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Annual Report
2018 - 19



भा. कृ. अनु. प. - कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
ICAR-Agricultural Technology Application Research Institute
Zone XI, Hebbal, Bengaluru- 560 024



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PREFACE



भा. कृ. अनु. प. – कृषि प्रौद्योगिकी अनुप्रयोग
अनुसंधान संस्थान

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Research Institute Zone XI, Hebbal,
Bengaluru- 560 024



Dr. Chandre Gowda M.J
Director (Acting)

The Krishi Vigyan Kendra are now the quintessential face of the National Agricultural Extension System, being the vital link between the Research System and the Development System. As the Frontline Extension System, KVKs are serving as the immediate trouble-shooters for the emerging field level problems facing the Indian farmers. The Central and State Governments are relying heavily upon the KVK system for providing the essential scientific basis for agricultural development across the country including the interior hinterlands, extreme climatic conditions and for meeting the expectations of the entire gamut of stakeholders.

Zone XI comprising Karnataka, Kerala and UT of Lakshadweep has 48 KVKs, coordinated and monitored by ICAR ATARI, Bengaluru. The achievements made by the ICAR Agricultural Technology Application Research Institute, Bengaluru and the KVKs during 2018-19 justify the vast expectations reposed on them. KVKs focused on enhancing farmers income through productivity enhancement, cost reduction, diversification and post-harvest management including value addition and marketing. In the process, assessed 467 technologies for suitability to different micro-situations, demonstrated the proven technologies in 6080 locations, besides 478 demonstrations on hybrids of different crops and livestock enterprises. Technology uptake was supported by the KVKs by producing 3479 quintals of seeds of improved varieties, 32 lakh planting material and 2.35 lakh livestock benefitting 3.8 lakh families. Capacity building was undertaken through 4716 training courses for 173873 participants which were supplemented by 529 sponsored programmes benefitting 20356 participants. In addition to 90126 extension activities benefitting 20.47 lakh farmers and extension personnel, mobile based advisories reached 35.7 lakh and mass media was used to connect with the large community of farmers. Giving focus to biological management of crops and livestock, KVKs produced 3183 quintals of bio-products serving 1.65 lakh farmers. Soil-test based recommendations were provided for 46423 farmers representing 23783 villages.

Long duration skill development programme were taken up in a big way wherein 62 programmes of about 25 days duration each were conducted on 25 job areas. Land resources inventory based training were conducted with financial assistance from the Department of Watershed Development, Govt. of Karnataka, training 3553 farmers in about 105 villages.

Strengthening KVKs in terms of much needed scientific infrastructure was given top priority by establishing 16 district agro meteorological units, eight micro irrigation units and 6 farm mechanization centers. The seed hubs developed in eight centres during the previous years started function fully during the current year. The Krishi Kalyan Abhiyana was operationalized in three Aspirational Districts. Attracting and Retaining Rural Youth implementation has been extended to more districts.

Hon'ble Prime Minister of India directly interacted with the selected KVKs on at least two occasions during the year wherein the farmers partnering with KVKs interacted and conveyed their happiness of working with KVKs. Four Union Ministers visited 8 KVKs of the Zone and have appreciated the performance of the KVKs in the service of farmers.

It is a matter of great privilege and pleasure to present the Annual Report 2018-19, an account of the ICAR-ATARI, Bengaluru and KVKs of Karnataka, Kerala and UT of Lakshadweep.

Place: Bengaluru
Date : 6 July, 2019

(CHANDRE GOWDA M.J)



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कार्यकारी सारांश

भारतीय कृषि अनुसंधान परिषद (ICAR), नई दिल्ली, ने राष्ट्रीय स्तर पर कृषि विस्तार प्रभाग के तहत, कृषि विज्ञान केंद्रों (KVKs) का एक राष्ट्रव्यापी नेटवर्क स्थापित किया है। जोनल स्तर पर स्थापित कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान (ATARI), कृषि विस्तार प्रभाग के समग्र मार्गदर्शन और समर्थन के तहत, कृषि विज्ञान केंद्रों की गतिविधियों की निगरानी और समन्वय करता रहा है। ICR-TRI बेंगलूर , जोन XI में क्रमशः 33, 14 और 01 KVK के साथ कर्नाटक, केरल और लक्षद्वीप का क्षेत्राधिकार है। इस क्षेत्र में 48 केवीके में से 33 केवीके राज्य कृषि विश्वविद्यालयों द्वारा होस्ट किए जाते हैं, 08 केवीके गैर सरकारी संगठनों के साथ हैं और 07 केवीके आईसीएआर संस्थानों के प्रशासनिक नियंत्रण में हैं।

ICAR-ATARI का अधिदेश, प्रौद्योगिकी अनुप्रयोग और फ्रंटलाइन एक्सटेंशन शिक्षा कार्यक्रमों का समन्वय एवं निगरानी और कृषि विस्तार अनुसंधान एवं ज्ञान प्रबंधन को मजबूत करना है। KVKs का अधिदेश, अनुप्रयोग और क्षमता विकास के लिए प्रौद्योगिकी मूल्यांकन और प्रदर्शन करना है; ये KVKs, ऑन-फार्म परीक्षण, फ्रंटलाइन प्रदर्शन, क्षमता विकास गतिविधियों के माध्यम से, कृषि के लिए ज्ञान और संसाधन केंद्र के रूप में काम करते हैं और जिले में मीडिया का उपयोग करके कृषि परामर्श प्रदान करते हैं।

ICAR ATARI की गतिविधियाँ

- विभिन्न योजनाओं की बजट आवश्यकता के लिए योजना बनाई गई, वित्त पोषण एजेंसियों से प्राप्त किया गया धन, केवीके को जारी किया गया, उपयोग की निगरानी की और प्रगति की सूचना दी गई।
- वर्ष के दौरान, 8 केवीके में माननीय केंद्रीय मंत्रियों द्वारा केवीके की समीक्षा की सुविधा जुटाई गई
- केवीके इडुक्की में 16-19 मई, 2018 के दौरान आंचलिक वार्षिक समीक्षा बैठक (2017-18) आयोजित की गई
- कर्नाटक के KVK के लिए, UAS बेंगलूर, UAS धारवाड़, UAHS शिवमोग्गा, UAS रायचूर में प्री-एक्शन प्लान (2019-20) की बैठकें आयोजित की गई
- केवीके के नए भर्ती किए गए प्रमुखों के लिए एमडीपी चरण- III प्रशिक्षण का आयोजन किया
- जिला कृषि-मौसम इकाइयों को लागू करने वाले केवीके के लिए अभिविन्यास जारी किया गया
- बीज हब कार्यक्रम को लागू करने वाले केंद्रों के लिए समीक्षा कार्यशाला आयोजित के गई
- किसान FIRST कार्यक्रम को लागू करने वाले केंद्रों के लिए समीक्षा कार्यशाला आयोजित की गई
- गाँव को गोद लेने के माध्यम से, ICAR टेक्नोलॉजीज को लागू करने की योजना के लिए बेंगलूर में ICAR संस्थानों के साथ समन्वय स्थापित किया गया

आईसीएआर केवीके की गतिविधियां

प्रौद्योगिकी मूल्यांकन

- जोन के 47 केवीके, केवीके लक्षद्वीप को छोड़कर, 189 स्थानों में 467 प्रौद्योगिकियों के प्रदर्शन का आकलन करने के लिए कुल 1098 परीक्षणों का आयोजन किया गया।
- फसलों के तहत, 156 स्थानों में, 801 परीक्षणों के माध्यम से, 417 तकनीकों का परीक्षण किया गया। Varietal मूल्यांकन 342 परीक्षणों में मूल्यांकन की गई 154 तकनीकों के साथ प्रौद्योगिकी मूल्यांकन करना, एक प्रमुख विषय था। अन्य प्रमुख विषय जिन पर प्रौद्योगिकी मूल्यांकन किया गया है, उनमें एकीकृत कीट प्रबंधन (111 प्रौद्योगिकियाँ) और एकीकृत पोषक तत्व प्रबंधन (107 प्रौद्योगिकियाँ) शामिल हैं।
- पशुधन के तहत, 37 तकनीकों का परीक्षण, 106 परीक्षणों के माध्यम से किया गया, प्रमुख विषय फ़ीड और चारा प्रबंधन के साथ, 13 प्रौद्योगिकियाँ और 43 परीक्षण सम्मिलित थे।
- 12 स्थानों पर, 191 परीक्षणों के माध्यम से अन्य उद्यमों पर प्रौद्योगिकी परीक्षण किया गया। परीक्षण के प्रमुख क्षेत्रों में, महिला और बाल देखभाल प्रौद्योगिकियाँ और स्वास्थ्य और पोषण प्रौद्योगिकियाँ हैं, जिन्हें 110 परीक्षणों में चयन किया गया।

फ्रंट-लाइन (सीमावर्ती) प्रदर्शन

- अनाज और बाजरा पर 1148, तिलहन पर 136, दालों पर 755, वाणिज्यिक फसलों पर 192, फाइबर फसलों पर 70, चारे की फसलों पर 196, सब्जी फसलों पर 1024, कंद फसलों पर 32 सहित विभिन्न तकनीकों पर कुल मिला कर 6080 फ्रंटलाइन प्रदर्शन किए गए। फलों की फसलों पर 276, फुलों की फसलों पर 59, वृक्षारोपण फसलों पर 170, मसाले और औषधीय फसलों पर 237 और विभिन्न फसलों के संकर पर 478 KVK ने कर्नाटक और केरल राज्यों में 256 हेक्टेयर के क्षेत्र को कवर करने वाले कृषि फार्मों पर 30 प्रदर्शन, पशुधन पर 625 प्रदर्शन, मत्स्य पालन पर 152 प्रदर्शन और उद्यमों पर 500 प्रदर्शन किए हैं।

- धान में, कर्नाटक में औसत पैदावार 23.46 से 80.21 किंटल प्रति हेक्टेयर और केरल में, 14.85 से 85.0 किंटल प्रति हेक्टेयर है, जो कि उनके संबंधित चेक कर्नाटक में 26 से 69.11 और केरल में 8.35 से 57.1 किंटल प्रति हेक्टेयर है। मक्का में, कर्नाटक में उनके संबंधित चेक में 22.17 से 39.50 किंटल प्रति हेक्टेयर की तुलना में, प्रदर्शन भूखंडों में उपज 27 किंटल प्रति हेक्टेयर से लेकर 46 किंटल प्रति हेक्टेयर तक पायी गई। बाजरा में, कर्नाटक में, 21.04%, 33.89%, 23.71% की बढ़ी हुई उपज को उनकी जांच के दौरान क्रमशः फिंगर बाजरा, फॉक्सटेल बाजरा और थोड़ा बाजरा में दर्ज किया गया।
- कर्नाटक (116) और केरल (20) में तिलहन पर कुल 136 प्रदर्शन किए गए। मूंगफली के अंतर्गत, कर्नाटक में, स्थानीय किस्म (24.5 q / ha) की तुलना में, G2-52 की अधिकतम उपज 26.0 q / ha की गई। सीसमम किस्म जीटी -1 ने, कर्नाटक में उच्च उपज दी, जबकि, थिलरानी (4.38 किंटल प्रति हेक्टेयर) ने केरल में उच्च उपज दर्ज की गई।
- कर्नाटक (690) और केरल (65), 268.5 हेक्टेयर क्षेत्र में, चना, उर्द, मूंग, अरहर, लोबिया और सोयाबीन जैसे दालों पर कुल 755 प्रदर्शन किए गए। कर्नाटक में, डीयू -1 किस्म के उर्द में 9.15 किंटल प्रति हेक्टेयर की उपज दर्ज की गई जबकि मूंग किस्म केकेएम -3 प्रदर्शनों ने किसान अभ्यास पर 28.30% की वृद्धि पायी गई। अरहर में, मिट्टी के पोषक तत्व प्रबंधन के प्रौद्योगिकी प्रदर्शन के कारण कुल उपज में वृद्धि 42.78% पायी गई। रबी के मौसम के दौरान, चना में आईसीएम और पौधों की सुरक्षा ने क्रमशः 26.32% और 22.36% उपज में वृद्धि पायी गई।
- सब्जियों की फसलें जैसे बैंगन, गोभी, शिमला मिर्च, फुल्लगोभी, मिर्च, ककड़ी, कलौंजी, फलियां, फ्रेंचबीन, प्याज, टमाटर, बाग का मटर, रिजवार्ड, भिंडी, साग, तरबूज, तरबूज और कस्तूरी को बेहतर तकनीक के साथ प्रदर्शन किया गया। कर्नाटक के केवीके द्वारा

201.85 हेक्टेयर क्षेत्र और केरल 14.89 हेक्टेयर में प्रदर्शन।

- सुपारी नारियल, काजू और कॉफी जैसे 71 बागानों को कवर करने वाले कुल 170 प्रदर्शन किए गए। कर्नाटक में नारीयाल ICM ने 14312 नट / हेक्टेयर / वर्ष के साथ कुल 67.82% अधिक उपज दर्ज की गई। केरल में, IPM प्रौद्योगिकी प्रदर्शन पर 16000 नट / हेक्टेयर / वर्ष की पैदावार दी।
- काली मिर्च, मिर्ची (सूखा), हल्दी और धनिया को मिलाकर 54.76 हेक्टेयर क्षेत्र में कुल 229 प्रदर्शन किए गए।
- 16 हेक्टेयर के क्षेत्र को कवर करने वाले कुल 59 प्रदर्शनों को चीन के एस्टर, गुलदाउदी, चमेली, गुलाब और रजनीगंध जैसे फुलों की फसलों पर लागू किया गया, कर्नाटक और केरल के केवीके द्वारा बेहतर प्रौद्योगिकियों के तहत प्रदर्शन किया गया।
- धान, मक्का, टमाटर, सूरजमुखी, गोभी, मिर्च, कपास, बैंगन, करेला, ककड़ी, प्याज, रिजगार्ड, टमाटर, गेंदा, कंद, सूरजमुखी, चारा और तरबूज में केवीके द्वारा 478 का प्रदर्शन किया गया। कर्नाटक (445) और केरल (33) 154.23 हेक्टेयर क्षेत्र को कवर करते हैं।
- 14.20 हेक्टेयर क्षेत्र को कवर करने वाले विभिन्न कृषि उपकरणों पर 30 प्रदर्शनों के माध्यम से कृषि यांतिकारण को लोकप्रिय बनाया गया।
- ग्रामीण युवाओं के लिए, ईडीपी, मूल्य संवर्धन, पोषण उद्यान, छत बागवानी, सीप मशरूम सेरीकल्चर, सिलाई सह कढ़ाई और वर्मीकम्पोस्टिंग जैसे अन्य उद्यमों पर 500 प्रदर्शन इकाइयाँ विकसित की गईं।
- कर्नाटक और केरल के केवीके द्वारा, वर्ष के दौरान बड़े जुगाली करने वाले 410 इकाइयों, छोटे जुगाली करने वालों में 157 इकाइयों और पोल्ट्री के मामले में 48 इकाइयों को कवर करते हुए कुल 625 प्रदर्शन किए गए।

क्षमता विकास

- रिपोर्ट के तहत वर्ष के दौरान, 173873 व्यक्तियों के लिए 4716 प्रशिक्षण पाठ्यक्रम आयोजित किए गए

। इनमें से अधिकांश (3202 पाठ्यक्रम) किसानों / कृषि महिलाओं की श्रेणी के लिए थे, जिनमें 121054 किसानों / कृषि महिलाओं को प्रशिक्षित किया गया था।

