sets and sold to 1354 farmers followed by 43000 seedlings of chilli green (85 farmers), 36000 grafts of mango (72 farmers), 23000 suckers of (72 farmers) and 26000 seedlings of tomato (289 farmers).

KVKs in Kerala

Seeds: Produced 16 t of seeds of different crops, of which, paddy seeds ranked first with 10 t and sold to 921 farmers followed by 1t seeds of turmeric (921 farmers), 1 t seed tubers of Amorphophallus (29 farmers), 0.7 t seeds of cowpea (28046 farmers), 0.7 t seeds of ashgourd (7799 farmers).

Planting materials: Produced a total number of 5 lakh seedlings, of which, chilli green occupied first rank with 64000 seedlings and sold to 3138 farmers followed by 56000 rooted cuttings of blackpepper (4874 farmers), 53000 seedlings of brinjal (2350 farmers), 50000 seedlings of tomato (2862 farmers), 45000 seed sets of hybrid napier (1430 farmers).

KVKs in Goa,

Produced 9.4 t of seeds of different crops, of which, maximum were paddy seeds (9 t) and sold to 250 farmers. Further, produced a total number of 37000 seedlings, of which, onion occupied first rank with 6000 seedlings and sold to 17 farmers followed by 6000 seedlings of duranta (458 farmers), 5000 seedlings of coocnut (477 farmers), 5000 seedlings of chilli green (21 farmers), 3000 grafts of mango (200 farmers).

KVKs in Puducherry

Produced 89 t of seeds and 12 lakh seedlings of different crops. With regard to seeds production, maximum production occupied by paddy seeds (88 t) and sold to 222 farmers and also one society (PASIC), Puducherry. In case of planting materials, brinjal occupied first place with 2 lakh seedlings production and sold to 190 farmers followed by 45000 suckers of banana (1976 farmers), 36000 seedlings of ashgourd (26 farmers), 33000 seedlings of muskmelon (12 farmers), 9000 seedlings of teak (125 farmers).

KVK in Lakshadweep

Produced 0.005 t seeds of amaranthus (0.003 t) and ashgourd (0.002 t) and provided to 5 farmers. Regarding planting materials, 1594 seedlings of different crops were produced, of which, 628 seedlings are tomato, 579 chilli green, 200 coconut and 187 brinjal and provided to 523, 440, 20 and 187 farmers, respectively.

3.1.9 Soil, water and plant analysis

A total of 67 KVKs have established soil, water and plant analyzing laboratory and are carrying out the analysis of soil, water and plant samples for the benefit of farming community. Further, KVKs are also utilizing this facility for carrying out the soil test based nutrient recommendation for conducting FLDs and OFTs as well rendering advisory services on nutrient based recommendations to the farmers. During the year, a total of 48199 samples of soil, water, plant, manure, lime etc received from 39448 farmers belonging to 13438 villages were analyzed with realization of Rs. 33.70 lakh (Table 88). State-wise data showed that KVKs in Karnataka analyzed samples (34244) followed by Tamil Nadu (7913), Kerala (5549), Goa (273) and Puducherry (220) (Table 89).

Table 88: Details of Samples analyzed during 2013-14

Type of sample	No. of samples	No. of Farmers	No. of villages	Amount realized (Rs.)
Soil samples	33073	26196	7584	2524329
Water samples	14462	13020	5760	811415
Plant samples	543	177	56	22000
Manure samples	74	25	14	10310
Lime samples	47	30	24	2820
Total	**48199**	**39448**	**13438**	**3370874**

Table 89: State-wise soil, water, plant analysis undertaken during 2013-14

Type of sample	No. of samples	No. of farmers	No. of villages	Amount realized (Rs.)
Kerala	5549	4653	262	691770
Karnataka	34244	29457	10984	2409456
Tamil Nadu	7913	4926	2128	199024
Puducherry	220	139	52	32950
Goa	273	273	12	37674
Total	**48199**	**39448**	**13438**	**3370874**

3.1.10 Rain water harvesting units

Rainwater harvesting units with micro irrigation system were established in 16 KVKs. A total of 74 training courses and 57 demonstrations were conducted whereas 1.7 lakh planting materials were produced utilizing this facility. Further, 34181 farmers and 869 officials visited these units and got acquainted with the rainwater harvesting techniques.

3.1.11 Convergence and linkage

Krishi Vigyan Kendras had linkage with different categories of organizations while carrying out their mandated activities (listed below). Name of agencies/institutions under each category of organizations is given in Table 90. Among different organizations, the exact nature of activities conducted in collaboration with ATMA, under NHM, and RKVY; and with externally funded agencies are given in the ensuing paragraphs.

Table 90. Linkage of KVKs with Organization/Institution.

Sl. No.	Categories	Institutions, Organizations, Agencies
1	District and Local Administration	Office of Collector / Commissioner, Zilla Panchayat, Taluk Panchayat, Gram Panchayat
2	State Agricultural Universities	Research Stations, Colleges, different Departments in these colleges, Farmers Training Institutes/Centres, AICRPs, ATICs,
3	Banking Institutions	NABARD, Lead Banks, Nationalized banks, Rural Banks, District Cooperative Banks,
4	Commodity Boards	Coffee, Tea, Rubber, Spice
5	Development Boards	Coconut, Horticulture, Dairy, Livestock, State Planning Boards, Khadi & Village Industries Board, National Fisheries Development Board, National Medicinal Plants Board, Sheep and Wool Development Board
6	Cooperatives	Aavin, CODISSIA, Co-operative Agri. Bank, Cooperative Societies, Milk Producers Cooperative, IFFCO, Institute of Co – operative Management, PAPSCO, Agricultural Produce Co-operative Marketing Society
7	Federations	Milk Federation, Marketing Federation, Oil Seeds Federation, Milk Marketing Federations, TANFED,
8	Corporations	Plantation Corporation, Seed Corporation, Agro Industries Corporation Ltd , Kerala Coastal Aquaculture development corporation, State Development Corporation for SC/ST development, State Poultry Development Corporation, TamilNadu Women Development Corporation, Vegetable and fruit promotion Council (VFPCK), Women Development Corporation, Central Warehousing Corporation, Cotton Corporation of India, Pondicherry Agro Service Industrial Corporation (PASIC)
9	Research Institutes (other than ICAR)	CFTRI, CSB-NSSP, CSR&TI, DFRL, Centre for Water Resources Development and Management, Institute of Forest Genetics and Tree Breeding

Table 90. Linkage of KVKs with Organization/Institution. (*Contd.*.)

Sl. No.	Categories	Institutions, Organizations, Agencies
11	Central Schemes	PPV FRA, NREGS, National Literacy Mission, National Seed Project, Integrated Child Development Scheme(ICDS)
12	Educational Institutions	IGNOU, Annamalai University, Avinashilingam University, Central University of Tamil Nadu, Community Polytechnic Scheme,
13	Groups and Associations	Fertilizer Association of India, Floriculturists Association of Nilgiris, Nilgiri Adivasi Welfare Association (NAWA), Mahalir Thittam, youth clubs, Mahila Mandals, Nilgiri Bought Leaf Factory Association, Nilgiris Small Tea Growers' Association, Women's Welfare Association,
14	ICAR Institutes	National Bureau of Agriculturally Important Insects (NBAII), Indian Institute of Horticulture Research, Central Institute for Cotton Research, Central Institute of Agriculture Engineering, Central Institute of Fresh Water Aquaculture, Central Plantation Crop Research institute, Central Institute of Brackish water Aquaculture, Central potato research station, Central Soil & Water Conservation Research & Training Institute, Central Research Institute for Dryland Agriculture, Directorate of Rice Research, Directorate of Oilseeds Research, Indian Institute of Spices Research, National Academy of Agricultural Research Management (NAARM), National Bureau of Soil Survey and Land Use Planning, National Institute of Animal Nutrition and Physiology, National Pulse Research Centre, National Research centre for Banana, National Centre for Integrated Pest Management, Sugarcane Breeding Institute, National Research centre for Cashew, Indian Veterinary Research Institute,
15	Development Departments	Agriculture Department, Agribusiness and Marketing Department, Animal Husbandry Department, Child and Women Department, Command Area Development Authority, Department of Agricultural Engineering, Department of Horticulture, Department of Sericulture, Department of women and child welfare, Department of Agricultural Marketing , Department of Agricultural Marketing and Agri Business Development, Department of Animal Husbandry and Fisheries, Department of Fisheries, Department of Agrl. Marketing, Dairy extension Department, Department of Forestry, Department of Seed Certification, Department of Social Welfare, Department of Water Resources, Department of Watershed, Dept. of Industries and commerce, Dept. of Information & publicity, Dept. of Soil Conservation, Department of Panchayath raj and rural development, District Rural Development Agency, District Water shed Development Agency,
16	Media Agencies	All India Radio, Doordarshan & Private TV Channels , District Information centre, Farm Information Bureau, Information and Broadcasting Dept., News papers, Press Information Bureau,
17	Non-Governement Organizations	AME, BAIF, BASIX, DHAN Foundation, MSSRF, NHRDF, Rural Development and Self- Employment Training Institute (RUDSET), Shree Kshetra Dharmasthala Rural Development Project, (SKDRDP), Vijaya Rural Developmental Foundation, SEWA,
18	Private Companies	Dhanuka Agritech Ltd, EID Parry Sugar factory, FACT, Jain Irrigation Systems Ltd., Mangalore Chemical and Fertilizers, National Co-operative Sugar Factory, SPIC, UPL, Zuari Agro chemicals, Karnataka Antibiotics and Pharmaceutical Ltd.,