- किसानों और फार्म-महिलाओं के लिए, प्रशिक्षण का प्रमुख क्षेत्र फसल उत्पादन था, जिसमें 793 पाठ्यक्रमों में 29934 किसानों / फार्म-महिलाओं को शामिल किया गया था। पौध संरक्षण (495) और गृह विज्ञान / महिला सशक्तीकरण (371) पर, प्रशिक्षण पाठ्यक्रम, मिट्टी के स्वास्थ्य और प्रजनन प्रबंधन (335 पाठ्यक्रम) के बाद, अगले सबसे अधिक मांग वाले पाठ्यक्रम थे।
- ग्रामीण युवाओं के लिए, 59 पाठ्यक्रमों (2021 प्रतिभागियों) में, मूल्य संवर्धन प्रमुख प्रशिक्षण क्षेत्र रखा गया। इसके बाद, एकीकृत खेती (1749 प्रतिभागी) और मशरूम उत्पादन (41 पाठ्यक्रम, 1042 प्रतिभागी) पर 52 पाठ्यक्रम शामिल किए गए।
- विस्तार अधिकारियों के लिए, 9874 कर्मियों के लिए, कुल 245 पाठ्यक्रम आयोजित किए गए। 30 पाठ्यक्रमों और 1210 प्रतिभागियों में, एकीकृत कीट प्रबंधन नामक अगला प्रमुख प्रशिक्षण क्षेत्र रखा गया।
- केवीके द्वारा 20356 प्रतिभागियों के लाभ के लिए, विभिन्न क्षेत्रों में कुल 529 प्रायोजित प्रशिक्षण आयोजित किए गए थे। मृदा स्वास्थ्य और प्रजनन प्रबंधन पर बड़ी संख्या में प्रशिक्षण पाठ्यक्रम (68) आयोजित किए गए थे। इसके अलावा, 4492 नवोदित उद्यमियों को शामिल करते हुए, वर्ष के दौरान, 156 व्यावसायिक प्रशिक्षण पाठ्यक्रम आयोजित किए गए। 556 और 42 प्रतिभागियों के साथ 16 पाठ्यक्रमों में, एकीकृत फसल प्रबंधन और बीज उत्पादन को प्रशिक्षण का प्रमुख क्षेत्र रखा गया। इसके अलावा, मूल्य संवर्धन (13 पाठ्यक्रम, 425 प्रतिभागी) और डेयरी फार्मिंग (11 पाठ्यक्रम, 217 प्रतिभागी) अन्य प्रमुख क्षेत्र रखे गए।

सीमावर्ती विस्तार कार्यक्रम

- केवीके ने कुल 90126 फ्रंटलाइन एक्सटेंशन गतिविधियों को अंजाम दिया और 18.24 लाख किसानों, 2.43 लाख एससी / एसटी किसानों और 1.03 लाख एक्सटेंशन कर्मियों को किस्मों, उत्पादन प्रौद्योगिकियों, एकीकृत कीट और रोग प्रबंधन, पशु स्वास्थ्य और पोषण, पोल्ट्री उत्पादन, मत्स्य प्रबंधन और मानव पोषण के बीच जागरूकता पैदा की गई।
- इसके अलावा, KVK द्वारा, समाचार कवरेज (1307), रेडियो कवरेज / वार्ता (405) और टी. वी. कवरेज / वार्ता (209) के अलावा, विस्तार साहित्य (844) और लोकप्रिय लेख (433) प्रकाशित किए गए।

तकनीकी इनपुट का उत्पादन

- केवीके ने विभिन्न फसलों की किस्मों के 3478.98 q बीज का उत्पादन और आपूर्ति की, विभिन्न फसलों और संकरों की 32.15 लाख रोपण सामग्री, 2.35 लाख पशुधन उपभेदों और मछली की उंगलियों से 3.8 लाख किसानों को लाभ हुआ।
- केवीके ने 3182.71 q जैव उत्पादों का उत्पादन और आपूर्ति की, जिसके माध्यम से 1.65 लाख किसानों को रसायनों के उपयोग को कम करके जैव नियंत्रण अपनाने के लिए प्रेरित किया गया।

किसान मोबाइल सलाहकार सेवाएं

- KVK ने 35.70 लाख किसानों को 9706 पाठ संदेश भेजे हैं। संदेश फसलों (4559) मौसम (4091), जागरूकता (494), अन्य उद्यमों (232), पशुधन (221) और विपणन (109) से सम्बन्धित थे

विश्व मृदा दिवस समारोह

- विश्व मृदा दिवस, दिनांक 05.12.2018 को ज़ोन के 44 केवीके में 7489 किसानों, 42 वीआईपी सहित मंत्रियों, सांसदों और विधायकों, 132 अन्य जन प्रतिनिधियों और 337 अधिकारियों की भागीदारी के साथ मनाया गया। मौके के दौरान, 4509 मृदा स्वास्थ्य कार्ड वितरित किए गए। ज़ोन में 118 मीडिया कवरेज में विश्व मृदा दिवस का जश्न मनाया गया।

मृदा, जल और पादप विश्लेषण

- वर्ष के दौरान, 23783 गांवों के 46423 किसानों से प्राप्त मिट्टी, पानी, संयंत्र और जैविक खाद के कुल 49665 नमूनों का विश्लेषण किया गया। किसानों को कुल 30479 मृदा स्वास्थ्य कार्ड वितरित किए गए।

वर्षा जल संचयन इकाइयाँ

- 16 केवीके में, सूक्ष्म सिंचाई प्रणाली वाली वर्षा जल संचयन इकाइयाँ स्थापित की गईं। इस सुविधा का उपयोग करते हुए कुल 52 प्रशिक्षण पाठ्यक्रम और 75 प्रदर्शन किए गए और 216749 रोपण सामग्री का उत्पादन किया गया। इसके अलावा, 19740 किसानों और 1723 अधिकारियों द्वारा, इन इकाइयों का दौरा किया और वर्षा जल संचयन तकनीकों का परिचय प्राप्त किया गया।

केवीके के अभिसरण और लिंकेज

- KVKs द्वारा, अधिकांश जिलों में कृषि प्रौद्योगिकी प्रबंधन एजेंसी (ATMA) के साथ मिलकर काम किया गया। KVK द्वारा, वर्ष के दौरान ATMA के 1259 कार्यक्रमों में भाग लिया और ATMA के सहयोग से 623 कार्यक्रमों का आयोजन किया गया।
- राष्ट्रीय कृषि विकास योजना (RKVY), राष्ट्रीय खाद्य सुरक्षा मिशन (NFSM), विभिन्न आईसीएआर संस्थानों और नेशनल बैंक फॉर एग्रीकल्चर एंड रूरल डेवलपमेंट (नाबार्ड) की परियोजनाएं, बाहरी फंडों के प्रमुख स्रोत थे, जो कि केवीके की गतिविधियाँ थीं।

बड़े पैमाने पर गोद लेने और सफलता की कहानियों के मामले

केवीके के प्रयासों के बाद, निम्नलिखित प्रौद्योगिकियों ने उत्पादकता बढ़ाने और किसानों की आय बढ़ाने के संदर्भ में बड़े पैमाने पर गोद लेने के फायदे देखे हैं:

- केवीके, कोझीकोड में होमस्टेड में बुश काली मिर्च
- केवीके, कन्नूर में भागीदारी के माध्यम से काली मिर्च के बागानों का पुनर्वास
- केवीके, बेंगलुरु ग्रामीण में गोभी में डायमंड बैंक कीट प्रबंधन

- केवीके, कोलार में द्वि-वोल्टीन रेशमकीट हाइब्रिड FC2 x FC1
- केवीके, रामनगर में मूल्य संवर्धन के माध्यम से महिलाओं का आर्थिक सशक्तीकरण

केवीके के तकनीकी और इनपुट समर्थन का पालन करके कई व्यक्ति चैंपियन किसान के रूप में उभरे हैं। उनमें से कुछ को सफलता की कहानियों के रूप में सूचीबद्ध किया गया है:

- केवीके, इडुक्की में सब्जियों का उत्पादन
- केवीके, पठानमथिटा में होम स्केल एंटरप्राइज के रूप में पोल्ट्री
- केवीके, धारवाड़ में लेगुमिनस और नॉन लेगुमिनस चारा कैफेटेरिया
- केवीके गडग में एकीकृत कृषि प्रणाली
- केवीके हावेरी में राम मेम्ने रेयरिंग
- केवीके, कोडागु में कॉफी आधारित कृषि प्रणाली में डेयरी
- केवीके, रायचूर में एकीकृत खरगोश और पोल्ट्री उद्यम
- केवीके, तुमकुर-खख में केले में उच्च घनत्व रोपण

पुरस्कार और मान्यताएँ

- श्री। सिबी जॉर्ज, त्रिशूर, केरल को जगजीवन राम अभिनव किसान पुरस्कार / जगजीवन राम इनोवेटिव फार्मर नेशनल अवार्ड -2017
- श्री। राजनारायण टी। वी।, त्रिशूर, केरल को जगजीवन राम अभिनव किसान पुरस्कार / जगजीवन राम इनोवेटिव फार्मर जोनल अवार्ड -2017
- श्री। रवीन्द्रन आर।, तिरुवनंतपुरम, केरल ने पंडित दीनदयाल उपाध्याय अंत्योदय कृषि जोनल पुरस्कार-2017

विशेष कार्यक्रम

- दालों पर क्लस्टर फ्रंटलाइन डेमोंस्ट्रेशन के तहत, कर्नाटक और केरल के केवीके द्वारा किसानों के खेतों के 1750 हेक्टेयर क्षेत्र में विभिन्न दलहनी फसलों पर 4375 प्रदर्शन किए गए।

- तिलहनों पर क्लस्टर फ्रंटलाइन प्रदर्शनों के तहत, कर्नाटक और केरल के केवीके द्वारा किसानों के 790 हेक्टेयर खेतों में मूंगफली, सोयाबीन, सूरजमुखी, घोंसला, अरंडी, अलसी, सरसों और तिल पर 1975 का प्रदर्शन किया गया।

आठ बीज हब घतघ द्वारा दालों के 2729.80 क्यू बीज का उत्पादन किया गया, जिसमें चना (111.84 q) मूंग (691.35 q), अरहर (553.40 q), उर्द (301.65 q) और लोबिया (65.00 q) शामिल थे।

- NICRA के तहत, सात क्लस्टर गांवों में 1233 किसानों को कवर करते हुए एनआरएम संबंधित हस्तक्षेप के साथ कुल 609.1 हेक्टेयर क्षेत्र का इलाज किया गया। इन गांवों में, 1792 किसानों ने 552.3 हेक्टेयर क्षेत्र में जलवायु लचीला फसल प्रौद्योगिकियों का प्रदर्शन किया। 789 प्रदर्शन इकाइयों के माध्यम से मुर्गी पक्षियों सहित अन्य 3236 पशुधन को विभिन्न जलवायु लचीला पशुधन हस्तक्षेपों के तहत प्रदर्शित किया गया है। जलवायु लचीलापन तकनीकों पर क्षमता निर्माण के एक हिस्से के रूप में, 2324 किसानों को लाभ देने वाले 83 प्रशिक्षण कार्यक्रम और 2236 किसानों को कवर करने वाली 92 विस्तार गतिविधियों और विस्तार कर्मियों को परियोजना के तहत आयोजित किया गया था।
- वर्ष के दौरान, छब्बीस केवीके, दो आईसीएआर संस्थानों और पांच राज्य कृषि विश्वविद्यालयों सहित 33 केंद्रों ने कृषि कौशल परिषद के मार्गदर्शन में 62 कौशल प्रशिक्षण कार्यक्रम आयोजित किए हैं, जिसमें चौदह अलग-अलग नौकरी भूमिकाओं के तहत 1212 प्रतिभागियों को लाभ मिला है।
- कृषि में आकर्षक और रिटैनिंग यूथ (RY) के तहत, दो केवीके द्वारा 17 प्रशिक्षण कार्यक्रम और छह एक्सपोज़र विजिट आयोजित किए गए। 608 ग्रामीण युवाओं को मधुमक्खी पालन, नारियल पर चढ़ने, वीमी-खाद तकनीक, नर्सरी तकनीक और प्रसंस्करण और पोषक तत्वों-बाजरा और कटहल के मूल्य वर्धन पर प्रशिक्षित किया गया।

- कर्नाटक सरकार के सुजाला कार्यक्रम के तहत, 10 केवीके ने वाटर लेवल विकास विभाग से वित्तीय सहायता के साथ ग्रामीण स्तर पर 109 एलआरआई प्रशिक्षण कार्यक्रम आयोजित किए। इन प्रशिक्षण कार्यक्रमों के माध्यम से, एलआरआई घटकों पर 3553 किसानों को प्रशिक्षित किया गया जैसे मिट्टी के नक्शे, मिट्टी के प्रकार, पोषक तत्व की स्थिति, मिट्टी का वर्गीकरण, फसल की उपयुक्तता और मिट्टी और जल संरक्षण के उपाय।
- वर्ष 2018-19 के दौरान 352 किसानों को लाभान्वित करते हुए जोन-इलेवन में पीपीवी और एफआरए पर दो जागरूकता कार्यक्रम आयोजित किए गए।
- ICAR-ATARI और इसके KVK ने 15 सितंबर से 02 अक्टूबर, 2018 तक स्वच्छ भारत सेवा अभियान का अवलोकन किया और 16-31 दिसंबर, 2018 को स्वच्छता पखवाड़ा मनाया, जिसमें स्वच्छता, स्वास्थ्य से संबंधित 6000 गतिविधियों का आयोजन किया गया। और स्वच्छता।
- MGGMG के तहत, वैज्ञानिकों के 126 बहु-विषयक टीमों के गठन के माध्यम से 10 आईसीएआर संस्थानों में कार्यक्रम लागू किया गया था। वैज्ञानिकों की टीमों ने 565 गोद लिए गए गांवों में काम किया और 38758 किसानों को लाभान्वित करते हुए 3990 विभिन्न सलाहकार कार्यक्रमों का आयोजन किया।
- कर्नाटक (12 केवीके), केरल (3) और लक्षद्वीप (1) में जिला कृषि मौसम इकाइयों (ऊर्जन) की स्थापना शुरू की गई है। इन केवीके के प्रमुखों के लिए 28 सितंबर, 2018 को ICR-TRI में ब्लॉक स्तर पर एग्रोमेट एडवाइजरी की तैयारी और प्रसार पर ओरिएंटेशन प्रशिक्षण का आयोजन किया गया था।
- क्षेत्र के छह आईसीएआर केवीके ने उपकरण / मशीनें प्राप्त कर ली हैं और कृषि यांत्रिकीकरण (एसएमएम) के तहत केंद्रीय सहायता से 40 लाख रुपये की दर से धन का उपयोग करके कृषि मशीनीकरण इकाइयों की स्थापना की प्रक्रिया में हैं।

- रायचूर, यादगीर, वायनाड, तुमकुरु-II, कोडागु, कासरगोड, अलापुझा और कोझीकोड द्वारा सूक्ष्म सिंचाई प्रणालियों पर प्रदर्शन इकाइयां स्थापित की गईं और अपने संबंधित दिशात्मक खेतों में और 350 किसानों को इन तकनीकों को अपनाने के लिए प्रशिक्षित किया।
- किसान कल्याण अभियान (KK) को तीन आकांक्षात्मक जिलों, रायचूर, यादगीर और वायनाड में लागू किया गया, 17180 किसानों को 331 प्रशिक्षण कार्यक्रम आयोजित करके प्रशिक्षित किया गया, इसके अलावा 5.32 लाख किसानों और विस्तार कर्मियों को सेवा प्रदान की गई। दो एस्पिरेशनल जिलों, रायचूर और यादगीर में 600 छअएझ कम्पोस्ट इकाइयां स्थापित।

किसानों FIRST

- तीन किसान FIRST केंद्रों ने फसल, बागवानी, पशुधन, उद्यम और खर्रड मॉड्यूल से संबंधित क्षेत्र स्तर पर कई हस्तक्षेप किए हैं। इस कार्यक्रम के तहत 28 गांवों के कुल 2300 घरों को लाभान्वित किया गया।

कृषि प्रौद्योगिकी सूचना केंद्र (एटीआईसी)

- कुल 111090 किसानों, 1812 विस्तार कर्मियों, 2325 छात्रों और 14103 अन्य हितधारकों ने क्षेत्र में कृषि प्रौद्योगिकी सूचना केंद्रों का दौरा किया। कुल मिलाकर, 129533 व्यक्तियों ने एटीआईसी का दौरा किया, जिसमें से 52629 ने सूचना के लिए और 74579 ने प्रौद्योगिकी उत्पादों का दौरा किया। प्रकाशनों के तहत, आगंतुकों को 13532 पुस्तकें और 647 तकनीकी बुलेटिन प्रदान किए गए।

एक्सटेंशन के निदेशालय द्वारा तकनीकी बैकस्टॉपिंग

- एक्सटेंशन के निदेशकों और उनके अधिकारियों ने 37 वैज्ञानिक सलाहकार समिति की बैठकों, 91 क्षेत्र दिनों, 72 कार्यशालाओं / संगोष्ठियों और 120 प्रशिक्षण कार्यक्रमों में भाग लिया, जिसमें कैम्पस कार्यक्रम भी शामिल किए गए।

मानव संसाधन विकास

- केवीके के नए भर्ती किए गए प्रमुखों के लिए प्रबंधन विकास कार्यक्रम ICR-TRI, बेंगलूरु द्वारा 04 जनवरी से 08 जनवरी 2019 के दौरान आयोजित किया गया।
- सार्वजनिक वित्तीय प्रबंधन प्रणाली (PFMS) पर केवीके कर्मचारियों के लिए प्रशिक्षण कार्यक्रम 4 संस्थानों में आयोजित किए गए।

प्रकाशन

- ढठख के वैज्ञानिकों ने 1 पुस्तक, 8 शोध पत्रों को प्रकाशित किया, राष्ट्रीय / अंतर्राष्ट्रीय सम्मेलनों में 4 पत्र प्रस्तुत किए और 1 पुस्तक अध्याय और 1 रिपोर्ट का संकलन किया गया

- केवीके स्टाफ ने 26 पुस्तकें, 141 शोध पत्र, 148 तकनीकी बुलेटिन, 359 लोकप्रिय लेख और 1080 समाचार पत्र कवरेज और प्रकाशित किए; घतघ ने 311 विस्तार साहित्य, 53 डीवीडी और 102 न्यूज़लेटर्स को कृषि और इसके संबद्ध उद्यम के विभिन्न तकनीकी पहलुओं पर प्रलेखित किया है।

कार्यशाला और बैठकें

- ATARI के वैज्ञानिकों ने रिपोर्टिंग अवधि के दौरान वैज्ञानिक कार्यशालाओं (18), बैठकों (31) और सम्मेलनों (2) में भाग लिया।

The Indian Council of Agricultural Research (ICAR), New Delhi, has established a nation-wide network of Krishi Vigyan Kendras (KVKs) under the Agricultural Extension Division at the National level. Agricultural Technology Application Research Institutes (ATARI) established at the Zonal level are monitoring and coordinating the activities of Krishi Vigyan Kendras under the overall guidance and support of the Agricultural Extension Division. ICAR ATARI Bengaluru, Zone XI has the jurisdiction of Karnataka, Kerala and Lakshadweep with 33, 14 and 1 KVKs respectively. Out of 48 KVKs in the zone, 33 KVKs are hosted by State Agricultural Universities, 8 KVKs are with NGOs and 7 KVKs are under the administrative control of ICAR Institutes.

The mandate of ICAR-ATARI are coordination and monitoring of technology application and frontline extension education programs; and strengthening agricultural extension research and knowledge management. The mandate of KVKs is Technology Assessment and Demonstration for its Application and Capacity Development; through on-farm testing, frontline demonstrations, capacity development activities, serve as knowledge and resource centre for agriculture and provide farm advisories using media in the district.

Activities of ICAR ATARI

- Planned for budget requirement of various schemes, received funds from funding agencies, released to KVKs, monitored the utilization and reported the progress
- Facilitated the review of KVKs by Hon'ble Union Ministers in 8 KVKs during the year
- Organized the Zonal Annual Review (2017-18) Meeting during May 16-19, 2018 at KVK Idukki
- Organized the Pre-action plan (2019-20) meetings at UAS Bengaluru, UAS Dharwad, UAHS Shivamogga, UAS Raihcur for the KVKs of Karnataka
- Organized the state-level Action Plan meeting for KVKs of Kerala and Lakshadweep during 18-19 March 2019
- Organized the MDP Phase-III training to select newly recruited Heads of KVKs
- Organized orientation to select KVKs implementing District Agro-Meteorology Units
- Organized review workshop for the centres implementing seed hub programme
- Organized review workshop for the centres implementing Farmer FIRST Programme
- Coordinated with ICAR Institutes in Bengaluru to plan for implementing ICAR Technologies through village adoption

Activities of ICAR KVKs

Technology Assessment

- 47 KVKs of the zone, excluding KVK Lakshadweep, conducted a total of 1098 trials to assess the performance of 467 technologies in 189 locations.
- Under crops, 417 technologies were tested through 801 trials in 156 locations. Varietal evaluation was the major theme of technology assessment with 154 technologies assessed in 342 trials. Other major themes on which technology assessment conducted include integrated pest management (111 trials) and integrated nutrient management (107 trials).
- Under livestock, 37 technologies were tested through 106 trials, major theme being feed and fodder management with 13 technologies and 43 trials.
- Technology testing on other enterprises was taken up through 191 trials in 12 locations. Major areas of testing are women & child care technologies and health & nutrition technologies, which were taken up in 110 trials.

Frontline Demonstrations

- 6080 frontline demonstrations on various technologies were conducted including 1148 on cereals and millets, 136 on oilseeds, 755 on pulses, 192 on commercial crops, 70 on fibre crops, 196 on fodder crops, 1024 on vegetable crops, 32 on tuber crops, 276 on fruit crops, 59 on flowers, 170 on plantation crops, 237 on spice and medicinal crops and 478 on hybrids of various crops. KVKs have also conducted 30 demonstrations on agricultural farm implements, 625 demonstrations on livestock, 152 demonstrations on fisheries and 500 demonstrations on enterprises in the states of Karnataka and Kerala.
- In Paddy, the average yield ranged from 23.46 to 80.21 q/ha in Karnataka and 14.85 to 85.0 q/ha in Kerala under frontline demonstrations as compared to their respective check (26 to 69.11 in Karnataka and 8.35 to 52.1 q/ha in Kerala). In maize, the yield in demonstration plots ranged from 27 q/ha to 46 q/ha as compared to 22.17 q/ha to 39.5 q/ha in their respective check in Karnataka. In millets, 21.04%, 33.89%, 23.71% increased yield was recorded in finger millet, foxtail millet and little millet respectively over their check in Karnataka.
- 136 demonstrations on oilseeds were conducted by the KVKs in the states of Karnataka (116) and Kerala (20). In Karnataka, under groundnut, the highest yield of 26.0 q/ha was recorded by the variety G2-52 than the local variety (24.5 q/ha). Sesamum variety GT-1 gave higher yield in Karnataka, whereas, variety Thilarani (4.38 q/ha) recorded higher yield in Kerala.
- 755 demonstrations on pulses such as chickpea, blackgram, greengram, pigeonpea, cowpea and soyabean were conducted by the KVKs in the states of Karnataka (690) and Kerala (65). In Karnataka, DU-1 variety of blackgram recorded 9.15 q/ha, whereas greengram variety KKM-3 demonstrations gave an increase of 28.30 % over farmer's practice. In pigeonpea, yield increase due to technology demonstration of soil nutrient management was 42.78 % over check. During rabi season, ICM and plant protection in chickpea gave an average increase of 26.32 % and 22.36 % in yield over check, respectively.
- Vegetable crops such as brinjal, cabbage, capsicum, cauliflower, chilli, cucumber, clusterbean, fieldbean, frenchbean, onion, tomato, garden pea, ridgegourd, okra, greens, yardlong bean, watermelon and muskmelon were demonstrated with improved technologies in 1024 farmers' fields covering an area of 216.74 ha by the KVKs of Karnataka (670 demonstration in 201.85 ha) and Kerala (354 demonstration in 14.89 ha) states.
- 276 demonstrations on acid lime, banana, fig, grapes, citrus, guava, mango and pomegranate were conducted in Karnataka (157) and Kerala (119) states covering an area of 65.35 ha.
- 170 demonstrations were undertaken on plantations like arecanut, coconut, cashew and coffee covering an area of 71 ha. In Karnataka ICM demonstrated in coconut gave an overall 67.82% higher nut yield with 14312 nuts/ha/year. In Kerala, IPM technology demonstration gave an yield of 16000 nuts/ha/year over farmers' practice.
- 229 demonstrations were undertaken in black pepper, chilli (dry), turmeric and coriander covering an area of 54.76 ha.
- 59 demonstrations covering an area of 16 ha were implemented on flower crops such as china aster, chrysanthemum, jasmine, rose and tuberose under improved technologies by the KVKs of Karnataka and Kerala.
- 478 demonstrations on hybrids in paddy, maize, tomato, sunflower, cabbage, chilli, cotton, brinjal, bittergourd, cucumber, onion, ridgegourd, tomato, marigold, tuberose, sunflower, fodder and watermelon were conducted by the KVKs in the states of Karnataka (445) and Kerala (33) covering 154.23 ha area in.
- Farm mechanization was popularized through 30 demonstrations on various farm implements covering an area of 14.20 ha.
- For rural youth, 500 demonstration units were developed on other enterprises such as EDP, Value addition, nutrition garden, terrace gardening, oyster mushroom, sericulture, tailoring cum embroidery and vermicomposting.
- 625 demonstrations were conducted in livestock covering 410 units in large ruminant, 157 units in small ruminants and 48 units in case of poultry during the year by the KVKs of Karnataka and Kerala.

Capacity Development

- 4716 training courses were organized for 173873 persons. Majority of these (3202 courses) were for farmers/farm women category in which 121054 farmers/farm women were trained.

- For farmers and farmwomen, the major area of training was crop production in which 793 courses were conducted involving 29934 farmers/farmwomen. Training courses on plant protection (495) and home science/women empowerment (371) were the next most demanded courses followed by soil health and fertility management (335 courses).
- For rural youth, value addition was the major training area with 59 courses (2021 participants) followed by 52 courses on integrated farming (1749 participants) and mushroom production (41 courses, 1042 participants).
- For extension functionaries, a total of 245 courses were organized for 9874 personnel. Integrated pest management was the major training area with 30 courses and 1210 participants.
- 529 sponsored trainings were conducted by the KVKs in different areas for the benefit of 20356 participants. Large number of training courses (68) were organized on Soil health and fertility management. In addition, 156 vocational training courses were organized during the year involving 4492 budding entrepreneurs. Integrated crop management was the major area of training with 16 courses and 556 participants respectively. Value addition (13 courses, 425 participants) and dairy farming (11 courses, 217 participants) were the other major areas.

Frontline Extension Programmes

- KVKs carried out a total of 90126 frontline extension activities and created awareness among 18.24 lakh farmers, 2.43 lakh SC/ST farmers and 1.03 lakh extension personnel on varieties, production technologies, integrated pest and disease management, animal health and nutrition, poultry production, fisheries management and human nutrition.
- KVKs published extension literature (844) and popular articles (433), besides newspaper coverage (1307), radio coverage/talks (405) and TV coverage/talks (209).

Production of Technological Inputs

- Produced and supplied 3478.98 q of seeds of different crop varieties, 32.15 lakh planting material of different crops and hybrids, 2.35 lakh of livestock strains and fish fingerlings benefiting 3.81 lakh farmers.

- Produced and supplied 3182.71 q of bio-products through which 1.65 lakh farmers were motivated to adopt bio-control by reducing use of chemicals.

Kisan Mobile Advisory Services

- Sent 9706 text messages to 35.70 lakh farmers. The messaging was related to crops (4559) followed by weather (4091), awareness (494), other enterprises (232), livestock (221) and marketing (109).

World Soil Day Celebration

- The World Soil Day was celebrated on 5.12.2018 at 44 KVKs of the Zone with participation of 7489 farmers, 42 VIPs including ministers, MP and MLAs, 132 other public representatives, and 337 officials. During the occasion, 4509 soil health cards were distributed. The celebration of world soil day was covered in 118 media coverage in the zone.

Soil, Water and Plant Analysis

- 49665 samples of soil, water, plant, and organic manure received from 46423 farmers belonging to 23783 villages were analyzed and 30479 soil health cards were distributed to farmers.

Rainwater Harvesting Units

- Rainwater harvesting units with micro irrigation system have been established in 16 KVKs. A total of 52 training courses and 75 demonstrations were conducted and 216749 planting material were produced utilizing this facility. Further, 19740 farmers and 1723 officials visited these units and got acquainted with the rainwater harvesting techniques.

Convergence and Linkages of KVKs

- KVKs worked in close collaboration with Agriculture Technology Management Agency (ATMA) in most of the districts. KVKs participated in 1259 programmes of ATMA during the year and organized 623 programmes in collaboration with ATMA.
- Rastriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), projects of various ICAR Institutes and National Bank for Agriculture and Rural Development (NABARD) were the major sources of external funds that supported KVK activities.

Cases of large scale adoption and success stories

Out of the efforts of KVKs, following technologies have seen large scale adoption owing to advantages in terms of enhancing productivity and augmenting income of farmers:

- Bush pepper in homesteads at KVK, Kozhikode
- Rehabilitation of black pepper gardens through participatory approach at KVK, Kannur
- Diamond back moth management in cabbage at KVK, Bengaluru Rural
- Bi-voltine silkworm hybrid FC2 x FC1 at KVK, Kolar
- Economic empowerment of women through value addition at KVK, Ramanagara

Many individuals have emerged as champion farmers by following the technological and input support of KVKs. Some of them are listed as success stories:

- Vegetable seedling production at KVK, Idukki
- Poultry as home scale enterprise at KVK, Pathanamthitta
- Leguminous and non leguminous fodder cafeteria at KVK, Dharwad
- Integrated Farming System at KVK Gadag
- Ram Lamb Rearing at KVK Haveri
- Dairy in coffee based farming system at KVK, Kodagu
- Integrated rabbit and poultry enterprise at KVK, Raichur
- High density planting in banana at KVK, Hirehalli

Awards and Recognisations

- Shri. Ciby George, Thrissur, Kerala received Jagjivan Ram Abhinav Kisan Puraskar /Jagjivan Ram Innovative Farmer National Award-2017.
- Shri. Rajanarayanan T.V., Thrissur, Kerala received Jagjivan Ram Abhinav Kisan Puraskar /Jagjivan Ram Innovative Farmer Zonal Award-2017.
- Shri. Raveendran R., Thiruvananthapuram, Kerala received Pandit Deendayal Upadhyay Antyodaya Krishi Zonal Puraskar-2017.