3.1.11.1 Linkage with Agriculture Technology Management Agency (ATMA):

KVKs worked in close collaboration with ATMA in most of the districts of the Zone. Different types of activities carried out in collaboration with ATMA are given in Table 91. Altogether, KVKs participated in 2052 programmes of ATMA during the year. At the same time KVKs organized 628 programmes in collaboration with ATMA. In order to conduct these programmes, KVKs received Rs.66.29 lakh from ATMA. Among the programmes attended by the KVKs, the major activity area was training, in which 713 programmes were attended by the KVK staff. KVKs themselves organized 217 training programmes in collaboration with ATMA. Participation in meetings related to ATMA or conducted by ATMA were participated on 492 occasions, whereas KVKs organized 101 meetings involving ATMA. Conducting of demonstrations, exposure visits and exhibitions were the other major activities conducted in collaboration with ATMA (Table 91).

Table 91: Details of activities conducted/participated by KVKs in collaboration with ATMA

Sl.No.	Activities	Programmes attended by KVK staff (No.)	Programmes Organized by KVKs (No.)
1	Training programmes	713	217
2	Meetings	492	101
3	Demonstrations	203	100
4	Exposure visits	148	53
5	Exhibitions	86	23
6	Extension Literature	83	22
7	Kisan Mela	43	12
8	Technology Week	43	27
9	Farmers Field Schools	41	14
10	Farm Schools	39	4
11	On Farm Testing	31	28
12	Soil health camps	29	7
13	Seminar	17	0
14	Field days	16	3
15	Animal Health Campaigns	15	10
16	Joint Visits	15	0
17	Monthly Technological Advice	14	0
18	Workshop	14	2
19	Interface meetings	6	4
20	Kisan Goshti	4	1
	Total	**2052**	**628**

3.1.11.2 Activities carried out under National/State Horticulture Mission (NHM/SHM):

KVKs were instrumental in establishing the following facilities under NHM/SHM

a) Small scale nurseries/model nurseries for producing quality planting material at 10 KVKs with a financial assistance of Rs.115.19 lakh.

b) Tissue culture laboratory, mushroom production unit and bio-control laboratory in three KVKs with a total financial assistance of Rs.46.50 lakh.

c) Besides, these KVKs conducted special courses for gardeners with a amount of Rs 17 lakh. Many other training courses, seminars and extension activities were also carried out with a financial assistance of Rs. 4.5 lakh.

3.1.11.3 Activities carried out under Rashtriya Krishi Vikas Yojana (RKVY):

As many as 24 KVKs were provided with financial assistance to the tune of Rs.662.59 lakh under RKVY for various activities as detailed below:

a) Demonstration of improved production technologies, precision farming, SSI etc.

b) Demonstration of integrated farming system.

c) Entrepreneurship development programmes.

d) Organization of mass extension programmes like Kisan mela, Expo, exhibitions etc.

e) Establishment of integrated agriculture technology model.

f) Production and supply of foundation seeds.

g) Value addition of nutri-cereals and minor millets.

h) Establishment of model stall fed sheep and goat units.

i) Production of export oriented crops.

j) Demonstration of resource conservation technologies.

k) Establishment and promotion of fodder banks.

3.1.11.4 Sponsored/ Externally Funded programmes:

Programmes sponsored by many organizations/agencies were conducted by KVKs during the year. State Agriculture departments provided financial assistance to the tune of Rs.748.57 lakh to KVKs for the purpose of organizing training, demonstrations and seminars (Table 92). National Bank for Agriculture and Rural Development (NABARD) extended financial assistance of Rs.119.63 lakh to 13 KVKs for conducting entrepreneurship development programmes. Government of India, Department of Agriculture and Co-operation sponsored programmes on protection of plant varieties and farmers rights, quality seed production, skill development etc for which financial assistance of Rs.60.97 lakh was provided. Details of other sponsoring agencies and the amount received by the KVKs are given in Table 92.

Table 92: Details of funding agencies for organizing sponsored programmes by the KVKs

Sl. No.	Sponsorship Agency	No. of KVKs	Amount (Rs lakh)
1	State Agriculture Departments	23	748.57
2	National Bank for Agriculture and Rural Development (NABARD)	13	119.63
3	Department of Agriculture and Co-operation	11	60.97
4	State Planning Boards	9	97.71
5	Coconut Development Board	8	48.02
6	Department of Bio-technology, Government of India	2	23.81
7	Karnataka State Bio-fuel Development Board	1	8.19
8	Karnataka Medicinal Plants Authority	2	6.62
9	Nehru Yuva Kendra	1	4.05
10	Fertilizer Association of India	4	2.70
	Total		**1120.27**

3.1.12 Propsperity of farmers through technological interventions

Stunted carp culture- a boon to fish growers, KVK Thiruvarur

Inland composite fish culture is a highly economic and profitable subsidiary farm enterprise in Cauvery delta region in Thiruvarur district. As rice bowl of Tamil Nadu, the farmers of Thiruvarur district have taken up composite fish culture in own ponds, temple/panchayat ponds which are dependent on canal and rain water wherein water storage period is limited to 5-6 months only. While demand for fish is on the rise in the tail end of Cauvery delta region, the production does not commensurate with the demand due to non availability of water for longer period (10-12 months) and use of ordinary carp fingerlings (8-10 gram weight). High mortality, low fish weight gain in short period of time, low productivity and less income are major drawbacks in ordinary fingerlings besides predatory fishes, weed fishes, natural enemies and diseases.

In order to cope with these drawbacks in use of ordinary fingerlings, the Krishi Vigyan Kendra, has taken up several planned interventions like training, OFT, FLD ect., in Thiruvarur district to transfer the composite culture with stunted carp culture technology since 2011. It is an indigenous technology, recommended by CIFA, in which stocking of two to three lakhs of fingerlings in an acre of fish pond and stunt the growth of fish through limited feeding for 9-12 months. Once they reached a size of 80-100 grams, they are released in grow out ponds where in the weight gain is found to be very high in a shorter period.

Over a period of two years of KVK efforts, adoption of stunted fingerlings technology observed among from 400-500 farmers in the district. Growing of stunted carp fingerlings provided the way for remunerative income to them as it is a good venture in inland fish cultivation especially village ponds which attains marketable weight within 5-6 months in the main pond/tank as well as carp attain more growth rate in second year rather than first year. Few of them were Th. Ganeshkamalakannan of Kothangudi village, Th.Karthikumar of Pullavarayangudikadu, Th. Rajkumar of Devangudi village, Th.Ravichandran of Thirumenieari village and Th.Pugazendhi of Vaduvoor village and they earned Rs. 5 - 10 lakh through selling of stunted fingerlings per annum. Further, farmers and agricultural labourer are overwhelmed with this technology in Thiruvarur district because the production of stunted fingerlings gave employment throughout the year by providing labour for pond management, feeding of fingerlings, mannuring, crop cultivation in the pond bunds, fingerlings harvest , packing and loading for transportation.

Value addition on fruits and vegetables-A successful farm enterprise

KVK, Pondicherry taken up a series of activities on promotion of value addition on fruits and vegetables as it generates additional income, self employment and also effective utilization of bulk farm produce during the peak season of the year. Ex-trainees have established home scale processing units under the technical guidance of KVK faculty in Pondicherry. Two of them are detailed below:

(i) Tmt.D.Shanmugavadhana, housewife, aged 42 is from middle class family residing at Muthialpet, Puducherry trained on value addition of fruits and Vegetables by KVK, Pondicherry and she established value addition unit during August 2013. Later the unit was linked with food safety under micro enterprise in processing of fruits and vegetables. At present, the unit produces a total of 275 litres of 4 types of squashes viz., Amla, Guava, Grape and Musambi with a net profit of Rs.15,500 per month as an additional income. This income helps her to meet the day to day expenditure and she is happy to continue this venture because her husband is earning only Rs.10,000 per month as a employee of Airtel Companey Ltd. She became a role model by training five unemployed youth of the same village towards establishing home scale units on processing of fruits and vegetables.