Special Programmes

- Under Cluster Frontline Demonstrations on pulses, 4375 demonstrations on different pulse crops viz., blackgram, greengram, pigeonpea, chickpea and cowpea were conducted by KVKs of Karnataka and Kerala in an area of 1750 ha of farmers fields.
- Under cluster frontline demonstrations on oilseeds, 1975 demonstrations on groundnut, soybean, sunflower, niger, castor, linseed, mustard and sesame

were conducted by KVKs of Karnataka and Kerala in 790 ha of farmers fields.

- Produced 2729.80 q seeds of pulses by eight seed hub KVKs, which included chickpea (111.84 q) greengram (691.35 q), pigeonpea (553.40 q), blackgram (301.65 q) and cowpea (65.00 q).
- Under NICRA, a total of 609.1 ha area was treated with NRM related interventions covering 1233 farmers in seven NICRA cluster villages. In these villages, 1792 farmers demonstrated climate resilient crop technologies in an area of 541.9 ha. Further 3236 livestock, including poultry birds have been demonstrated under various climate resilient livestock interventions through 789 demonstration units. As a part of capacity building on climate resilient technologies, 83 training programmes benefiting 2324 farmers and 92 extension activities covering 2236 farmers and extension personnel were organised under the project.
- During the year, 33 centres including twenty six KVKs, two ICAR institutes and five state agricultural universities have organised 62 skill training programmes under the guidance of Agricultural Skill Council of India benefitting 1212 participants under fourteen different job roles.
- Under Attracting and Retaining Youth in Agriculture (ARYA), 17 training programmes and six exposure visits were organized by two KVKs. 608 rural youths were trained on bee keeping, coconut climbing, vemi-compost techniques, nursery techniques, and processing and value addition in nutri-milletts and jackfruit.
- Under Sujala programme of Government of Karnataka, 10 KVKs conducted 109 LRI training programs at village level with the financial assistance from Department of Watershed Development. Through these training programs, 3553 farmers were trained on the LRI components like, soil maps, soil types, nutrient status, soil classification, crop suitability and soil and water conservation measures.
- Two awareness programs on PPV&FRA were organized in Zone-XI benefitting 352 farmers during the year 2018-19.
- The ICAR-ATARI and its KVKs observed Swachhta Hi Seva Hai Campaign from 15 September to 02 October, 2018 and Swachhta Pakhwada during 16-31 December, 2018 organizing 6000 activities related to cleanliness, health and hygiene.

- The MGGM program was implemented in 10 ICAR institutes through formulation of 126 multidisciplinary teams of scientists. Scientists in teams worked in 565 adopted villages and conducted 3990 various advisory programmes benefitting 38758 farmers.
- Establishment of District Agricultural Meteorological Units (DAMU) in 16 KVKs of Karnataka(12), Kerala(3) and Lakshadweep(1) of Zone XI has been initiated. Orientation training on preparation and dissemination of Agromet Advisories at Block level was organised at ICAR-ATARI on 28 September, 2018 for the heads of these KVKs.
- Six ICAR KVKs of the zone have acquired implements/machines and are in the process of establishing farm mechanization units using the funds from the Central Assistance under Sub-Mission on Agricultural Mechanization (SMAM) at the rate of Rs 40 lakh each.
- Established demonstration units on micro irrigation systems by 8 KVKs viz., Raichur, Yadgir, Wayanad, Tumakuru-II, Kodagu, Kasaragod, Alappuzha and Kozhikode in their respective instructional farms and trained 350 farmers to adopt these technologies.
- Kisan Kalyan Abhiyan (KKA) was implemented in three aspirational districts viz., Raichur, Yadgir and Wayanad. 17780 farmers were trained by organizing 331 training programmes, besides providing extension services to 5.32 lakh farmers and extension personnel. Established 600 NADEP compost units in two aspirational districts viz., Raichur and Yadgir.

Farmers' FIRST

- Three Farmer FIRST centers have made several interventions at the field level related to crop, horticulture, livestock, enterprise and IFS modules. A total of 2300 households in 28 villages were benefited under this programme.

Agricultural Technology Information Centers (ATICs)

- A total of 111090 farmers, 1812 extension personnel 2325 students and 14103 other stakeholders visited Agriculture Technology Information Centres in the zone. Altogether, 129533 persons visited the ATICs, out of which, 52629 visited for information and 74579 visited for technology products. Under publications, 13532 books and 647 technical bulletins were provided to the visitors.

Technological backstopping by Directorate of Extension

- Directors of Extension and their officials participated in 37 Scientific Advisory Committee Meetings, 91 field days, 72 workshops/seminars and 120 training programmes including off campus programmes.

Human Resource Development

- Management Development Programme for newly recruited Heads of KVKs was organized by ICAR-ATARI, Bengaluru during 04th January to 08th January 2019.
- The training for KVK staff on the Public Financial Management System (PFMS) were conducted in 4 institutes.

Publications

- Scientists of ATARI published 1 book, 8 research papers, presented 4 papers at national/international conferences and contributed 1 book chapter and compiled 1 report
- KVK staff published 26 books, 141 research papers, 148 technical bulletins, 359 popular articles and 1080 newspaper coverage and; KVKs have documented 311 extension literature, 53 DVD and 102 newsletters on various technological aspects of agriculture and its allied enterprise.

Workshops and Meetings

- The scientists of ATARI attended scientific workshops (18), meetings (31) and conferences (2) during the reporting period.

ABOUT ICAR AGRICULTURAL TECHNOLOGY APPLICATION RESEARCH INSTITUTE

The Agricultural Extension Division, one of the eight divisions of Indian Council of Agricultural Research (ICAR), New Delhi, has established a nation-wide network of Krishi Vigyan Kendras (KVKs). The KVKs are hosted by ICAR institutes, SAUs, State Government Departments and NGOs with 100 per cent financial support of Government of India. The Agricultural Extension Division headed by the Deputy Director General (Agricultural Extension) monitors and reviews the progress of KVKs through 11 ICAR-Agricultural Technology Application Research Institutes (ATARI) located in the country. The jurisdiction of ICAR-ATARIs is illustrated in Table 1.

Table 1: States & UTs covered by Agricultural Technology Application Research Institutes

Zone	No. of States/UTs	States/UTs
I	4	Punjab, Uttarakhand, Himachal Pradesh, Jammu & Kashmir
II	3	Rajasthan, Haryana, Delhi
III	1	Uttar Pradesh
IV	2	Bihar, Jharkhand
V	3	West Bengal, Odisha, Andaman & Nicobar
VI	3	Assam, Arunachal Pradesh, Sikkim
VII	5	Tripura, Nagaland, Manipur, Mizoram, Meghalaya
VIII	5	Maharashtra, Gujarat, Daman and Diu, Dadra & Nagar Haveli, Goa
IX	2	Madhya Pradesh, Chhattisgarh
X	4	Andhra Pradesh, Telangana, Tamil Nadu, Puducherry
XI	3	Karnataka, Kerala, Lakshadweep

1.1 Mandate of ICAR-ATARI

The mandate of ICAR-ATARI are as follows

- Coordination and monitoring of technology application and frontline extension education programs.
- Strengthening agricultural extension research and knowledge management.

1.2 ICAR-ATARI; ZONE-XI, BENGALURU

1.2.1 Genesis

ICAR established eight Zonal Coordinating Units (ZCUs) in 1979 to monitor and coordinate the Lab to Land Programme (LLP) launched on the occasion of ICAR's Golden Jubilee (1979). To begin with, Zonal Coordinating Unit-Zone VIII functioned from its office at Tamil Nadu Agricultural University (TNAU), Coimbatore and was shifted to the campus of the Regional Station of National Dairy Research Institute (NDRI), Bangalore in September, 1981. The jurisdiction then included Karnataka, Kerala, Tamil Nadu, Puducherry



and Lakshadweep. The unit was converted as a Plan Scheme with additional staff in 1986 and additional mandate 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 mandate of implementing and monitoring of National Pulse Project was added, besides addition of Goa to the jurisdiction of the zone. The ZCU was upgraded as Zonal Project Directorate (ZPD) in March 2009 and again as Agricultural Technology Application Research Institutes (ATARI) in July 2015. As per the reorganization of Zones, ATARI Bengaluru became Zone XI w.e.f. April 2017 covering Karnataka, Kerala and Lakshadweep.

1.2.2 Staff

Total sanctioned staff strength of ICAR-ATARI-Zone XI, Bengaluru is 18, out of which 12 are currently filled (Table 2).

Table 2: Staff strength of ICAR-ATARI-Zone XI, Bengaluru (as on 31.03.2019)

Category	Sanctioned (No.)	Filled (No.)
Director (RMP)	1	0
Scientific	6	5
Technical	2	2
Administrative	8	5
SSS (Gr-II)	1	0
Total	18	12

1.2.3 Organizational Structure

The organizational structure of ICAR-ATARI-Zone XI and its jurisdiction of KVKs is depicted in Fig.1.

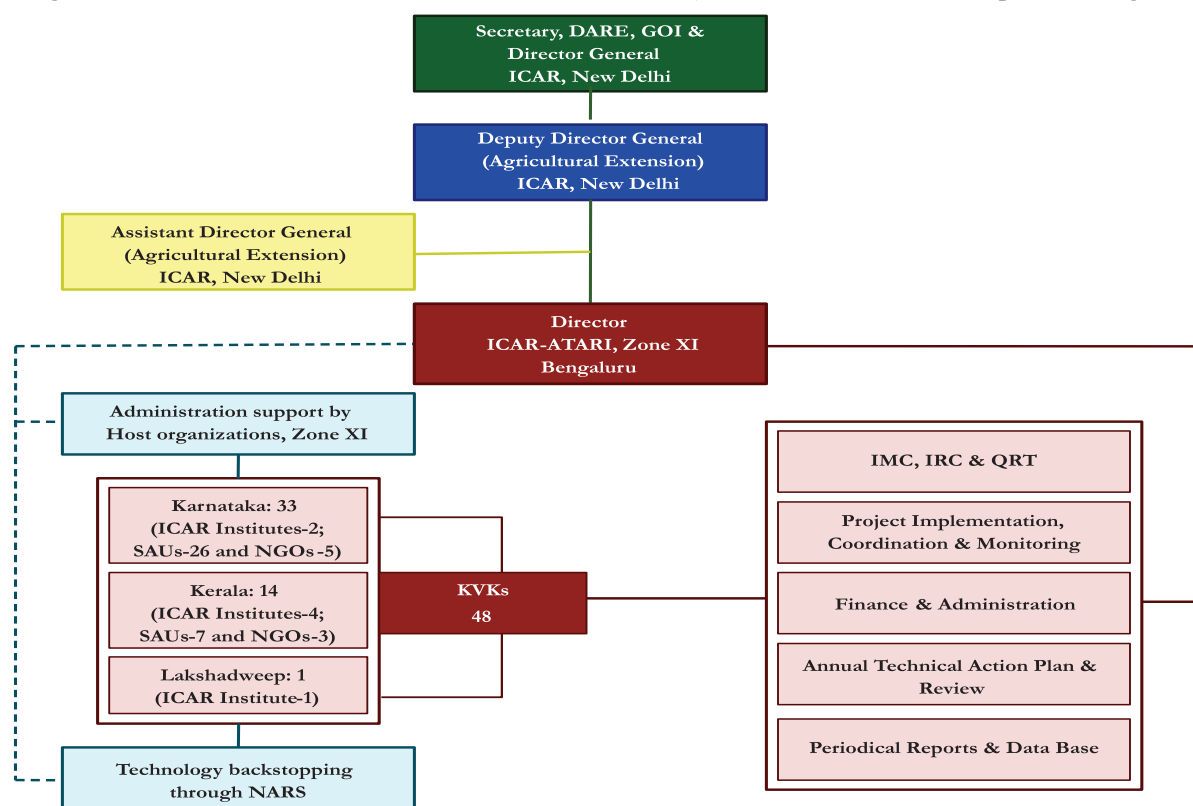


Fig 1: Organizational structure and nature of activities of ICAR-ATARI, Zone XI

1.2.4 Major Activities

Annual Review Workshop of KVKs

Annual Review Workshop of KVKs of ICAR-ATARI, Bengaluru was organized in collaboration with ICAR-KVK, Idukki during 16-19 May, 2018. KVKs of Karnataka and Kerala participated in the Workshop. Dr. M.S. Nataraju, Hon'ble Vice Chancellor UAS Bengaluru. Dr. M J Chandre Gowda, Director, ICAR-ATARI, Bengaluru; Directors of Extension Education of SAUs; Scientists of ICAR-ATARI, Bengaluru; and Heads of KVKs participated in the workshop. During the workshop, the heads of KVKs presented Annual Progress of their respective KVKs for the year 2017-18 and discussed the relevance of results to the farming community.



Group photo of the participants of Zonal Annual Review Meeting at KVK Idukki

Action Plan of KVKs

Annual Action plan workshop 2019-20 to the KVKs of Kerala and Lakshadweep was held during 18-20th March 2019 at Karshaka Bhavan, KAU, Thrissur. The KVK Heads along with SMSs made presentations before the panel of subject experts from KAU, KAVSU, Director ATARI and scientist from ICAR institutes and fisheries university of Kerala. After thorough discussion the technical programme for 2019-20 was finalised. Dr. Jiju P.Alex, Director of Extension Education, KAU and Dr. D.V.S Reddy, Principal Scientist, ATARI Coordinated the workshop.

Review of KVKs by Union Ministers

As per the decision of Government of India, Hon'ble Union Ministers who hail from Karnataka and Kerala have visited the KVKs in the Zone as detailed below.

Sl.	Name of Hon'ble Minister and Constituency	Ministry	KVKs reviewed	Date
1	Shri D.V. Sadananda Gowda MP Bangalore (North)	Minister of Statistics and Programme Implementation.	Bangalore Rural Chikkaballapur	11.09.2018 11.09.2018
2	Shri Ramesh Chandappa Jigajinagi, MP Bijapur	MoS, Ministry of Drinking Water and Sanitation	Vijayapura-I Bagalkot	20.06.2018 17.07.2018
3	Shri Anant Kumar Hegde, MP Uttara Kannada	MoS, Ministry of Skill Development and Entrepreneurship	Uttar Kannada Dharwad	01.07.2018 05.07.2018
4	Shri Alphons K.J. Rajya Sabha	MoS Ministry of Tourism (IC), Electronics and Information Technology	Thiruvananthapuram- Pathanamthitta	01.07.2018 02.07.2018



Bengaluru Rural KVK Review by Hon'ble Union Minister Shri D.V.Sadananda Gowda



Uttara Kannada KVK Review by Hon'ble Union Minister Shri Ananth Kumar Hegde



Bagalkot KVK Review by Hon'ble Union Minister Shri Ramesh Jigajinagi



Dharwad KVK Review by Hon'ble Union Minister Shri Ananth Kumar Hegde

Orientation for DAMU implementation centres

One day orientation training on 'preparation and dissemination of Agromet Advisories at Block level under Gramin Krishi Mausam Seva (GKMS) scheme was organised at ATARI Zone XI Bangalore on 28 September, 2018. The programme coordinators of 15 KVKs of Zone XI, 12 in Karnataka and 3 in Kerala have participated in the training programme. The program was inaugurated by Director ATARI Bengaluru in the presence of Dr. S.D Attri, DDG (Agrometeorology) IMD, New Delhi. Dr Kripan Ghosh, IMD Pune, Dr Geetha Agnihotri, IMD Bangalore and Dr.DV Srinivasa Reddy, Nodal officer, DAMU, ICAR-ATARI Bengaluru.