(ii) Tmt. Janamala, housewife, aged 34, residing at Saram, Puducherry trained on preparation of Pickle, Squashes, Jam etc. by KVK, Puducherry and established small scale processing unit during January, 2013. At present she produces 8 kg pickle, 500 litres of fruit squash and 9 kg of jam earning a

Tmt. Janamala with products in her processing unit

net profit of Rs.5000 per month. The products are packed in bottles and sachets and marketed through shops and residents in the locality. She is managing the unit by purchasing required raw materials in bulk from the farmers with the help of two women labourer. Additional income helps her to give good education and nutrition to the Children. Now she is planning to expand and prepare different variety of pickles, squashes and Jam as many people approach this unit for providing fresh and quality pickle.

Kera bouquet – an innovate activity from coconut inflorescence

Kera bouquet is an invention from Kozhikode KVK. It is a beautiful dry flower arrangement made from coconut inflorescence. The major attraction of Kera bouquet is that all the types of flower arrangement can be made from coconut inflorescence such as casual, bridal, Japanese, Western, mass, line etc. Having gained knowledge and skill on preparation of Kera bouquet at KVK, Calicut, two youngsters Mr. Binu and Mr. Kannadas established a production unit of Kera bouquet at Muthukad. At present, the unit is producing several designs of Kera bouquet on orders from within the district, other districts and other states for ceremonial functions such as bridal and casual dry bouquet and getting net profit of Rs. 2500-3000 per month as it is running only on leisure time of both of them.

Mr. Binu and Mr. Kannadas with Kera bouquet

Traditional fisherman turned sea food entrepreneur

Mr. Sukumaran, Moonnuthuruthil from Kodungallore aged 50 was a traditional fisherman doing prawn fishing and selling the catch daily in nearby markets for his livelihood. He holds the license for operating the traditional fish catching gear called "Oonnivala" at the Kottapuram backwaters. Most of these prawn are purchased by middleman for making dried prawn which have more demand in market. Having gained knowledge and skill on making dried prawn and value added products from prawn through training at KVK, Ernakulam, he

Mr. and Mrs. Sukumaran with value added prawn products

established small scale prawn processing unit with drier and other equipment in 2012 under the technical guidance of KVK faculty. KVK team also facilitated him to get Food Safety and Standards Authority of India (FSSAI) registration and a Small scale industry (SSI) registration. At present, the unit is making value added products such as ready to cook dried prawn, prawn chutney powder and roasted prawn and selling on the brand name-KAYAL CHEMMEEN. He is using raw material of fresh sea prawn from his own catch. He is producing 1 kg of dried prawn by utilizing 4 -5 kg of fresh prawn and his processing capacity is 60 kg of dried prawn per month. He earns a net income of Rs.18000 per month. Mr Sukumaran is presently an employer of five women labours at his processing unit.

Jack fruit - Value addition, branding and market linkage

India stands second in production of Jackfruit in the world producing 14.36 lakh tonnes from an area of 1,02,000 ha. In India, Karnataka ranks first with a production of 2.6 lakh tonnes from 11,333 ha. The nationwide post harvest losses is estimated to be 50% and if it were sold for Rs. 3/- per kg of whole fruit, then the losses would be Rs. 215.4 crores worth of jack fruit every year (Shree padre, 2010). It is an underutilized and over produced crop which lacks processing. Thus, Krishi Vigyan Kendra, Bangalore Rural, implemented a Frontline Demonstration (FLD) on "Preparation of Jackfruit products including branding and market linkage" among the members of two Self Help Groups of Melekote cross and Kachalli village, Doddaballapur taluk, Bangalore Rural District.

Process : SHGs namely – Shri Divya Jyothi Mahila Self Help Group of Melekote cross village and Divya Jyothi Sthri Shakthi Self Help Group of Kachalli, Doddaballapur taluk were selected for developing entrepreneurial skills through FLD on "Preparation of Jackfruit products including branding and market Linkage". A vocational training was organized for the SHG members comprising of demonstration and hands on training on preparation of various jackfruit products namely, chips, papad from raw unripe bulbs, whereas halwa, jam, RTS beverage from ripe bulbs and mixture from rind. The SHGs were sensitized on nutrient composition of jackfruit, cost economics, importance of hygiene and sanitation in production unit, marketing channels, Food Safety and Standards Authority of India (FSSAI) licensing and registration. The cost economics of the demonstrated products were also determined. They were exposed to marketing avenues of jack products for better understanding of the market demand through organizing an educational exposure visit to Mango and Jack Mela -2013 held at Lalbaguh, Bangalore as a part of vocational training programme. The minimum critical inputs to establish a small production unit such as weighing balance, sealing machine, foil sealer, labeling and packing materials were made available under FLD funded by ICAR, New Delhi. The SHGs established production units in a separate building with essential facilities such as electricity and water supply. These production units are registered under Food Safety and Standards Authority of India (FSSAI) for production and marketing of value added products from Jackfruit. After a rigorous hands-on training, the SHG members are involved in production and marketing of jackfruit products.

Impact : Horizontal Spread: The SHGs established production units in a separate building with essential facilities such as electricity and water supply. These production units are registered under Food Safety and Standards Authority of India (FSSAI) for production and marketing of value added products from Jackfruit. After the hands-on training, the SHG members are involved in production and marketing of jackfruit products. The experiences of this FLD model was shared among other farmers in the locality through organizing a field day and it created awareness about enhancement of income through processing of jack. An exhibition consisting of display of marketable products and also, a sale was organized during the field day. KVK guided the SHGs in getting market linkages such as exhibitions, fairs, local bakeries, National conference of KVKs and International Krishimela organized by UAS held at GKVK, Bangalore, and Mahila Mahotsava organized by IIHR, Bangalore on the eve of celebration of Women in Agriculture day at Lalbaguh.

Economic gains : The cost of production of each product included the actual cost of ingredients and the production cost (which includes labour, fuel, packing and labeling cost and machinery maintenance) and a profit of 30% of cost of production was added to get the sale cost. This was then equated to the marketing cost depending upon the prices existing in the market. Thus the jackfruit products cost from Rs. 100 to 300/ kg (Table 93). This ensures 30-40% profit for jackfruit products. The groups had a turnover of Rs. 75,000/- in six months by selling the products under the brand name "SIRI PRODUCTS" and "NISARGA PRODUCTS" registered under FSSAI.

Table 93. Cost economics of the value added Jackfruit products

Name of the product	Ingredients Cost * Rs. / kg (A)	Production Cost(30%) Rs. / kg (B)	TotalCost Rs./kg C=(A+B)	Profit (30%) Rs./kg (D)	Sale cost Rs. / kg (E=(C+D)	Market Cost Rs./kg (F)
Jack fruit chips	140	42	182	55	237	300
Jack fruit papad	157	47	204	61	265	300
Jack fruit RTS beverage (Liter)	55	16	71	21	92	100
Jack fruit jam	98	30	128	38	166	210
Jack fruit halwa	156	47	203	61	264	300
Jack fruit mixture	112	37	149	45	194	200

Note: * - Includes cost of packing material

Employment Generation: Twelve individuals of the two SHG's trained are making use of their free time in preparation of value added jackfruit products. The products are supplied to various outlets- such as local bakeries and shops. KVK outlet and also sale in various exhibitions are other sources of marketing the products. Thereby 12 families are benefited with additional income of about Rs. 1,000 to 1,500/- per month per family.

Productivity enhancement in sericulture through cluster approach

In spite of concerted efforts by the state the quality raw silk produced in the country is not comparable with that of silk produced by countries like China. The silk produced in China will have uniform size over a long stretch of yarn besides lower cost of production. Hence, the fabric manufacturers using power looms prefer such quality raw silk. Important reasons for getting uniform size raw silk are homogeneity in cocoon lots, large scale convertors of cocoon to raw silk and integrated approaches to recycle the sericulture by-products, to reduce the cost of cocoon and raw silk production.

Though, sporadic attempts were made in India to improve the quality of raw silk, a comprehensive approach like integrating large scale uniform cocoon production, large scale conversion of cocoon to quality raw silk and silk fabric manufacturing has not been tried. But, there is a scope to improve the yield levels and quality of raw silk to be competitive enough in the international market.

Hence, a project was designed and implemented with the support of RKVY during 2011-12 to promote community cluster approach in silkworm rearing to produce uniform quality cocoons, to encourage rearing of bivoltine breeds and to design and install efficient silk reeling and weaving units to produce high quality raw silk and standard fabric.

Chickballapur and Kolar are the major silk producing districts of Karnataka. A few representative villages of these districts were selected to promote high yielding and high quality hybrid silkworm rearing.

Success story of a cluster : Kathariguppe a village in Chintamani taluk with more than 60 sericulturists was selected to promote community cluster approach in enhancing production, productivity and quality cocoon production and further to convert cocoons into quality silk and fabric. All the sericulturists were rearing cross breeds (less yield potential). And their mulberry gardens were not maintained properly. The average cocoon yield was about 55kg/100dfls and the annual cocoon production from the entire village was about 14000kg with an average cocoon price of 180/kg (approximate returns of Rs.25,20,000).