Orientation for DAMU implementing centres at ATARI Bengaluru

Review of Seed Hub Activities

ATARI Bengaluru organized the review of seed hub activities in the presence of Officers from Ministry of Agriculture, Government of India. All the eight KVKs implementing the seed hub program were present during the review.

Taking feedback from the seed hub implementing centres at ATARI Bengaluru



1.3 BUDGET

Under the KVK schemes Rs. 6191.1 lakh was sanctioned for the year 2018-19 and Rs. 6190.11 lakh of the sanctioned budget was incurred as expenditure. Head-wise details of budget and expenditure under KVK schemes and other additional schemes / programs are furnished in Table 3.

Table 3 : Head-wise budget details of ATARI Bengaluru for 2018-19

(Rs. in Lakh)

Heads	Sanction				Expenditure			
	ATARI	KVKs	Support to DEE at SAUs	Total	ATARI	KVKs	Support to DEE at SAUs	Total
KVK Scheme								
(A) Recurring								
Pay & Allowance	247.00	4996.00	0.00	5243.00	246.97	4996.00	0.00	5242.97
T.A	16.81	64.21	4.35	85.37	16.81	64.21	4.35	85.37
HRD	0.61	0.61	3.35	3.96	0.61	0.00	3.35	3.96
Contingencies	44.76	518.69	10.50	573.95	43.23	518.69	10.50	572.42
Total (A)	309.18	5578.90	18.20	5906.28	307.61	5578.90	18.20	5904.72
(B) Non Recurring								
Works	0.00	198.89	0.00	198.89	0.00	198.89	0.00	198.89
Furniture & Equipment	2.25	28.35	0.00	30.60	2.22	28.35	0.00	30.57
Vehicle	0.00	40.00	0.00	40.00	0.00	40.00	0.00	40.00
Library	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Revolving Fund	0.00	6.00	0.00	6.00	0.00	6.00	0.00	6.00
Total (B)	2.25	273.24	0.00	275.49	2.22	273.24	0.00	275.46
Total (A+B)	311.43	5852.14	18.20	6181.77	309.83	5852.14	18.20	6180.17
Special Programmes								
ARYA	2.30	61.93	0.00	64.23	1.98	61.93	0.00	63.91
NICRA	5.87	60.02	0.00	65.89	5.18	60.02	0.00	65.20
NFSM	7.76	165.30	0.00	173.06	3.12	102.38	0.00	105.50
NMOOP	7.06	73.50	0.00	80.56	3.68	72.50	0.00	76.18
FFP	3.40	70.50	0.00	73.90	3.31	70.50	0.00	73.81
DAMU	3.20	76.80	0.00	80.00	0.62	76.80	0.00	77.42
Sujala - 3	16.85	66.6	0.00	83.45	4.42	39.09	0.00	43.51



ABOUT KRISHI VIGYAN KENDRAS

Krishi Vigyan Kendras (KVK) are the agricultural knowledge and resource centres for farmers, farmwomen, rural youth and extension functionaries at the district level. These are the innovative institutions for promoting science-based practices in agriculture and allied sectors in a problem-solving mode. KVKs accomplish this through assessment and demonstration of location specific technology modules. Besides, they also perform activities keeping in view the needs of farmers and other stakeholders.

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. 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 had the privilege of establishing the first additional KVK in Tumakuru district, Karnataka in the country. Reorganization of zones was implemented w.e.f April 2017 and ATARI Bengaluru became Zone XI with jurisdiction of 3 states/UTs Viz., Karnataka, Kerala and Lakshadweep. There are 48 KVKs in the Zone, under the administrative control of various host organizations, the distribution of which is given in Table 4.

Table 4: State and host organization-wise KVKs in Zone XI

States/UT	Host organization-wise KVKs (No.)			Total KVKs (No.)
	SAUs	NGOs	ICAR Institutes	
Karnataka	26	5	2	33
Kerala	7	3	4	14
Lakshadweep	-	-	1	1
TOTAL	33	8	7	48

SAU - State Agricultural University; NGO - Non-Governmental Organization

2.2 VISION, MISSION, MANDATE AND ACTIVITIES OF KVKs

Vision

Science and technology-led growth leading to enhanced productivity, profitability and sustainability of agriculture

Mission

Farmer-centric growth in agriculture and allied sectors through application of appropriate technologies in specific agro-ecosystem perspective

Mandate

Technology Assessment and Demonstration for its Application and Capacity Development

Activities

- On-farm testing to assess the location specificity of agricultural technologies under various farming systems.
- Organize Frontline Demonstrations to establish production potential of technologies on the farmers' fields.
- Capacity development of farmers and extension personnel to update their knowledge and skills on modern agricultural technologies.
- To work as knowledge and resource centre of agricultural technologies for supporting initiatives

of public, private and voluntary sector in improving the agricultural economy of the district.

- Provide farm advisories using ICT and other media means on varied subjects of interest of farmers

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 48 KVKs of Zone XI is 768, out of which 509 (66.28%) are in position. Details of state 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 (33 KVKs)		Kerala (14 KVKs)		Lakshadweep (1 KVK)		Total (48)	
	S	F	S	F	S	F	S	F
Programme Coordinator	33	27	14	13	1	0	48	39
Subject Matter Specialist	198	152	84	69	6	1	288	197
Programme Assistant	99	77	42	26	3	0	144	90
Administrative	66	40	28	23	2	0	96	63
Driver	66	45	28	21	2	0	95	60
Supporting	66	38	28	26	2	2	97	60
Total	528	379	224	178	16	3	768	509
Percentage filled	71.78		80.46		18.75		72.92	

S-Sanctioned posts (No.) F-Filled positions (No.)

2.4 INFRASTRUCTURE AT KVKs

In Zone XI, 43 KVKs have administrative building and 39 KVKs have farmers hostel. There are staff quarters in 28 KVKs, beside 16 KVKs have established rain water harvesting units, 21 KVKs have e-connectivity, 38 KVKs have soil and water testing labs, 7 KVKs have portable carp hatchery, 3 KVKs have minimal processing unit and 14 KVKs have plant health diagnostic labs, 44 KVKs have four-wheelers. There are 80 demonstration units in these KVKs.

Table 6: State wise details of infrastructure in KVKs (No.)

Infrastructure	Kar-nataka	Kerala	Lakshad-weep	Total
Administrative building	29	14	0	43
Farmers hostel	27	12	0	39
Staff quarters	19	09	0	28
Demo Units	49	31	0	80

Rainwater Harvesting Unit	10	06	0	16
E-Connectivity	11	10	0	21
Soil & Water Testing Lab	24	13	01	38
Portable Carp Hatchery	04	03	0	7
Minimal Processing Unit	01	02	0	3
Plant Health Diagnostic Lab	09	05	0	14
Four wheeler	31	13	0	44
Two Wheeler	63	28	03	94

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 members include

Director of ATARI, Director of Extension, officials from all development departments of the district, and representatives of farmers/farmwomen. SAC discusses the progress of work done as per mandate and provide guidance for future activities. A total of 38 KVKs conducted SAC meetings during the reporting period.

Perspective Planning for KVK Lakshadweep

The High level Consultation on Perspective Plan for the ICAR-KVK-Lakshadweep was held at Kavaratti, Lakshadweep on 9 th March, 2019, under the chairmanship of Dr A.K. Singh, Deputy Director General (Agricultural Extension), ICAR, New Delhi. Shri Damodar, A.T., I.F.S., Secretary (Agriculture, Fisheries and Animal Husbandry), U.T of Lakshadweep and Dr M.J. Chandre Gowda, Director, ICAR-ATARI, Bengaluru, scientists from ICAR institutes (CPCRI, CMFRI, CIFT and CIARI), heads of development departments of Lakshadweep (Agriculture, Fisheries, Animal Husbandry, and Rural Development), representatives from All India Radio, Lead Bank, lead farmers etc. participated in the consultation.



Dr.A.K.Singh, DDG (Agricultural Extension), chairing the meeting at Lakshadweep

2.6 REVOLVING FUND

Revolving fund is in operation at 46 KVKs of the Zone. The KVKs are utilizing revolving fund for production of technological products. The net balance as on 31st March, 2019 was Rs.11.28 crore. Eighteen KVKs have closing

balance of more than Rs.20 lakh, twelve KVKs have a balance in the range of Rs.10 to 20 lakh, ten KVKs have closing balance in the range of Rs.4 to 10 lakh and six KVKs have closing balance in the range of Rs.1 to 4 lakh.

2.7 THRUST AREAS

Based on the agro-ecological situation, prevailing cropping & farming systems, KVKs are broadly working on the following 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 systems.
- Empowerment of women and youth in terms of improved nutrition, income generation and drudgery reduction through technology intervention.
- Scientific management of large ruminants, small ruminants and poultry.
- Promotion of horticulture as a mechanism of crop diversification and augmenting family income.
- Value addition, processing and market facilitation of household and commercial enterprises.
- Soil health management, soil & water conservation 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.
- Human resource development in fishery sector through training and capacity building.



ACHIEVEMENTS OF KRISHI VIGYAN KENDRAS

3.1 KRISHI VIGYAN KENDRAS

Achievements made by the KVKs during 2018-19 as per the mandate are presented under various heads and sub-heads in this chapter.

3.1.1 Technology Assessment

Technologies under crops, livestock and other enterprises are assessed for their suitability through the mandated activity of On Farm Testing (OFT). 47 KVKs of the zone, excluding the Lakshadweep KVK, conducted a total of 1098 trials to assess the performance of 467 technologies in 189 locations. State-wise details are given in Table 7.

Table 7: Summary of technology assessment conducted in Zone XI

States	Technologies (No.)	Trials (No.)	KVKs (No.)	Locations (No.)
Crops				
Karnataka	281	497	33	110
Kerala	136	304	14	46
	417	801		156
Livestock				
Karnataka	21	52	11	11
Kerala	16	54	10	10
	37	106		21
Enterprises				
Karnataka	7	177	8	8
Kerala	6	14	4	4
	13	191		12
Grand Total	467	1098		189

(A) Crops : On Farm Testing conducted in crops by the KVKs under 15 thematic areas under provided are in Table 8. In Karnataka 33 KVKs were involved in implementing the technology assessment through OFTs on all thematic areas. A total of 497 trials were laid out to test 281 technologies, out of which maximum of 121 technologies were related to Varietal Evaluation. Integrated Pest Management (36 technologies) and Integrated Nutrition Management (32 technologies) were the next important areas. In Kerala, 14 KVKs followed the similar trend in technology assessment with focus on Varietal Evaluation (33 technologies), Integrated Pest Management (31 technologies) and Integrated Nutrition Management (23 technologies), altogether laying out 304 trials to test 136 technologies spread across 12 theme areas.

Table 8: Technology assessment under crops in Zone XI

Sl. No.	Thematic areas	Karnataka				Kerala				Total			
		Technologies (No.)	Trials (No.)	KVKs (No.)	Locations (No.)	Technologies (No.)	Trials (No.)	KVKs (No.)	Locations (No.)	Technologies (No.)	Trials (No.)	KVKs (No.)	Locations (No.)
1	Integrated Nutrient Management	32	52	14	14	23	55	8	8	55	107	22	22
2	Varietal Evaluation	121	254	25	53	33	88	8	14	154	342	33	67
3	Integrated Pest Management	36	48	11	14	31	63	8	8	67	111	19	22
4	Integrated Crop Management	6	8	2	2	3	3	1	1	9	11	3	3
5	Integrated Disease Management	19	31	6	6	11	20	2	2	30	51	8	8
6	Small Scale Income Generation Enterprises	2	10	1	1	0	0	0	0	2	10	1	1
7	Weed Management	7	13	1	1	3	7	1	1	10	20	2	2
8	Seed / Plant production	3	3	1	1	3	1	1	1	6	4	2	2
9	Cropping systems	10	15	2	2	7	30	3	3	17	45	5	5
10	Mushroom cultivation	5	4	1	1	4	13	3	3	9	17	4	4
11	Crop diversification	3	5	1	1	0	0	0	0	3	5	1	1
12	Organic Cultivation	13	16	4	4	6	12	2	2	19	28	6	6
13	Inter cropping	16	23	5	7	0	0	0	0	16	23	5	7
14	Water Management	5	5	1	1	7	1	1	1	12	6	2	2
15	Farm Mechanization	3	10	2	2	5	11	2	2	8	21	4	4
	Total	281	497		110	136	304		46	417	801		156

(B) Livestock : Under Livestock and related enterprises a total of 37 technologies were tested in 106 trials. Feed and Fodder Management was the major thematic area under which 13 technologies were tested during the year.

Table 9: Technology assessment under livestock in Zone XI

Sl. No.	Thematic areas	Karnataka				Kerala				Total			
		Technologies (No.)	Trials (No.)	KVKs (No.)	Locations (No.)	Technologies (No.)	Trials (No.)	KVKs (No.)	Locations (No.)	Technologies (No.)	Trials (No.)	KVKs (No.)	Locations (No.)
1	Evaluation of Breeds	0	0	0	0	4	18	3	3	4	18	3	3
2	Feed and Fodder management	10	28	5	5	3	15	1	1	13	43	6	6
3	Nutrition Management	5	11	3	3	1	5	1	1	6	16	4	4



4	Production and Management	2	3	1	1	4	8	2	2	6	11	3	3
5	Fish Feeding Management	0	0	0	0	2	3	1	1	2	3	1	1
6	Breed Improvement	4	10	2	2	2	5	2	2	6	15	4	4
	Total	21	52		11	16	54		10	37	106		21

(C) Enterprises

Technology assessment under enterprises was taken up by 12 KVKs in which 13 technologies were tested through 191 On Farm Trials. Health and nutrition related technologies were tested by 4 KVKs whereas women and child care related technologies were tested in 3 KVKs.

Table10 : Technology assessment under enterprises in Zone XI

Sl. No.	Thematic areas	Karnataka				Kerala				Total			
		Tech-nologies (No.)	Trials (No.)	KVKs (No.)	Loca-tions (No.)	Tech-nologies (No.)	Trials (No.)	KVKs (No.)	Loca-tions (No.)	Tech-nologies (No.)	Trials (No.)	KVKs (No.)	Loca-tions (No.)
1	Health and nutrition	3	95	4	4					3	95	4	4
2	Processing value addition					3	8	2	2	3	8	2	2
3	Household food security	2	70	2	2					2	70	2	2
4	Organic farming					1	3	1	1	1	3	1	1
5	Women and child care	2	12	2	2	2	3	1	1	4	15	3	3
	Total	7	177		8	6	14		4	13	191		12

3.1.1.1 Location specificity of technologies under Crops

A. Varietal evaluation - Paddy

In the costal districts of Karnataka, paddy variety Shreyas (MO 22) performed better in Dakshina Kannada whereas Pratyasa (MO 21) performed better in Udupi district. Among all the varieties tested Pratyasa gave a higher economic benefits with a BC ratio of 2.31.

Table 11: Performance of paddy varieties in coastal districts of Karnataka

District	Kaje Jaya	Jyothi	MO22 Shreyas	MO 21 Pratyasa
Yield (q/ha)				
Dakshina Kannada	38.1	40.6	45.4	-
Udupi	36.43	37.14	40.98	42.13
BC Ratio				
Dakshina kannada	1.75	1.80	2.03	-
Udupi	1.99	2.03	2.25	2.31



Assessment of paddy varieties for coastal ecosystem in Dakshina Kannada district

B. Nutrient Management - Paddy

Under Kerala situations nutrient management in paddy was tested with the application of fine silica and lime in Calicut and Pathanamthitta districts (Table 12). The best yield was recorded in Pathanamthitta district although higher BC ratio was recorded in Calicut district. Application of fine silica along with lime proved to be a better technological option to increase yield and income from paddy cultivation.

Table 12: Assessment of nutrient management in paddy

KVK	Technological options	q/ha	Rs/ha	BC ratio
Calicut	FP	31.2	45250	1.81
	RDF + Fine Silica(100 kg/ha) + Lime (150 kg/ha)	37.5	65000	2.18
	RDF + PSB (3 kg / ha) + Lime (600 kg / ha)	35	58500	2.08
	FP	29.1	6095	1.09
Pathanamthitta	RDF+ additional K (75 kg/ha) +fine silica (100 kg ha)+lime (150kg/ha)+ FYM(5t/ha)	39.2	21530	1.29
	RDF+ PSB(3kg/ha) + Lime(600 kg/ha) + FYM(5t/ha)	32.8	11580	1.17

C. Varietal evaluation - Pigeonpea

Under pulses, Pigeonpea varieties were tested both in North Karnataka as well as South Karnataka. Among the varieties tested in North Karnataka, higher yield was recorded with variety GRG 811 (15.23 q/ha), followed by GRG 152 (14.78 q/ha) whereas in South Karnataka, BRG 2 recorded higher yield of 9.8 q/ha.

Table 13: Performance assessment of pigeonpea varieties in North and South Karnataka for yield

District	Yield (q/ha)			
	TS-3R	GRG-152	GRG-811	PRG-176
North Karnataka				
Kalburgi -I	8.23	10.06	10.1	4.93
Vijayapura-1	7.58	8.42	9.12	6.48
Vijayapura II	11.25	14.78	15.23	-
Belgavi-1	7.75	-	8.32	6.52(Gulyal local)
South Karnataka				
Banglore rural	8.8	9.8	9.4	8.6
Tumkuru-1	6.25	7.88	7.5	6.6

In terms of economic returns (Table 14) GRG 811 gave a BC ratio of 4.75 in Vijayapura district and BRG-2 gave a BC ratio of 2.22 in Bangalore Rural district.

Table 14:Performance assessment of pigeonpea varieties for income (BC ratio) in North and South Karnataka

District	TS-3R	GRG-152	GRG-811	PRG-176
Vijayapura-1	2.59	2.85	3.22	1.95
Vijayapura II	3.63	4.11	4.75	-
Belgavi-1	1.46	-	1.57	1.24 (Gulyal local)
	TS-3R	BRG-2	BRG-4	Ujwala
Banglore rural	2.03	2.22	2.13	1.98
Tumkuru-1	1.61	1.84	1.77	1.65



Performance of pigeonpea variety GRG-152 in Vijayapura district D. Varietal evaluation - Chickpea

Chickpea varieties were tested by 8 districts under different situations. Under irrigated situation, JG 14 gave higher yield of 18.58 q/ha whereas under rainfed situation BGD-103 gave higher yield of 17.2 q/ha (Table 15). With protective irrigation in Gadag district, BGD-111-01 gave higher yield of 16.52 q/ha. The economic performance of these varieties has depicted in Table 15 reveals that JG 14 gave higher BC ratio of 3.87 in Vijayapura district followed by variety 3.67 with variety NBeG 47 in Kalburgi district (Table 15).

Table 15: Assessment of chickpea varieties for yield (q/ha) under different farming situations

District	Situation	JG 11	JAKI-9218	Other alternatives
Bagalkot	Irrigated	13.50	16.33	18.58 (JG14)
Vijayaapura I	Irrigated	10.80		12.20 (JG14)
Belgavi	Rainfed	14.70	13.70	16.00 (NBe3)
Bellary	Rainfed	10.00	14.90	17.20 (BGD 103)
Kalburgi II	Rainfed	7.00		7.50 (NBeG 47)
Chamrajnagar	Residual soil moisture	8.61	10.62	-
Dharwad	Protective irrigation	14.93	15.63	13.47 (GBM-2)
Gadag	Protective irrigation	11.95	13.57	16.52 (BGD 111-01)

B:C				
District	Situation	JG 11	JAKI-9218	Other alternatives
Bagalkot	Irrigated	1.85	2.24	2.54 (JG-14)
Vijayaapura I	Irrigated	3.33	-	3.87 (JG-14)
Belgavi	Rainfed	2.4	2.2	2.60 (NBeG-3)
Bellary	Rainfed	2.04	3.05	3.51 (BGD 103)
Kalburgi II	Rainfed	3.55	-	3.67 (NBeG-47)
Chamrajnagar	Residual soil moisture	1.44	1.77	-
Dharwad	Protective irrigation	2.54	2.66	2.21 (GBM-2)
Gadag	Protective irrigation	2.08	2.33	2.75 (BGD-111-01)



Scientists interacting with farmers on performance of chick-pea variety in Gadag district

(E) Varietal evaluation - Groundnut

Groundnut varieties were tested in 3 districts. JL 1085 recorded high yield (25.3 q/ha) followed by 24.4 q/ha in GPBD-4, both in Dharwad district. However, BC ratio of 3.58 was recorded with G-252 during Kharif in Yadgir district (Table 16).

Table 16: Assessment of yield and economic returns of groundnut varieties under different situations

District	Farmers practice	GPBD-4	G2-52	Others
Yield (q/ha)				
Dharwad	19.5 (JL-24)	24.4	-	25.30 (JL-1085)
Vijayapura-II	15.24 (GKVK-5)	-	17.86	16.03 (K-9)
Yadgir (Rabi)	18.25 (TMV-2)	-	-	22.75(DH-86)
Yadgir (Kharif)	-	23.75	21.88	-
BC Ratio				
Dharwad	2.35 (JL-24)	2.94	-	3.05 (JL-1085)
Vijayapura-II	2.02(GKVK-5)	-	2.23	2.12 (K-9)
Yadgir (Rabi)	2.53	-	-	3.26 (DH-86)
Yadgir (Kharif)	-	3.09	3.58	-



Performance of groundnut variety G2-52 in Dharwad district

(F) Varietal evaluation - Onion: Onion varieties Arka Nikethan, Bhima Shakti, NHRD-28 red and Bhima Kiran were tested for yield and income (Table 17). Higher yield was recorded by Bhima Shakti (31.7 t/ha) in Davanagere district. In the same district Arka Nikethan gave next higher yield with 28.17 t/ha. However, in economic terms Arka Nikethan was superior (4.61 t/ha) in the same district.

Table 17: Assessment of onion varieties for yield and income in Karnataka

District	Farmers practice	Arka Nikethan	Bhima Shakti	NHRD-28 Red	Bhima Kiran
Yield (t/ha)					
Chitradurga	23.5(Satara Gurva)	25.20	24.3	22.1	
Davanagere	15.65 (Nyamathi local)	28.17	31.7	26.3	
Yadgir	11.00	16.30	-	-	18.0
BC Ratio					
Chitradurga	3.03(Satara Gurva)	3.25	3.13	2.85	-
Davangere	1.84 (Nyamathi local)	3.19	3.61	2.97	-
Yadgir	3.57(Local)	4.61	-	-	5.09



A view of the OFT Plot on onion varieties in Davanagere district

(G) Integrated Pest Management - Cabbage

Integrated Pest Management technologies were tested in 4 districts located around Bengaluru. Technological option of trap crop in cabbage, use of traps, spraying of Bt, neem, EPF and safe chemicals provided higher yield in all the districts as compared to that of farmers practice of using many chemical pesticides (Table 18). The IPM was also better for economic gains as evident with BC ratio of up to higher 5.28 in Ramnagara district and 4.4 in Bangalore Rural district.

Table 18: Management of cabbage diamond-back moth in the districts located around Bengaluru

Sl.	Technological options tested	Yield (t/ha)			
		Bangalore Rural	Chamarajanagara	Chikkaballapur	Ramanagara
T1	Farmers Practice: Use of chemical pesticides	38.7	37.25	36.71	34.76
T2	Intercropping with Mustard (25:2), Spray the crop with Dichlorvos (0.05%) and 5% NSKE	32.59	42.50	37.72	33.21
T3	Intercropping with Mustard (trap crop) (25:2), Installation of WOTA-T traps (DBM traps), Use of Sticky traps, Spray of Bt (6ml/l), Neem Soap (5g/l), Entomopathogenic fungi (<i>Beauveria bassiana</i>) (0.2%), Emamectin benzoate 5SG (0.05%), Chlorfenapyr 10SC (0.1%), Spinosad 2.5SC (0.15)%,	44.89	47.20	45.50	43.39
BC Ratio					
T1		3.11	3.13	1.90	3.56
T2		3.29	3.45	2.10	3.82
T3		4.44	3.60	2.40	5.28



Scientist showing the usefulness of IPM component in cabbage in Bengaluru Rural district

H. Intercrops - Mulberry

Different crops were tested as intercrops in tree mulberry system. The intercropping system of tree mulberry + field pea provided better economic returns with BC ratio of 5.5. It was marginally higher compared to sole crop of tree mulberry (Table 19). Over all combinations tested were significantly different from the sole crop system.

Table 19: Economic performance (BC ratio) of various intercrops with tree mulberry system in different districts

District	Tree Mulberry (sole crop)	BC Ratio of Main crop + intercrop			
		+ Finger millet	+ Groundnut	+ Field bean	+ Cowpea (KBC-1)
Chikkaballapur	3.50	2.40	3.20	3.40	-
Hassan	2.54	2.56	2.46	-	2.63
Kolar	5.11	3.92	4.34	5.55	-



A view of the sole crop of mulberry tree system in Kolar district



Mulberry intercropped with dolichos in Chikkaballapura district

I. Integrated Pest Management - Banana

Assessment of Biological Management Practices against Pseudo-stem weevil in Banana provided multiple technological option. Use of Nanma was found to be better in both Calicut and

Pathanamthitta districts (Table 20). As evident from the results incidence of weevil, 10.2% in Calicut and 8.57% in Pattanamthitta, also recorded higher yield of 22.25 t/ha and 19.4 t/ha respectively. Higher BC ratio was recorded in this technological option in both the districts.

Table 20: Assessment of biological management of psuedo-stem weevil in banana

KVK	Technological options	Yield q/ha	% incidence	BC ratio
Kozhikode	Nanma 5% on the pseudostem and leaf axil filling when the plants are at 5,6 and 7 month old stage	222.5	10.2	1.91
	Neem cake @50g/plant in the leaf axils of plants, when the plants are at 4 and 6 month old stage	184.25	19.4	1.69
	Metarrhizium anisopliae @ 20g/litre at 5,6 and 7 month old stage	206.75	13.2	1.87
	Beauveria bassiana @ 20g/litre at 5,6 and 7 month old stage	208.5	12.1	1.88
Pathana-mthitta	FP chlorpyrifos 0.03% followed by other chemicals	150.02	23.42	1.61
	Cadavers @ 4nos./plant in 5'th, 6'th and 7'th months .	173.7	12.68	1.31
	Nanma @ 12.5 lit/ha(in 250 L of water) in 4'th and 6'th months.	193.7	8.57	1.91



OFT on management of banana pseudostem weevil in Kozhikode district

3.1.1.2 Location specificity of technologies under Livestock and other enterprises

J. Breeds evaluation - Poultry

In Poultry, breeds of broiler type were tested in 3 district of Kerala viz. Wynad, Pathanamthitta and Idukki. Among the different breeds tested, Vencobb broiler recorded weight gain up to 2870 gms in Wynad district (Table 21). Similar performance of this breed was also noticed in the other districts as well. However, higher benefit cost ratio (1.83) was achieved by Gramasree breed when grown for meat purpose. Krishi Bro coloured broiler also provided higher BC ratio of 1.79. Gramasree breed was also found to be better in terms of higher feed conversion ratio (up to 2.75).

Table 21: Assessment of broiler varieties for augmenting Farmers income

KVK	Breeds	Wt gain (g)	BC ratio	Mortality (%)	FCR
Waynad	Vencobb broiler (42days)	2870	1.20	2.5	1.78
	Gramasree cockerels for meat (45 days)	604	1.83	2.5	2.75
	Gramasree cockerels for meat (60 days)	953	1.42	2.5	2.62
Pathanamthitta	Vencobb broiler (42days)	2500	1.16		1.583
	Krishi Bro coloured broiler (42days)	2300	1.79		1.585
Idukki	Gramasree (42days)	1440	1.46		
	BV 380 (42days)	2640	1.76		
	Kalinga brown (42days)	1440	1.41		



OFT on poultry breeds in Pathanamthitta district

(K) Varietal evaluation - Mushroom

Mushroom varieties were tested in 3 districts of Kerala viz. Kollam, Kottayam and Wynad (Table 22). *Pleurotus cystidiosus* gave higher yield of mushroom (2160 gms/bed). However, in terms of economics *Pleurotus florida* which is commonly grown and has better market acceptance recorded higher BC ratio of 4.64 in Kollam district.

Table 22: Assessment of mushroom varieties

KVK	<i>Pleurotus florida</i>	<i>Pleurotus eous</i>	<i>Hypsizygos ulmarius</i>	<i>Pleurotus cystidiosus</i>
Yield (g/bed)				
Kollam	850	682	798	-
Kottayam	775	500	700	-
Waynad	1260	1030	-	2160
BC Ratio				
Kollam	4.64	3.73	4.36	-
Kottayam	3.9	2.5	2.5	-
Waynad	1.15	0.94	-	1.41

3.1.2 Frontline Demonstrations (FLDs)

Frontline demonstrations on crops, livestock, fisheries, agriculture implements and other allied agriculture enterprises were taken up to demonstrate the production potential of newly released crop varieties, resource conservation technologies, crop production and protection technologies, improved technologies in livestock and fisheries and other allied activities. During 2018-19, 6080 frontline demonstrations were conducted including 1148 on cereals and millets, 136 on oilseeds, 755 on pulses, 192 on commercial crops, 70 on fibre crops, 196 on fodder

crops, 1024 on vegetable crops, 32 on tuber crops, 276 on fruit crops, 59 on flowers, 170 on plantation crops, 237 on spice and medicinal crops, 478 on hybrids of various crops. KVKs have conducted 30 demonstrations on agricultural farm implements, 625 demonstrations on livestock, 152 demonstrations on fisheries and 500 demonstrations on enterprises in the state of the Karnataka and Kerala (Table 23). Apart from this, 1008 demonstrations on crops, livestock and fisheries were under progress at different stages of implementation at the time of compilation of results.