As RKVY project intervention, firstly a group was formed and registered as Kathariguppe Bivoltine Reshme Belegarara Sangha involving all the sericulturists in the village during December 2011. Secondly, the members of the group were given technical and financial support required for Bivoltine silk production. An amount of Rs.10 lakhs was spent from the project to modify the mulberry gardens, silkworm rearing houses, equipment for scientific rearing.

All the members of the Sangha started rearing bivoltine hybrids after effecting modifications to the mulberry gardens and silkworm rearing houses. Appropriate production, grading, packing and marketing practices are being adopted by all the members of Sangha. Totally 34 crops were conducted in the cluster village by 22 farmers and 12 farmers completed two crops in the village The average cocoon yield is 64.4 kg/100dfls and the total cocoon production in 10 months was about 25,000 kg with an average price of Rs.230/kg (Approximate returns of Rs.57,50,000). The bivoltine cocoon production was 20% more than the mean yield of the taluk for the corresponding period.

The cluster approach helped the KVK to reach the entire community of sericulturists there by helping the villages in the cluster to nearly double their production and increased profitability.

Based on the success of this effort, several sericulturists from nearby villages have come forward to adopt the technologies being adopted by the members of Kathariguppe Bivoltine Reshme Belegarara Sangha. The Sangha is serving as a local resource centre to transfer bivoltine production technologies to other villagers in the district.

Further, a second cluster village Lakshmidevakote was identified with 15farmers growing mulberry in 16.25 acres. All the farmers were trained on mulberry production, rearing house management, chawki handling, silkworm rearing, compost production, harvesting and grading of cocoons. Following which, a total of 6175 dfls were brushed yielding 4893.86 kg of cocoons with an average yield of 79.25 kg per 100dfls.

Group discussion on improved practices in sericulture

Harvesting of cocoons

This experience shows that working with a group of farmers helps spread technology very fast and will have lasting impact.

3.1.13 Awards and recognition

3.1.13.1 Best Zonal Krishi Vigyan Kendra Award 2012

KVK Bangalore Rural was conferred with Best KVK award of ICAR for Zone VIII for the year 2012 based on the outstanding achievements for promotion of integrated farming system models. The award was conferred for developing role models and leader farmers on hi-tech farming system in Bangalore Rural district. The net returns realized from one ha had increased upto Rs.10 lakh/ha through adoption of scientific technologies on integrated farming system approach inclusive of arecanut, banana, flower crops, vegetables, dairy, sheep rearing and fish production. The award was presented by Union Minister of Agriculture and President, ICAR Society during the Eighth National Conference on KVK held during 23-25th October 2013 at University of Agricultural Sciences, Bangalore.

KVK Bangalore Rural receiving the best KVK Award from Hon. Union Minister of Agriculture

3.2 Agricultural Technology Information Centres

Agricultural Technology Information Centres (ATICs) provide single window services in the form of technological products, technological information, publication and advisory services to farmers and other stake holders. The details of different products and service are given below.

3.2.1 Technological Products

ATICs provided seeds(88751 kgs) worth 524.96 lakh benefitting 8603 farmers, 392421(Nos) planting material worth Rs.61.92 lakh were provided to 2049 farmers, 4781 kgs of bio-products worth Rs.3.48 lakh benefitting 322 farmers, 3270993 (Nos) bakery items worth Rs.38.61 lakh and 305460 poultry eggs (Nos) worth 7.45 lakh benefitting 3950 farmers. All put together, Rs.6.36 crore worth technological products were provided by the ATICs to 24,810 farmers (Table 94).

Table 94. Details of Technological products provided by ATICs

Product	Unit	Quantity	Value(Rs)	Farmers
Seeds	Kgs	88751.02	52496252	8603
Planting material	No	392421	6191755	2049
Bio-Product	Kgs	4781	348419	322
Bakery products	No	3270993	3860854	9886
Poultry birds (egg)	No	305460	745000	3950
Total			63642280	24810

3.2.2 Technology information

ATICS provided information support to farmers and other stake holders as detailed in the table 95 given below. A total of 5185 farmers were provided with information support through Kisan Call centres or through phone calls received from farmers directly. 1461 farmers were provided with information through letters and 1382 farmer by replying to their queries. Training programs organized by ATICs benefitted 3415 farmers / technocrats/students (Table 95).

Table 95 : Details of Technology Information provided by ATICs

Information category	Farmers benefitted	Category of information						
		Varieties / hybrids	Pest management	Disease management	Agro-techniques	Soil and water conservation	PHT and Value addition	Animal Husbandry and fisheries
Kisan Call Centre / other Phone calls from farmers	5185	1133	807	715	1241	108	69	107
Letters received	1461	16	34	29	23	5	0	0
Letters replied	1382	104	8	26	11	5	0	0
Others pl. specify (Product demonstrations)	210	0	0	0	0	0	0	0
Training to farmers / technocrats / students	3415	216	395	360	460	275	295	1030
Video shows	2857	0	0	0	0	0	0	0
Grand Total	14510	1469	1244	1130	1735	393	364	1137

3.2.3 Visits

ATICs were visited by farmers, extension personnel and other stake holders for seeking technology information and products. A total of 43043 farmers, 997 extension personnel and 624 other stake holders visited ATIC for information purpose. Similarly, 54248 farmers and 2584 extension personnel visited ATICs for technological products (Table 96).

Table 96 Details of visits by farmers and extension personnel and other stakeholders to ATICs

Purpose of visit	Number of farmer's visited	Number of Extension personnel visited	Number of Stakeholders visited
Technology Information	43043	997	624
Technology Products	54248	2583	0
Total	97291	3580	624

3.2.4 Publications

A total of 30163 publications worth Rs.12.87 lakh were provided to 2928 farmers by the ATICs during the reporting period. Among them books (25161 Nos.) worth Rs.11.45 lakh were provide to 2530 farmers. Technical bulletins (4678 Nos) worth Rs.1.29 lakh were provide to 395 farmers. Other details are given in the table 97.

Table 97. Details of publications provided by ATICs.

Particulars	Number sold	Revenue generated in Rs.	Number of farmers benefited
Books	25161	1144652	2530
CDs	274	13850	3
Technical bulletins	4678	128668	395
Technology Inventory	45	0	0
Video films	5	0	0
Grand Total	30163	1287170	2928

3.3 Technology Backstopping by Directorate of Extension

Technology backstopping for the KVKs of Zone VIII is provided by the ICAR Institutes and Directorates of Extension located in the nine State Agricultural Universities viz., University of Agricultural Sciences, Bangalore, University of Agricultural Sciences Dharwad, University of Agricultural Sciences, Raichur, Karnataka Veterinary Animal and Fisheries Sciences University, Bidar, University of Horticultural Sciences, Bagalkot, University of Agricultural and Horticultural Sciences, Shimoga, Kerala Agricultural University, Thrissur, Tamil Nadu Agricultural University, Coimbatore and Tamil Nadu Veterinary and Animal Sciences University, Chennai.

The Directorates of Extension also organized workshops/seminars/training programmes for the KVK staff and provide knowledge empowerment to Programme Coordinators and Subject Matter Specialists especially in frontier areas of agriculture and its allied disciplines. The Directors of Extension and their scientists visit KVKs and the farmers fields in the respective jurisdiction, where technology interventions are undertaken and offer appropriate suggestions for improvement. Good quality inputs viz., seeds, planting materials, bio-products, livestock breed, fingerlings, livestock products etc. were supplied by the Directorates of Extension to various KVKs both within and outside their jurisdiction.

During the reporting period, Directors of Extension and their scientists participated in 74 Scientific Advisory Committee Meetings, 32 field days, 30 training programmes and 11 Technology Weeks. In addition, they attended in 18 other programmes including farmers' meet, animal health camp, inauguration of farmers group / society in villages, Krishi Mela etc.

Field visit during training programme conducted by Directorate of Extension UAS Dharwad

The Directorates of Extension also monitored the activities of KVKs through 41 programmes including workshops/review meetings, action plan meetings, sensitization meetings, regional committee meeting, scientific workers conference, crop specific awareness programmes etc. In addition, they also visited 100 farmers' plots where on- farm trials were conducted, 244 farmers' plots of frontline demonstration and participated in 40 training programmes conducted by the KVKs, 25 extension activities and 14 Farm Field Schools programmes. Further, they have also assisted the KVKs for preparing 27 documents on success stories / case studies.