Table 23: Details of state-wise frontline demonstrations conducted during 2018-19

Crop Category	Karnataka		Kerala		Grand Total	
	No.	Area(ha)	No.	Area(ha)	No.	Area(ha)
Cereals and millets	920	362.6	228	60.15	1148	422.75
Oilseeds	116	47.4	20	5	136	52.4
Pulses	690	268.5	65	16.14	755	284.64
Commercial crops	162	49.9	30	3.0	192	52.9
Fibre crops	70	28.0	0	0	70	28.0
Fodder Crops	174	43.4	22	6.5	196	49.9
Vegetable crops	670	201.85	354	14.89	1024	216.74
Tuber crops	0	0	32	2.88	32	2.88
Fruit crops	157	53.2	119	12.15	276	65.35
Flower crops	49	15.6	10	0.4	59	16.0
Plantation crops	110	44.0	60	27.0	170	71
Spices crops	100	33.0	129	21.76	229	54.76
Medicinal crops	0	0	8	0.13	8	0.13
Hybrids of crops	445	153.35	33	0.88	478	154.23
Farm implements	15	4.0	15	14.2	30	14.20
Livestock	394	0	231	0	625	0
Fisheries	71	0	81	0	152	0
Enterprises	202	110	298	146	500	256
Grand total	4345	1414.8	1735	331.08	6080	1741.88
FLDs under progress						
Crops	269	187.65	536	61.59	805	249.24
Livestock					139	
Fisheries					64	
Total					1008	249.24

3.1.2.1 Cereals and millets

A total of 1148 demonstrations were conducted on cereals and millets covering an area of 422.75 ha during the year by the KVKs in Karnataka and Kerala. The state wise break up includes 920 in Karnataka and 228 demonstrations in Kerala. The state wise results are presented in the foregoing discussions.

Karnataka: A total of 341 demonstrations in paddy, 77 in wheat, 22 in maize, 146 in sorghum, 147 in finger millet, 92 in foxtail millet, 50 in little millet, 10 in kodo millet and 15 in proso millet crops were conducted. These demonstrations covering an area of 362.6 ha in the farmers' fields during the year (Table 24). In paddy, technologies such as ICM, IPM, IPDM, IDM, organic cultivation, resources conservation seed production, mechanization, improved varieties and problematic soil management gave an average 54.85 q/ha i.e 11.89% increase in grain yield over local checks. The highest yield of 80.21q/ha was

recorded with GNV-10-90 variety and lowest was 23.46 q/ha under organic cultivation of Mugad Siri variety. In wheat, an average of 25.20 q/ha grain yield was recorded by DDK 1029 as compared to 13.50q/ha by DWR-162 under varietal demonstrations. The ICM technology in maize gave an increase of 13.51% (27.0 q/ha) in yield as compared to farmers practice (22.20 q/ha). In sorghum, SPV-2217gave 20.48 % higher in kharif as compared to 21.04% yield in rabi. Further, variety GS-23 also performed superior during kharif. In finger millet, KMR-340 variety gave 32.21% higher yield over farmers' practice. The higher BCR of 2.22 was obtained with ICM technology with yield of 11.35 q/ha in little millet. The processing and value addition technology in foxtail millet gave higher net returns of Rs. 26444/ha as compared to check (18701/ha). The kodo millet variety RK 390-25 has recorded 7.75 q/ha with 13.97% higher yield than farmers' practice. Similarly the proso millet with ICM gave 14.17 q/ha as compared to 11 q/ha in farmers' practices.



Table 24: Frontline demonstrations conducted by the KVKs of Karnataka on cereals and millet crops

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Demonstration		Check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Paddy	ICM	JGL Sona, KPR-1, MO-4, MGD-03	5	52	16.4	51.94	45.56	15.65	52511	2.36	36932	1.90
Paddy	Variety	GNV-10-90	3	30	12	80.21	69.11	17.09	94330	2.63	71109	2.16
Paddy	Variety	KKP-5	1	10	4	72.30	60.87	18.78	78902	2.69	61927	2.38
Paddy	Crop production	PSB-68, MTU-1001	2	20	8	70.45	57.62	23.00	69244	2.89	46742	2.12
Paddy	IPDM	Kaverisona, RNR 15048, BTP 5204, JGL 1798, Tunga	5	75	30	62.83	58.19	9.15	73336	2.7	57989	2.2
Paddy	Eco-friendly pest management	BPT-5204	1	10	4	50.11	48.33	3.68	42916	1.96	26437	1.45
Paddy	IDM	BPT-5204	2	20	8	57.47	52.10	9.93	50321	1.94	30110	1.47
Paddy	Mehanization	Jyothi, RNR 15048, BPT 5204	3	37	15	43.52	41.47	6.58	78104	3.13	63429	2.37
Paddy	Nutrient management	BR- 2655, BPT 5204	3	20	8	51.61	44.95	15.88	38310	1.79	26868	1.54
Paddy	Organic cultivation	Mugad Siri	1	10	4	23.46	26.00	-9.77	28420	2.54	21550	1.90
Paddy	Problematic soil management	Mo-4	1	10	4	43.21	39.10	10.51	16045	1.57	11955	1.46
Paddy	Resource conservation technologies	Mo-4,RNR 15048, BPT 1504	3	32	13	43.50	41.30	2.94	75534	2.82	61355	2.24
Paddy	Seed production	RNR 15048	1	15	6	62.50	47.66	31.14	101567	3.45	142833	4.33
				341	132.4	54.85	48.64	11.89	61503	2.50	50711	2.12
Maize	ICM	Local	1	7	2.8	27.00	22.50	20.00	30825	3.49	23625	3.33
Maize	Pest management (Fall worm)	Local	1	5	2	46.00	39.50	16.46	59335	2.34	46255	2.05
Maize+ Pigeon pea	Intercropping system	Maize: CP-848 Pigeon pea: TS-3R	1	10	4	32.52	22.17	46.68	15997	1.54	8139	1.36
				22	8.8	35.17	28.06	27.71	35386	2.46	26006	2.25
Sorghum	ICM	SPV- 2217	3	30	12	16.34	14.29	14.44	22826	2.57	18339	2.30



Sorghum	Moisture conservation	CSV-29R	1	15	6	11.19	9.73	15.01	17050	2.30	14434	2.13
Sorghum	IPM	SPV- 2217	2	15	6	11.48	9.38	20.48	19634	2.01	12977	1.80
Sorghum	Processing and Value addition	Phulemad-hur	1	10	4	5.00	2.00	150.00	0		0	
Sorghum	Variety	GS-23	1	12	5	15.50	12.50	24.00	27500	2.45	19000	2.03
Rabi Sorghum	Variety	SPV-2217	4	64	25.6	15.42	12.90	21.04	32115	3.05	24453	2.63
				146	58.6	12.49	10.13	40.83	19854	2.47	14867	2.18
Wheat	ICM	UAS-446, DDK 1029	5	50	18	31.63	27.47	15.05	54738	3.78	44440	3.42
Wheat	Variety	DDK-1029	1	10	4	25.20	22.20	13.51	21579	1.87	16013	1.64
Wheat	Variety	DWR-162	1	5	2	13.50	12.00	12.50	31850	3.81	27900	3.66
Wheat	Variety	UAS 304	1	12	5	24.00	19.50	23.08	50000	3.27	37500	2.79
				77	29	23.58	20.29	16.04	39542	3.18	31463	2.88
Finger millet	ICM	ML-365, KMR 340, GPU 67	5	65	26	18.25	15.16	17.63	28198	2.28	18600	1.82
Finger millet	Variety	ML – 365	3	57	22.8	21.14	17.27	22.51	38666	2.42	28164	2.09
Finger millet	Variety	KMR-340	1	10	4	44.62	33.75	32.21	86360	2.82	40625	1.93
Finger millet	Seed production	KMR 630	1	15	6	19.19	17.16	11.83	30796	2.10	6410	1.23
				147	58.8	25.80	20.83	21.04	46005	2.40	23450	1.77
Barnyard millet	Crop production	DHBM 93-3	1	10	4	13.20	10.70	23.36	20460	2.24	14110	1.89
Barnyard millet	Variety	DHBM 93-2	1	10	4	8.21	6.51	26.11	4156	1.25	851	1.06
				20	8	10.71	8.61	24.74	12308	1.75	7481	1.47
Foxtale millet	Processing & Value Addition	HMT-101, DHFt 109-3	3	37	15	16.87	12.59	32.03	26444	4.91	18701	4.04
Foxtail Millet	Variety	DHFt-109-3	3	30	12	11.70	9.42	23.49	13716	1.69	9108	1.51
Foxtail Millet	Variety	HMT-100-1	1	25	10	4.75	3.25	46.15	10500	2.62	8250	2.43
				92	37	11.11	8.42	33.89	16887	3.07	12020	2.66
Kodo Millet	Crop production	RK-390-25	1	10	4	7.75	6.80	13.97	7625	1.49	5200	1.34
Little millet	ICM	DHLM 36-3, OLM-203	6	50	20	11.35	9.25	23.71	17004	2.22	12286	1.95
Proso millet	Variety	DHBm-93-2	1	10	4	10.08	9.78	3.07	6556	1.42	5821	1.38
Proso millet	ICM	DHpm-2769	1	5	2	14.17	11.00	28.82	23565	2.46	15301	1.99
				15	6	12.13	10.39	15.94	15061	1.94	10561	1.68
Total				920	362.6							



FLD on Paddy Var. KKP-5-1 by KVK Shivamogga



Demonstration on Sorghum var. SPV-2217 by KVK Belagavi-I

Kerala: A total of 213 demonstrations in paddy covering an area of 56.15 ha were conducted in farmers' fields during the year (Table 25). The technologies such as IPM, ICM, IDM, IDPM, HYV, weed management, wet land ecosystem management and new varieties like Shreyas and Akshaya gave an average 30.69 % increase in yield as compared to farmers' practice. The yield was higher in

wetland ecosystem management with 85 q/ha followed by Akshaya variety (68.75 q/ha) and other high yielding varieties (66.21q/ha) as compared to farmers' varieties (Table 25). The Akshaya variety under varietal evaluation recorded higher returns of 111938 Rs/ha. In finger millet variety KMR-301 gave 18.08q/ha with net returns of Rs 29680/ha.

Table 25: Frontline demonstrations on cereals during 2018-19 in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Paddy	ICM	Vaishak	1	20	1	14.85	8.35	77.84	16416	1.51	3578	1.16
Paddy	Organic farming	Uma	1	5	1	58.00	55.00	5.45	83000	2.30	67000	1.93
Paddy	Varietal demonstration	Shreyas	2	20	10	49.60	40.90	20.40	52994	1.86	31881	1.51
Paddy	High yielding varieties	Manurathna	1	10	1.2	66.21	54.80	20.82	84846	1.92	57091	1.62
Paddy	Varaital demonstration	Akshaya	1	20	4	68.75	53.40	28.75	111938	2.81	73102	2.18
Paddy	IPDM	Uma, Thriveni	2	15	2.75	41.99	33.28	27.30	46364	1.79	23098	1.42
Paddy	IDM	Jyothi, Uma	1	16	4	51.66	42.86	20.53	71070	2.19	51286	1.90
Paddy	Weed management	Uma, Jyothi	4	45	10.2	58.87	51.95	14.98	85735	2.39	61156	1.92
Paddy	Bio intensive pest and disease management	Uma	1	5	2	62.85	47.30	32.87	572324	1.71	251616	1.32
Paddy	Drought management	Uma, Jaya	3	22	8	41.82	34.57	19.76	39368	1.59	24421	1.39
Paddy	INM	Manurathna	1	10	2	55.50	57.10	-2.80	83547	2.30	82405	2.16



Paddy	Wet land ecosystem management	Sreyas, Man-uprabha, Uma	1	25	10	85.00	42.00	102.38	101100	2.84	35860	1.58
				213	56.15	54.59	43.46	30.69	112392	2.10	63541	1.67
Finger millet	Varaital evaluation	KMR 301	1	15	4	18.08	15.58	16.05	29680	2.91	22650	2.39
				228	60.15							



Demonstration in upland paddy by KVK Alappuzha

3.1.2.2 Oilseeds

During the year 136 demonstrations were conducted by KVKs of Karnataka and Kerala on groundnut and

sesamum in an area of 52.40 ha in farmers' fields. The state wise and crop-wise results are presented in the forgoing discussion.

Karnataka: 100 demonstrations in groundnut, 16 in sesamum were conducted by KVKs of Karnataka under oilseeds covering area of 92.4 ha in farmers' fields (Table 26). Groundnut G2-52 and GKVK-5 performed better as compared to farmers' practice. The highest yield of 27.75 q/ha was recorded by variety G2-52, is 6.12% higher than the farmers local variety (26 q/ha). Sesamum variety GT-1 recorded higher yield and BCR (4.10 q/ha and 2.18, respectively) as compared to farmers practice (4.0 q/ha and 1.63, respectively).

Table 26: Frontline demonstration on oilseeds conducted in the state of Karnataka

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics \ of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Groundnut	ICM	TMV-2, G2-52, Dh-245, ICGV 91114	5	45	18	14.56	12.29	19.40	53318	2.41	40968	2.10
Groundnut	Mechanization	GKVK-5	1	10	4	24.40	23.30	4.72	74482	2.75	58715	2.11
Groundnut	INM	GPBD-4	1	20	8	14.76	13.50	9.33	36550	2.62	32000	2.45
Groundnut	Varietal demonstration	K-6	1	5	5	6.88	4.52	52.21	20906	2.55	11304	2.00
Groundnut	Variety introduction	G2-52	1	10	4	26.00	24.50	6.12	105210	5.24	97710	4.94
Groundnut + Pigeon pea	Intercropping Groundnut + Pigeon pea	GKVK-5, BRG-5	1	10	2	13.60	8.76	55.25	29924	1.85	14060	1.50
				100	86	16.70	14.48	24.51	53398	2.90	42460	2.52
Sesamum	Protective irrigation summer	GT-1	1	6	2.4	2.52	2.00	26.00	14900	2.45	10983	2.21
Sesamum	Variety introduction	GT-1	1	10	4	4.10	4.00	2.50	20010	2.18	10000	1.63
				16	6.4	3.31	3.00	14.25	17455	2.32	10492	1.92
Total				116	47.4							



FLD on Groundnut by KVK Belagavi

Kerala: In rice fallows, 20 demonstrations on sesameum were conducted covering an area of 5 ha in the state of Kerala. The variety Thilarani (4.38 q/ha) recorded higher yield as compared to farmers' local check (Table 27).

Table 27: Frontline demonstrations on oilseeds conducted in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Sesamum	High yielding varieties	Thilarani	1	20	5	4.38	3.38	29.59	54405	1.99	27259	1.48



FLD on Sesamum by KVK Alappuza

Karnataka: Demonstrations on pulses included 189 in chickpea, 83 in blackgram, 50 each in greengram, 280 pigeon pea, 27 in soyabean, 20 in cowpea besides 41 in paddy and clusterbean were organized by KVKs of Karnataka covering an area of 268.5 ha (Table 28).

The technologies such as ICM, disease management, resource conservation and micronutrient management were demonstrated in black gram. Among these technologies micronutrient management with DU-1 variety has recorded 9.15 q/ha, which was followed by 8.61 q/ha under resource conservation with variety Rashmi. In greengram, varietal demonstrations and ICM gave an increase of 28.30% over farmers' practice. In pigeon pea, overall yield increase due to soil nutrient management demonstration was 20.46% over local check. The TS-3R under varietal evaluation with 12.73 q/ha and ICM with 11.22 q/ha) were superior over farmers' practice in pigeon pea. The varietal demonstration on DC-15 in cowpea has recorded 17.47 q/ha with BCR of 2.18. In soybean, demonstration of DSB-21, gave 17.56q/ha. During rabi season, ICM technology in chickpea gave an average yield of 22.31q/ha, which is 19.16% higher over their local check. The next best yield of 20.75q/ha was recorded in variety JAKI -9218 followed by 13.35q/ha in IPM technology.