In order to provide technology backstopping on latest technologies in agriculture and its allied sectors, the Directorates of Extension also organized 57 training programmes in which 587 KVK staff from 75 KVKs participated. The thematic areas covering these training programmes included agri-business management, climate change effects and its management, communication skills for effective extension management, extension strategies for integrated farming systems, hi-tech agriculture, information and communication technology, low cost poly house technology, organic farming technologies, participatory watershed management, precision farming technologies, processing and value addition, relational database management, soil and water conservation, promotion of small livestock, dairy management techniques, disease management in livestock and poultry etc.

The Directorates of Extension also facilitated / provided good quality seeds of high yielding varieties and hybrids, planting materials, livestock and poultry breeds. During the year, 9.4 t of seeds were provided to 71 KVKs, nearly one lakh seedlings / grafts to 48 KVKs, 12.7 t of bio-products to 71 KVKs, 1730 livestock to17 KVKs, 14900 poultry birds to 14 KVKs and 31 t nutrient mixture to eight KVKs.

3.4 Special Programmes

3.4.1 Pulse crop demonstrations

Technology demonstrations for enhancing pulse production

A total of 509 demonstrations were conducted on 212 ha on major pulse crops such as blackgram, greengram, pigeonpea in NFSM implementing districts of Karnataka and Tamil Nadu as a special effort to enhance the pulses production utilizing improved technologies.

Kharif 2013

A total of 218 demonstrations were implemented on pulse crops namely blackgram (39), greengram (72), pigeonpea (92) and field bean (15) covering an area of 94.0 ha in the pulse growing districts of Karnataka during kharif 2013 (Table 98).

Blackgram: Demonstrations on integrated crop management practices, integrated disease management and pest management were conducted in Chitradurga, Dharwad and Bidar districts of Karnataka with DU-1 and TAU-I varieties covering 16 ha under rainfed condition during kharif 2013. The average yield increase was 20.2 % in demonstrations with an average yield of 9.7 q/ha as against 8.1 q/ ha under farmers practice. The BCR recorded under demonstrations was 3.3 as against 2.3 under farmers' practice (Table 98).

Greengram: Demonstrations (72) were undertaken on integrated crop management practices, new varietal introduction and integrated pest and disease management in Selection-4, BGS-9 and local varieties of greengram covering an area of 34 ha under rainfed situation Dharwad, Bellary, Bidar, Gulburga and Chitradurga districts of Karnataka state. The average yield increase ranged from 15.7 to 33.3 % with an average yield of 9.9 q/ha as against 7.9 q/ha under farmers practice. The BCR recorded under demonstrations was 3.7 as against 2.9 under farmers' practice (Table 98).

Pigeonpea: Demonstrations (92) were conducted on integrated crop management practices in TS-3-R, BSMR-736, BRG-2 and BRG-4 varieties(62), variety introduction (20) and integrated pest management (10) covering an area of 38 ha under rainfed conditions in eight major pigeonpea growing districts of Karnataka state. The results indicated that yield increase ranged from 12.1 to 129.5 % recording an average yield of 16.2 q/ ha as against 11.7 q/ha under farmers' practice. The BCR was higher in all demonstrations as against farmers' practice(Table 98).

Field bean: Demonstrations (15) were conducted in Tumkur and Mysore districts of Karnataka under rainfed condition, which recorded an increase of 9.1 % in yield as against farmers' practice with higher BCR of 2.5 (Table 98).

Rabi pulses 2013-14

A total of 291 demonstrations were implemented on pulse crops namely chickpea (142), greengram (37), blackgram (100) and pigeonpea (12) covering an area of 211.6 ha in the pulse growing districts of

Karnataka and Tamil Nadu states under technology demonstration for harnessing pulse production in the country during rabi 2013-14 (Table 99).

Chickpea: Demonstrations (142) were conducted on integrated crop management practices, integrated pest and disease management, variety introduction and seed production technology in JG-11 and Ujjawal varieties covering an area of 58 ha in 10 districts of Karnataka state. The average yield increase was 28.2 % under technology demonstration as against farmers' practice. The BCR recorded under demonstrations was higher in all technologies compared to BCR that under farmers' practice (Table 99).

Blackgram: One hundred demonstrations were laid out on integrated crop management practices in VBN-3, VBN-5, VBN-6, VBN-7 and DU-1 varieties covering an area of 39.6 ha in six districts of Tamil Nadu and one district of Karnataka states. The yield increase ranged from 11.1 to 37.5 % in Tamil Nadu and 30 % increase in Mysore district of Karnataka under demonstrations as compared to farmers' practice. The BCR recorded under technology demonstrations was higher in both the states (Table 99).

Greengram: Demonstrations (37) were laid out on integrated crop management practices in Co (Gg)-7, KM-2 and BGS-9 varieties covering an area of 15 ha in two districts of Tamil Nadu and one district of Karnataka. The yield increase due to technology demonstration ranged from 15.3 % in Co (Gg)-7 to 20.5 % in KM-2 variety in Tamil Nadu and 80 % increase in Koppal district of Karnataka state. The BCR recorded under demonstrations was higher as compared to that achieved under farmers' practice in both the states (Table 99).

Pigeonpea: A total of 12 demonstrations were conducted in 5 ha area on integrated crop management in pigeionpea in Virudhunagar district of Tamil Nadu during rabi season. The demonstrations recorded an increased yield of 8 q/ha as against 6.8 q/ha under farmers' practice with BCR of 2.3 (Table 99).

Table 98: Effect of frontline demonstrations on improved technologies in pulses during Kharif 2013.

Crop	Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
						Demo	Check		Demo	Check
Blackgram	ICM	Gulbarga	DU-1	12	5.0	11.8	10.4	13.5	3.1	2.7
	IDM	Dharwad	DU-1	15	6.0	6.6	5.5	20.0	4.5	3.8
	Pest management	Bidar	TAU-1	12	5.0	11.3	8.9	27.1	2.0	1.6
				39	16.0	9.7	8.1	20.2	3.3	2.8
Fieldbean	ICM	Tumkur	HA-4	5	2.0	8.3	6.8	22.2	2.1	1.9
	Variety introduction	Mysore	HA 4	10	4.0	12.8	12.5	2.6	2.8	2.1
				15	6.0	11.3	10.6	9.1	2.5	2.1
Greengram	ICM	Bidar	BGS-9	5	5.0	13.2	10.5	25.7	2.9	2.8
		Gulbarga	BGS-9	10	4.0	11.9	9.0	31.6	3.7	2.8
		Dharwad	S-4	12	5.0	7.8	6.6	18.2	5.3	4.6
		Gulbarga	S-4	12	5.0	12.5	10.8	15.7	4.1	3.4
	Variety introduction	Bellary	BGS-9	8	5.0	15.0	11.3	33.3	5.6	3.8
	IPDM	Chitradurga	Local	25	10.0	4.6	3.7	25.1	2.0	1.6
				72	34.0	9.9	7.9	24.8	3.7	2.9

Table 98: (*Contd...*)

Crop	Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha) Demo	Yield (q/ha) Check	% increase over check	B:C ratio Demo	B:C ratio Check
Pigeon pea	ICM	Chitradurga	BRG -2	15	6.0	18.2	13.9	30.9	4.4	3.9
		Gulbarga	BSM R 736	10	4.0	28.0	12.2	129.5	4.8	2.1
		Bidar	BSM R-736	5	2.0	25.9	12.4	109.5	5.4	3.1
		Belgaum	TS-3R	10	4.0	19.5	14.9	30.7	4.4	4.1
		Gulbarga	TS-3R	12	5.0	13.6	11.5	18.1	3.2	2.4
		Tumkur	BRG4	10	4.0	11.8	10.3	14.6	2.1	1.9
	Variety introduction	Mysore	BRG1	10	4.0	6.3	5.3	19.0	2.7	2.3
	Variety inroduction	Tumkur	BRG-1	10	5.0	14.8	13.2	12.1	2.8	2.2
	IPM	Koppal	TS-3-R	10	4.0	12.5	10.5	19.1	5.2	3.1
				92	38.0	16.2	11.7	37.0	3.8	2.8
			Kharif	218	94.0					

Table 99: Effect of frontline demonstrations on improved technologies in pulses during Rabi 2013-14.

Crop	Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha) Demo	Yield (q/ha) Check	% increase over check	B:C ratio Demo	B:C ratio Check
Karnataka										
Chickpea	ICM	Belgaum	JG-11	10	4.0	12.2	10.3	18.1	1.9	1.6
		Belgaum	JG-11	17	4.0	16.9	13.3	27.3	2.9	2.3
		Bidar	JG-11	5	7.0	13.4	10.2	30.9	4.6	3.9
		Dharwad	JG-11	10	5.0	9.5	8.3	15.2	2.3	2.1
		Gadag	JG-11	10	6.0	9.5	7.5	25.8	2.1	1.9
		Gulbarga	JG-11	10	4.0	11.6	9.3	25.7	5.4	3.1
		Gulbarga	JG-11	15	3.2	15.5	12.1	28.1	4.9	3.3
		Tumkur	JG- 11	12	4.0	3.5	3.1	12.0	2.3	2.1
		Chitradurga	JG -11	15	4.0	18.3	10.9	68.2	2.5	2.5
	IPM	Koppal	JG-11	10	58.0	12.5	9.7	28.2	3.2	2.6
	Seed production	Bellary	JG-11	8	5.0	4.5	2.5	80.0	2.3	1.6
	Variety introduction	Mysore	JG 11	10	4.0	6.5	5.0	30.0	1.9	1.6
	IDM	Bidar	Ujjawal	10	4.0	12.2	10.3	18.1	1.9	1.6
				142	4.0	16.9	13.3	27.3	2.9	2.3

Crop	Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha) Demo	Check	% increase over check	B:C ratio Demo	Check
Greengram	Cropping systems	Koppal	BGS-9	12	7.0	13.4	10.2	30.9	4.6	3.9
Blackgram	Cropping systems	Mysore	DU 1	8	5.0	9.5	8.3	15.2	2.3	2.1
Tamil Nadu										
Blackgram	ICM	Vellore	VBN 6	7	2.6	6.2	5.0	23.6	2.0	1.5
		Virudhunagar	VBN6	20	8.0	7.8	6.2	25.8	2.4	2.0
		Nagapattinam	VBN6	10	4.0	8.2	6.5	26.2	2.2	2.0
		Thiruvallur	VBN6	10	2.0	8.4	6.3	34.1	3.2	2.4
		Erode	VBN3	10	4.0	7.5	6.8	11.1	2.0	1.5
		Villupuram	VBN 7	10	5.0	10.7	7.8	37.5	2.4	2.0
	Farm mechanization	Virudhunagar	VBN5	25	10.0	7.2	6.5	10.8	2.5	2.2
				92	35.6	8.0	6.5	21.9	2.4	2.0
Greengram	ICM	Thiruvallur	KM2	10	4.0	12.2	10.1	20.5	4.3	2.6
		Virudhunagar	CO(Gg)7	15	6.0	8.3	7.2	15.3	2.1	2.0
				25	10.0	9.8	8.4	17.4	3.0	2.2
Pigeonpea	ICM	Virudhunagar	CO(Rg) 7	12	5.0	8.0	6.8	17.7	2.3	2.0
			Rabi	**291**	**117.6**					
			G.Total	**509**	**211.6**					

Demonstration of Redgram variety BSMR 736 at Gulbarga

3.4.2 National Initiative on Climate Resilient Agriculture (NICRA)

Indian Council of Agricultural Research is implementing National Initiative on Climate Resilient Agriculture (NICRA) to develop improved technologies through short term and long term research as well as to demonstrate the existing technologies on farmers' fields for enhancing the resilience. In Zone-VIII, it is being implemented in nine most vulnerable districts namely, Belgaum (drought/heat), Davanagere (drought/heat), Chikkaballapur (drought/heat) and Tumkur (drought) in Karnataka, Namakkal (drought), Villupuram (drought /flood /cyclone), Ramanathapuram (drought/flood/cyclone/salinity) and Nagapattinam (drought/flood a/salinity) in Tamil Nadu and Alleppey (water inundation/drainage in Kerala. The interventions being implemented under four modules, *i.e.* (1) Natural resources management, (2) Crop production, (3) Livestock and fisheries and (4) Institutional interventions. The progress made by these centers during the year is as under:

Module I: Natural Resources Management

This module consists of interventions related to in situ moisture conservation, water harvesting and recycling for supplemental irrigation, improved drainage in flood prone areas, conservation tillage where appropriate, artificial groundwater recharge and water saving irrigation methods. A total of 174.3 ha area has been treated with NRM related interventions covering 1422 farmers in 9 cluster of villages under NICRA. District wise details are presented in Table 100.

Table 100: Effect of demonstrations on NRM technologies for climate resilient agriculture

KVK	Technology demonstrated	Critical input	No. of farmers	Area (ha)	Measurable indicators of output
Alleppey	*In situ* composting of aquatic weeds by EM solution	EM solution	10	1.2	Compost produced/basin- 21 kg
	Organic residues for energy generation and crop production using biogas units	38 Portable biogas plant	38	-	Availability of gas -2 hr/day
Belgaum	Fodder grass on farm bunds	Stylo hemeta **Seeds**	66	29.4	Strengthening of farm bunds and use as fodder
	In-situ moisture conservation – Summer ploughing	Tractor hire charges	10	5.0	Groundwater recharged
	Planting of guava seedlings	Seedlings	2	0.2	
	Planting of mango seedlings	Alphanso	10	6.0	
	Open well Stone pitching	Labour and material cost	130		To prevent sliding side wall
	Water saving irrigation methods- drip	Drip system	4	2.0	Water saving
Chikkaballpura	Afforestation	800 seedlings of Forest	40	-	Alternate source of income
	In-situ moisture conservation –Bore well recharge	Labour and material cost	250	-	
	BBF in redgram	Red gram seeds	12	3.0	Yield 13.00q/ha

Table 100: (*Contd..*)

KVK	Technology demonstrated	Critical input	No. of farmers	Area (ha)	Measurable indicators of
	Trench cum bund	JCB hire charges	32	15.0	
	Tank desilting	-	75	2900 c ft	
Davangere	Aforestation	11800 Forest plants	45	-	-
	In-situ moisture conservation-Mulching	Polythene sheet	1	0.4	Yield (44.5 t/ha)
	Desilting and deepening of water ways leading to the check dams	--	18	-	Improved in yield of the arecanut garden
Hirehalli	Artificial ground water recharge-Open well		4	0.11	To increase the underground water
	In-situ moisture conservation-Levelling and compartment bund	Paddy	9	2.0	Paddy Yield- 35.2 q/ha
	Tank silt application	Horse gram	15	6.0	Horse gram Yield 10.4 q/ha
	Trench cum bund	Maize	27	7.0	Yield Maize 32.5 q/ha
	Water harvesting and recycling for supplemental irrigation from pond	Paddy	13	0.5	Water storage capacity increased to 11600 cu m
	Water harvesting and recycling for supplemental irrigation- Percolation pond		2	-	Avoid runoff water.
	Desilting and widening of small lake		2	0.2	Storage capacity increased to 68040 cu m
	Desilting and widening of check dam		1	0.2	Storage capacity increased to 4500 cu m 22 q/ha
	Desilting and widening of farm pond		5	0.2	Storage capacity increased to 10150 cu m
	Diversion channel for farm pond		3	0.1	Divert runoff water into farm pond

Table 100: (*Contd..*)

KVK	Technology demonstrated	Critical input	No. of farmers	Area (ha)	Measurable indicators of
	Water saving irrigation methods		2	2.0	Water use efficiency
	Water saving irrigation methods		2	1.0	
Nagapattinam	Fodder grass on farm bunds		20	5.0	
	Water saving techniques- drip	Chillies	20	10.0	
	Renovation of old drainage channel		200	-	
	Soil fertility improvement- green manuring		20	21.0	
	Soil fertility improvement- Vermicompost		10	10.0	
Namakkal	Temporary water storage pond	HDPE 200 polythene sheet.	6	6 ponds	Evaporation and percolation of water losses minimized
	Deepening, Desilting Bund formation and construction of Check dam		126	137.5	Water table increased by 12 - 20 feet for 45
	Water saving irrigation methods- Mobile sprinkler	Onion	20	35.0	To increase the water use efficiency
	Water saving irrigation methods- Drip irrigation	Jasmine	1	0.1	
	Water saving irrigation methods- Rain gun	Green gram & Black gram	12	1.4	
Ramanathapuram	Construction of new Water storage tanks- Farm pond	4	4	4.0	
	Soil fertility improvement- Composting	1 unit	35	-	
	Soil fertility improvement-Green manure	1 unit	35	-	
	Soil fertility improvement- Vermicompost	1 unit	35	-	
	Water harvesting and	1	Community	-	

Table 100: (*Contd..*)

KVK	Technology demonstrated	Critical input	No. of farmers	Area (ha)	Measurable indicators of
	recycling for supplemental	60X45X 1.5 m			
	Water harvesting and recycling for supplemental irrigation	16 m length	Community	-	
Villupuram	Broadbed and furrow production technology	Bhendi	10	3.0	Bhendi-Yield 115q/ha
	Broadbed and furrow production technology	Snake Gourd	15	1.5	Snake Gourd 355q/ha
	Water saving techniques- Drip	Brinjal (PLR2)	10	0.2	240.2 q/ha
	Water saving techniques- Drip	Rose (Panneer)	3	0.2	54 q/ha
	Water saving techniques-Drip	Jasmine (Mullai)	5	0.2	73.5 q/ha
	Water saving techniques-Drip	Chillies (green)	5	0.2	253.5 g/ha
	Water storage through farm ponds and utilization	Paddy seed	1	0.5	Rice Yield 48q/ha
	Water storage through farm ponds and utilization	Sugarcane setts	1	0.5	Sugarcane yield 1050q/ha
			1422	**174.31**	

Module II: Crop Production

Under this module, introduction of drought/temperature tolerant varieties, advancement of planting dates of rabi crops in areas with terminal heat stress, water saving paddy cultivation methods (SRI, aerobic, direct seeding), frost management in horticulture through fumigation, community nurseries for delayed monsoon, and custom hiring centres for timely planting and location specific intercropping system were the major areas of demonstration. Demonstrations were conducted involving 1010 farmers on a large number of technologies in 455.04 ha. The per cent increase in yield under technology demonstration ranged from 8.1 % in Allepey to 31.3 % in Belgaum district. District wise details are presented in Table 101.

Table 101: Effect of demonstrations on crop production technologies for climate resilient agriculture.

KVK	No. of farmers	Area (ha)	Yield Increase (%)	BCR Demo	BCR Check
Davanagere	283	95	21.6	2.1	1.7
Tumkur	265	106	21.0	2.6	1.8
Chikkaballapur	123	37	23.1	1.5	1.2
Belgaum	132	106.32	31.3	2.0	3.0
Namakkal	150	83.2	17.7	4.2	2.3
Villupuram	26	8.5	27.1	2.3	1.7
Allepey	31	19.02	8.1	2.7	2.2
Total	**1010**	**455.04**			

Module III: Livestock and Fisheries

Use of community lands for fodder production during droughts/floods, improved fodder/feed storage methods, preventive vaccination, improved shelters for reducing heat stress in livestock, management of fish ponds/tanks during water scarcity and excess water etc. were carried out under this module. The KVKs of the Zone introduced 575 animals of improved breeds, conducted vaccination camps covering 4029 animals and 205 poultry birds, established 49 units of vermicomposting and azolla and promoted improved fodder cultivation in the community lands (27.5 ha) of selected villages for use during drought period benefiting 2971 farmers. Centre-wise details are furnished in Table 102.

Table 102: Effect of demonstrations on livestock and fisheries production technologies for climate resilient agriculture

KVK	Farmers	Animals Vaccinated/Introduced (Sheep, Goat, Cow etc)	Poultry birds/ Fisheries	Fodder area (ha)/ units	Composting/ Vermicompost/ azolla unit/ shelters
Davanagere	436	1141	-	-	4
Tumkur	888	120		3	-
Chikkaballapur	225	200		0.4	-
Belgaum	374	5	-	2	-
Namakkal	222	1926	130	12.1	44
Villupuram	411	962	-	-	-
Nagapattinam	240	250	-	10	1
Allepey	175	1	75	-	-
Total	**2971**	**4605**	**205**	**27.5**	**49**

Module IV: Institutional Interventions

Strengthening of the existing institutions or initiating new ones such as seed bank, fodder bank, commodity groups, custom hiring centre, collective marketing group and introduction of weather index based insurance and climate literacy through a village weather station were major interventions under the module. NICRA implementing centres of Zone-VIII have established seed and fodder bank on 43.7 ha to meet the drought related situations, formed 21commodity groups for better coordination in technology adoption and marketing of produce, promoted mechanization on 385.8 ha with various implements under custom hiring achieving timely farm operations besides educating the farmers on weather aspects using data generated from village level weather stations and providing need based trainings on climate resilient technologies (Table 103).

Table 103: Institutional interventions implemented by the KVKs during year to achieve climate resilient agriculture

KVK	Seed/Fodder bank (ha)	Commodity (No.)	Custom hiring (area in ha served)	Climate literacy level weather station (ha)
Davanagere	-	8	78.0	7
Tumkur	17.1	-	104.0	1
Chikkaballapur	0.4	5	1.0	1
Belgaum	18.6	8	-	-

KVK	Seed/Fodder bank (ha)	Commodity	Custom hiring (area in ha served)	Climate literacy level weather station (ha)
Namakkal	1.6	-	153.4	-
Villupuram	-	-	17.0	-
Nagapattinam	6.0		-	-
Allepey	-	-	33.4	-
Total	**43.7**	**93**	**385.8**	**9**

Capacity building to farmers: During the year NICRA implementing KVKs have conducted 252 training courses on various topics related to climate resilient agriculture benefiting 3287 participating farmers including 949 women farmers (Table 104).

Table 104: Training programmes conducted on climate resilient technologies during the year

Thematic area	KVK's (No.)	Courses (No.)	Participants		
			Male	Female	Total
Animal nutrition	4	34	76	82	**158**
Awareness on crop insurance	1	1	36	9	**45**
Crop production	9	9	189	37	**226**
Crop diversification	**5**	**13**	**220**	**48**	**268**
Crop management	**14**	**22**	**200**	**89**	**289**
Disease management in dairy	2	2	22	8	**30**
Employment generation	4	3	75	37	**112**
Farm implements and machineries	4	4	40	5	**45**
Fodder and feed management	6	15	80	63	**143**
IPDM practices in agriculture and horticultural eco system	14	15	249	50	**299**
In-situ moisture conservation	1	1	13	0	**13**
Live stock management	14	20	237	148	**385**
Natural resource management	15	19	309	109	**418**
Nursery raising	5	10	164	70	**234**
Nutrient management	6	17	191	24	**215**
Pest and disease management	7	7	47	23	**70**
Value addition	6	9	126	63	**189**
Vermi-compost	3	1	6	4	**10**
Water management	7	50	58	80	**138**
Total		**252**	**2338**	**949**	**3287**

Extension Activities: During the year, 444 extension activities were carried out by NICRA implementing KVKs in the villages to create awareness among the community about possible climate change impacts on the agriculture and related sectors and measures that need to be initiated to alleviate adverse impacts. A total of 3498 beneficiaries participated in these programmes including 713 women farmers (Table 105).

Table 105: Extension activities conducted on climate resilient technologies during the year

Name of the activity	KVKs (No.)	No of programmes	No. of beneficiaries Male	Female	Total
Agro advisory services	5	200	270	54	324
Awareness Camps	6	45	736	281	1017
Commodity groups	3	19	263	40	303
Diagnostic visits	5	56	118	10	128
Exposure visits	8	16	264	49	313
Field visits	5	22	165	45	210
Group discussion	5	57	523	119	642
Method demonstrations	7	28	432	111	543
Technology week	1	1	14	4	18
Total		**444**	**2785**	**713**	3498

Temporary water storage pond lining with polythene sheet at Namakkal

Use of Mobile sprinkler for Groundnut

Goat farming at NICRA village

Exposure visit to KVK Bharamathi by Davangere farmers

Chapter 4
Human Resources Development

KVK system under Indian Council of Agricultural Research has the largest scientific manpower. KVK scientists need to be equipped with the latest scientific technologies developed by National Agricultural Research System. Considering this, Zonal Project Directorate, Zone VIII Bangalore conducted and facilitated Human Resource Development Programmes to develop the capacity of KVK scientists.

The Directorate organized one orientation training course on Technology Assessment, Refinement and Demonstration and trained 25 newly recruited KVK staff of the Zone VIII at KVK Hassan from 1st April to 05th April 2013. This programme sensitized the new recruitees about the mandated activities *viz.*, Technology Assessment and Refinement, Frontline Demonstration, Training Programmes, Extension Activities, Production and Supply of Technology Inputs etc. The programme also included practical skill training on conducting of Participatory Rural Appraisal Technique (PRA) and sharing of experiences on KVK system and its mandate. Resource persons included scientists of SAUs, Zonal Project Directorate and Development Departments.

In addition, a two day training programme on Administrative and Accounting Procedures for NGO KVKs was conducted at KVK Coimbatore during 20-21st February 2014, in which 21 administrative staff of KVKs of Zone VIII participated. The programme was a follow up of a similar initiative started last year. The participants were engaged in practical sessions involving various issues on administrative and accounting procedures.

Zonal Project Director Zone VIII Bangalore is interacting with administrative staff of KVKs in the review workshop

The Directorate also nominated 20 KVK staff to various training courses organized by different institutes including Directorate of Mushroom Research, Solan, Institute of Wood Science and Technology Bangalore, Veterinary College Shimoga, KVK Ernakulam, MANAGE Hyderabad, National Institute for Micro Small and Medium Enterprises, Hyderabad, National Institute of Plant Health Management, Hyderabad, and Regional Centre for Organic Farming, Bangalore.

Zonal Project Directorate also encourages KVK staff for updating their skills especially on frontier technologies in agriculture and its allied sectors through participation in various capacity building programmes organized by various institutes in National Agricultural Research System. A total of 693 KVK staff consisting of 94 Programme Coordinators, 523 Subject Matter Specialists, 65 Programme Assistants and 11 Administrative Staff underwent HRD programmes on various aspects of agriculture and allied sectors and also administrative and accounting procedures organized by various organizations in the country.

Major thematic areas in which Programme Coordinators, Subject Matter Specialists and Programme Assistants underwent training courses included agro-forestry models, e-Extension, agricultural marketing, climate change and agriculture, integrated crop management, integrated farming system, integrated pest management, integrated disease management, database management. seed production techniques, intellectual property rights, entrepreneurship development programme, hi-tech farming, market led extension, micro irrigation and fertigation, farm mechanization, processing and value addition, process documentation, organic certification, protection of plant varieties and farmers' rights act, soil fertility evaluation, production and management of livestock and fisheries and disease management of livestock and fisheries.

Chapter 5
Publications

Papers Presented in International/National Conferences

1. P. Kumaravadivelu and C.V. Sairam 2014 Presented a lead Paper on "Corporate social and environmental responsibility contribution from a grassroots level institution" at National seminar on Corporate Social Responsibility in Community Development Sponsored by ICSSR on Jan 22-23 (page no 662-688) at Avinashilingam University Coimbatore.

Technical / Popular Articles

1. M.Chandre Gowda and A.Balamatti 2014, "Eighth National Conference", Krishi Kaayaka, January-March, 4(1): pp.25-29

Reports

1.Annual Report 2012-13, ICAR Zonal Project Directorate (2010), Published by S.Prabhu Kumar, (Eds: M.J.Chandre Gowda, C.V.Sairam, D.V.S.Reddy, B.T.Rayudu, R.S.Ramamurthy, Mallikarjun B.Hanji and J.Mathew), ICAR Zonal Project Directorate, Zone VIII, Bangalore, India, pp.1-92.

Books including edited books

1.KVK-Puducherry- Excelling Farm Lives for four decades , Perunthalaivar Kamaraj Krishi Vigyan Kendra, Puducherry; (eds: S.Prabhu Kumar), Published by Mohan A Savery, pp.1-112

2."Out-scaling of Agricultural Technologies: Experiences of Krishi Vigyan Kendras" (2013) (eds: P.Alagesan, S.Prabhu Kumar and C.V.Sairam), Krishi Vigyan Kendra, Erode, pp.1-25

3.Harnessing Pulse Productivity, 2013 (eds.) K.D.Kokate, A.K.Singh and Lakhan Singh, Contributors: Zone VIII, S.Prabhukumar and D V S Reddy, Division of Agricultural Extension, ICAR, New Delhi, pp.1-87

4.S.Prabhukumar and B.T.Rayudu 2013, "Technical interventions – pertaining to small holder farms through KVKs", In: Souvenir of Eighth National Conference on KVKs held at UAS Bangalore during 23-25th October 2013.

5. Towards Climate Resilient Agriculture - KVKs experience from Maharashtra (eds: N. Sudhakar, V.P. Chahal and Sreenath Dixit), Division of Agricultural Extension, ICAR, New Delhi. 2014, pp. 1-92.

Publications by KVKs

KVK staff have documented and published 261 research papers, 200 technical bulletins, 637 popular articles, 1417 extension literature, 2285 news paper coverage, 33 books, 96 CD/DVD, 79 news letters on various technological aspects of agriculture and its allied enterprises.

Chapter 6
Workshops, Meetings, Conferences

During the period under report, the staff of Zonal Project Directorate-Zone VIII involved in organization/participation in various workshops, meetings and conferences as listed here under:

6.1 Organization of Meetings/Workshops

- Brain storming session on research methodologies in agricultural extension – way forward at University of Agricultural Sciences Bangalore on 26th April 2013
- Discussion meeting of High Power Committee held on 4th May 2013 at NASC, ICAR, New Delhi
- Sub Committee of High Power Committee held on 21st May 2013 at NASC, ICAR, New Delhi
- Review cum action plan workshop for nine KVKs of Zone VIII under technology demonstration components of National Initiative on Climate Resilient Agriculture at KVK Baramati during 4-5th June 2013
- Zonal Annual Review Workshop of KVKs in Zone VIII at KVK Pathanamthitta during 9-12 July, 2013.
- Discussion meeting of High Power Committee held on 17th July 2013 at NASC, ICAR, New Delhi
- Sensitization workshop on " Capacity building programmes for farmers and other stakeholders about the Protection of Plant Varieties and Farmers Right Act 2001" held on 30th September 2013 at Zonal Project Directorate, Zone VIII Bangalore
- Eighth National Conference on KVKs at University of Agricultural Sciences Bangalore from 23rd to 25th October 2013
- Discussion meeting of High Power Committee held on 7th November 2013 at NASC, ICAR, New Delhi
- Discussion meeting of High Power Committee held on 19th November 2013 at NASC, ICAR, New Delhi
- Discussion meeting of High Power Committee held on 19th to 20th December 2013 at NASC, ICAR, New Delhi
- One day scientific workshop on foot and mouth disease on 1st February 2014 at IVRI Regional Station Bangalore
- Annual Action Plan Workshop 2014-15 for KVKs of Kerala and Lakshadweep during 13th to 14th February 2014
- Annual Action Plan Workshop 2014-15 for KVKs of Tamil Nadu and Puducherry during 12th to 14th March 2014
- Annual Action Plan Workshop 2014-15 for KVKs of Karnataka and Goa during 25th to 27th March 2014

Photos depicting the different stages of KVK National Conference 2013

6.2 Participation inMeetings/Workshops/ Conferences/Seminars

The Zonal Project Director/Scientists/Officials of this Directorate participated in the following meetings/workshops/conferences/seminars/training programmes held during the period under report:

- Scientific Advisory Committee meetings and Technology Weeks organized by KVKs in Zone VIII.
- Technology Week Celebrations held in KVKs of Zone VIII
- Represented the Agricultural Extension Division of ICAR in "Krishi Vasant" Programme at Nagpur on 13.02.2014
- Resource person to Swiss Agency for Development and Corporation (SDC) in the ISCB Multi-stakeholder workshop on pigeonpea and finger millet on 23-24 April 2013 at Swiss Embassy, New Delhi
- Farmers-Scientist Interaction and District Level Exhibition on green manure crops cultivation conducted at Perugavazhdhan village in Thiruvarur district on 21st May 2013
- Resource Person in the US-INDIA-AFRICA Triangular International Programme - Resource Person in the2 months long programme "New Dimensions in Agricultural Extension Management" for African Nationals at MANAGE Hyderabad (13.10.2013 to 15.12.2013)
- Resource person in the Model Training Course on Participatory Technology Development at CPCRI Kasaragod on 25.11.2013
- Seminar on "Agricultural Technology Delivery Mechanism Through Krishi Vigyan Kendra" held at Shri Ramakrishna Mission Vidyalaya, Coimbatore on 15th November 2013
- Resource Person in the 2 weeks long programme on ICT Application in Agriculture at NAARM Hyderabad, Jan 2014 with Participants of ASEAN countries
- Resource person in the Model Training Course at NDRI Regional Station, Bangalore on 20.01.2014
- Resource person in the Model Training Course at UAS Raichur on 06.03.2014

Chapter 7
Personnel

Existing staff position of the Zonal Project Directorate, Zone VIII, Bangalore as on March 31, 2013 is presented below:

7.1 Staff in Position

Research	Dr.S.Prabhu Kumar	Zonal Project Director (upto 05-01-2014)
Management	Dr.Sreenath Dixit	Zonal Project Director (From 06-01-2014)
Position		
Scientific	Dr.M.J.Chandre Gowda	Principal Scientist (Agricultural Extension)
	Dr.D.S.Srinivasa Reddy	Principal Scientist (Agronomy)
	Dr.C.V.Sairam	Principal Scientist (Agricultural Economics)
	Dr.B.T.Rayudu	Principal Scientist (Agricultural Extension)
Technical	Shri R.S.Ramamurthy	Chief Technical Officer (Field)
	Dr.Mallikarjun Hanji	Chief Technical Officer (Computer)
	Shnri M.N.Prasad	Driver
Administrative	Mrs.C.Sunanda	Finance and Accounts Officer
	Shri J.Mathew	Assistant Administrative Officer
	Shri J.Prabu Kumar	Assistant
	Shri Thomson John	Assistant
	Mrs.Ramola Pinto	Junior Stenographer
	Shri N Vinod Kumar	LDC
	Ms.K.Roopakala	LDC
Supporting	Shri CHannkeshava	SSS (Gr.II)

7.2 Joining/Superannuation/Promotion

- Dr. S Prabhukumar Zonal Project Director, Zone VIII Bangalore was transferred as Acting Zonal Project Director, Zonal Project Directorate, Zone I, Ludhiana vide Council's Order F.No.02(02)/2010-Per.III dated 6.1.2014

- Dr.Sreenath Dixit joined as Zonal Project Director, Zone VIII Bangalore on 6th January 2014 vide Council's Order F.No.04(20)/2012-Per.III dated 6.1.2014