3.1.2.3 Pulses

A total of 755 demonstrations were undertaken on pulses in 284.64 ha area of farmers' fields by the KVKs in Karnataka and Kerala states under ATARI, Zone-XI during 2018-19. The state wise and technology wise results are presented in the foregoing discussion.



Table 28: Frontline demonstrations on pulses conducted in the state of Karnataka

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	*Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Blackgram	ICM	Rashmi, DU-1	2	58	23.0	7.85	7.14	10.31	9447	1.70	12044	1.84
Black gram	Disease Management	Rashmi	1	10	4.0	8.60	7.18	19.78	28500	2.23	19250	1.81
Black gram	Resource conservation	Rashmi (LBG-625)	1	10	4.0	8.61	7.37	16.82	26297	2.41	18015	2.00
Blackgram	Micro nutrient management	DU-1	1	5	2.0	9.15	7.10	28.87	29500	2.82	20750	2.41
				83	33.0	8.55	7.20	18.95	23436	2.29	17515	2.01
Greengram	ICM	BGS-9, KKM-3	4	40	14.0	6.76	8.13	8.33	7261	2.51	9210	2.51
Greengram	Variety	DGGV-2	1	5	2.0	8.37	6.71	24.74	18894	1.67	10878	1.41
Greengram	Variety	KKM-3	1	5	2.0	6.80	5.30	28.30	19316	2.31	13294	2.02
				50	18.0	7.31	6.71	20.46	15157	2.16	11127	1.98
Chickpea	ICM	JAKI-9218, GBM-2	7	142	60.0	22.31	18.79	19.16	38788	2.85	24846	2.27
Chickpea	Cropping system	BGD-103 + PKVNL 260	1	10	4.0	8.75	8.00	9.38	33550	3.72	31300	3.93
Chickpea	Disease management	BGD-103	1	10	4.0	6.00	5.25	14.29	27500	2.90	17750	2.34
Chickpea	INM	Jakie-9218	1	10	4.0	12.00	9.50	26.32	35250	2.12	23055	1.78
Chickpea	Plant Protection	BGD-103	1	12	5.0	13.35	10.91	22.36	34060	3.43	26100	2.98
Chickpea	Variety	JAKI-9218	1	5	2.0	20.75	17.20	20.64	62021	2.98	48682	2.70
				189	79.0	13.86	11.61	18.69	38528	3.00	28622	2.66
Cluster Bean	ICM	PUSA Noubahar	1	10	2.0	42.60	38.20	11.52	64774	1.81	49897	1.77
Cowpea	Variety	DC-15	1	10	4.0	17.47	12.25	42.61	39664	2.18	17740	1.53
Cowpea	Cropping system	KBC-9	1	10	4.0	5.23			9522	1.68		
				20	8.0	11.35	12.25	42.61	24593	1.93	17740	1.53
Paddy bean	ICM	KBR-1, RBL	3	31	10.5	9.07	7.42	5.77	19583	2.13	19815	2.52



Pigeon pea	ICM	GRG-811, TS-3R, BRG-5, BSMR 736, BRG-1	9	193	79.0	11.22	9.36	20.26	61649	3.16	46583	2.73
Pigeonpea	Variety	TS-3R	1	5	2.0	12.73	9.73	30.83	31748	2.27	23920	2.05
Pigeonpea	Variety	BRG-5	1	30	5.0	7.44	6.99	6.44	25645	1.76	12935	1.37
Pigeonpea	Disease management	GRG-811	1	10	4.0	6.21	5.28	17.61	14293	1.72	9308	1.47
Pigeonpea	Weed management	TS-3R	1	12	5.0	11.12	9.75	14.05	44500	3.31	38250	2.89
Pigeonpea	Soil Nutrient management	GRG-811	1	5	2.0	16.82	11.78	42.78	78727	4.30	50308	3.33
Pigeonpea	Cropping millets in Pigeon pea	TS3R & SIA 2644	3	25	10.0	9.97	9.88	1.69	46707	3.85	40056	3.52
				280	107.0	10.79	8.97	19.10	43324	2.91	31623	2.48
Soyabean	Nutrient management	DSB-21	1	5	2.0	17.30	12.75	35.69	38050	2.69	26125	2.41
Soyabean	Crop Production	DSB-21, JS 335	2	22	9.0	17.82	15.96	12.76	28564	2.02	22544	1.79
				27	11.0	17.56	14.36	24.22	33307	2.35	24335	2.10
				690	268.5							

Kerala: A total of 65 demonstrations were conducted in blackgram during the year by 4 KVKs of Kerala state in an area of 16.14 ha (Table 29). Vamban 8 variety of blackgram recorded highest yield of 12.50 q/ha with BCR of 3.67 over other varieties. The other varieties BGS-9 gave 11 q/ha with net returns of Rs 30800/ha.

Table 29: Frontline demonstrations on pulses conducted in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Black gram	Variety	VBN-8	2	17	1.14	5.69	0.00		23067	1.51		
Black gram	Variety	VBN-8	1	20	5.00	11.00	7.00	57.14	30800	3.57	14500	2.45
Black gram	Variety	BGS9	1	28	10.00	12.50	6.50	92.31	32000	3.67	9500	1.95
				65	16.14	9.73	4.50	74.73	28622	2.91	12000	2.20

3.1.2.4 Commercial crops

A total of 192 demonstrations were organized on major commercial crops covering an area of 52.90 ha during the year by the KVKs of Karnataka and Kerala. The technology wise results are presented below:

Karnataka: Demonstrations were conducted in commercial crops like sugarcane, mulberry and betelvine during 2018-19 in the state of Karnataka (Table 30).

In sugarcane, technologies like ICM, pest management, and IPM, insitu vermiculture, micro nutrient application, intercropping and new variety have been demonstrated



in the farmers' field. A yield of 1750 q/ha and BCR of 2.84 has been recorded in the intercropped demonstration plots. Whereas new variety could give 1362q/ha with an average increase of 28.25 % in yield as compare to farmers' practice. Micronutrient application in sugarcane gave 1354 q/ha cane yield as compared to 1280q/ha in farmers' practice. Mulberry leaf yield increased by 78.69 % due to ICM technology as compared to local check.

Silk worm rearing gave an average cocoon yield of 69.95 kg/100 DFLs under demonstrations leading to higher net returns of Rs. 555150/100 DFLs rearing as compared to Rs. 112448/100 DFLs in farmers' practice. In betel vine the ICM technology demonstration gave 2708034 leaves/ha recording 20.45% higher yield as compared to farmers' practice. The net returns and BCR were Rs. 650334/ha and 4.90, respectively.

Table 30: Frontline demonstrations on commercial crops conducted in the state of Karnataka

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Betal vine	ICM	Local	2	20	8.0	2708034	22478655	20.45	650334	4.90	500604	3.93
Mulberry	ICM	V-1	4	41	11.0	400.30	335.23	78.69	149838	3.22	137381	3.48
Silkworm (kg/100dffs)	IPM	CSR-2	4	35	11.4	69.95	62.28	12.94	555150	2.57	112448	7.60
Sugarcane	ICM	Co-86032	1	5	2.0	1201.00	1115.00	7.71	216250	3.57	185450	2.99
Sugarcane	Intercropping	Co VC-517	1	10	2.0	1750.00	1715.00	2.04	280000	2.84	203000	2.45
Sugarcane	Pest management	Co-86032	2	30	7.0	1110.05	982.00	12.39	188259	3.14	95309	1.84
Sugarcane	In situ vermiculture	Co-86032	1	10	4.0	1257.60	1101.80	14.14	143358	1.98	111094	1.78
Sugarcane	Micronutrient application	Co-86032	1	10	4.0	1354.00	1280.00	5.78	157705	2.03	143685	1.95
Sugarcane	New variety	SNK-07680	1	1	0.5	1362.00	1062.00	28.25	162545	2.08	126455	0.16
				66	19.5	1339.11	1209.30	11.72	191353	2.61	102014	1.86
				162	49.9							



Management of sugarcane root aphid by KVK chikkamagaluru

Kerala: 30 Demonstrations were conducted in commercial crops like sugarcane and betelvine during 2018-19 in the state of Kerala (Table 31).

In sugarcane, technologies like mechanization has been demonstrated in the farmers' field led to net returns of Rs 47000 /ha with yield of 100 q/ha and BCR of 1.35 as compared to negative returns under farmers practise. In betel vine the eco friendly disease management technology gave leaf yield of 182 lakh/ha recording 2.59 % higher yield as compared to farmers' practice. The net return and BCR were Rs. 2791250/ha and 2.59, respectively.

Table31: Frontline demonstrations on commercial crops conducted in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Betelvine	Ecofriendly disease management	Local	1	20	1	182 lakh	56 lakh	225	2791250	2.59	457500	1.40
Sugarcane	Mechanization	Madhuri	1	10	2	100.00	100.00	0.00	47000	1.35	-20000	0.90
				30	3							

3.1.2.5 Fibre crops

Demonstrations on cotton were organized by KVKs in Karnataka covering 28 ha area. The technology wise results are discussed below:

Karnataka: Ten demonstrations each on IPDM, varietal evaluation and management of leaf reddening in cotton

covering 4 ha each and 40 demonstrations on Bt cotton with IPM technology were conducted (Table 32). The seed cotton yield was 26.13 q/ha in IPM with BGDS1063 as compared to farmers' practice. This was followed by 23.82 q/ha in leaf reddening management technology and 21.47 q/ha in IPDM demonstrations.

Table 32: Frontline demonstrations on fibre crops conducted in the state of Karnataka

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Bt. Cotton	Management of Leaf reddening	Pvt Hybrid	1	10	4	23.82	19.73	20.73	110927	4.23	87593	3.67
Cotton	Varietal evaluation	BGDS 1063	1	10	4	26.13	23.66	10.44	87717	2.64	69120	2.18
Cotton	IPDM	Kanaka & Niraja	1	10	4	13.74	11.23	22.35	18894	1.67	10878	1.41
Cotton	IPM	Bt cotton	3	40	16	21.47	17.84	23.73	167883	5.35	60892	2.64
				70	28	21.29	18.11	19.31	96355	3.47	57121	2.48



IPM in Cotton by KVK Yadgir

3.1.2.6 Fodder crops

During the year, 196 demonstrations were conducted on the production of fodder in 49.9 ha area in the states of Karnataka and Kerala. The state wise and technology wise results are presented below:

Karnataka: A total of 174 demonstrations were conducted on fodder crops covering an area of 43.4 ha by KVKs in the state of Karnataka during the year (Table 33). The technologies like cultivation of improved varieties of fodder such as CoFS-29, CoFS -31 and RL-88, besides crop cafeteria, ICM, mixed cropping and preservation of green fodder were implemented. CoFS-31 and BG-2 gave higher green fodder yield than the local fodder varieties. The fodder cafeteria demonstrations gave 325.45 q/ha nutritious green fodder with net returns of Rs. 81774 /ha.

Table 33: Frontline demonstrations on fodder crops conducted in the state of Karnataka

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Fodder	Mixed cropping fodder	COFs-31, Stylosanthushaemata	1	9	0.9	1240	430	188.37	207475	2.25	134200	1.69
Fodder	ICM	BG-2	1	10	1.0	5820	4860	19.75	27840	1.66	11830	1.25
Fodder	ICM	CoFS 31	1	10	1.0	14200	9300	52.69	100400	2.80	65100	2.40
Fodder	Fodder cafeteria	Guinea grass, Lucerne), Drumstick (Bhagya), Sesbania (Rostrata)	3	15.0	3.5	325.45			81774	2.23		
Fodder	Improved varieties	COFS 31	5	70	17.0	1496.60	843.00	90.65	167078	4.3	78490	3.28
Fodder	Improved varieties	CoFS-29	5	40	12.0	1371.40	570.25	26.26	89167	3.26	44397	2.58
Fodder	Varietal demonstration	Anand-2/RL-88	1	10	4.0	715.00	425.00	68.24	48600	2.74	38400	2.41
Fodder	Preservation of green fodder preservation	Silage	1	10	4.0				4050	1.70	1675	1.26
				174	43.4							



Silage preparation by KVK Mudigere

Kerala: A total of 22 demonstrations were organized by 4 KVKs of Kerala state on fodder production technology covering an area of 6.5 ha during the year (Table 34). The results indicated an increased quality fodder yield to the extent of 27.93% in Co(GG) 3 with an average green fodder yield of 2835 q/ha over their local check (2216 q/ha).

Table 34: Frontline demonstrations on fodder crops conducted in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Fodder	Varietal demonstration	DHN6	1	10	5	1294	1236	4.69	89400	3.24	83600	3.09
Fodder	Hydroponics	AF tall maize	1	1	0	15075	0.00		339050	2.42	0	
Fodder	Quality fodder production	CO(GG)3	1	10	1	2835	2216	27.93	442200	2.66	297450	2.16
Fodder maize	Fodder	Fodder maize	1	1	0.5	600	400	50.00	105900	2.41	60600	2.01
				22	6.5							



Hydroponics fodder production by KVK Waynad



Fodder crop management by KVK Kasargod

3.1.2.7 Vegetable crops

Vegetable crops such as brinjal, cabbage, capsicum, cauliflower, chilli, cucumber, cluster bean, field bean, french bean, onion, tomato, garden pea, ridge gourd, bhendi, greens, yard long bean, watermelon and muskmelon were demonstrated with improved technologies under 1024 farmers' fields covering an area of 216.74 ha by the KVKs of Karnataka and Kerala states. The state wise and technology wise results are presented below:

Karnataka: A total of 670 demonstrations were conducted in major vegetables covering an area of 201.85 ha by the KVKs of Karnataka state during 2018-19 (Table 35).

In bhendi, demonstration of Phule vimukta, Mattigulla recorded an average yield of 246.78q/ha (16.22% increased yield) as compared their local check (135.13 q/ha). The INM demonstration in brinjal has given higher yield of 338.05 q/ha with BCR of 2.71 as compared to 285.55 q/ha under farmers' practice. ICM in cabbage recorded an average yield of 348.50 q/ha with BCR of 2.16. In Capsicum, Precision farming technology gave 861.50 q/ha leading to 9.05% increase in yield over their local check. Similarly, IPM in cauliflower gave an average yield of 199.50 q/ha as compared to local check with only 167 q/ha. ICM demonstration in chilli variety Sitara and nematode management in chilli also gave 39.91% and 21.52% increased yield over their local checks, respectively. In chilli, variety Arka kyati demonstration gave an average 195 q/ha over farmers' practice (86 q/ha). INM in cucumber has given yield of 540q/ha with BCR of 3.85 as compared to 520 q/ha in farmers practice of cultivation.

Whereas, IPM and IPDM in cucumber gave 233 q/ha and 90.60 q/ha yield respectively over their check (164 q/ha) and 73 q/ha in farmers practice. Varietal demonstration of Arka Sharath in french bean gave higher yield of 167.30 Q/ha, which is 18.48% higher than the local check. In Yard long bean Varietal demonstration of Arka Mangala gave an increased yield of 211.60 q/ha over local variety 161.30 q/ha. Similarly, IPM in field bean gave higher yield to the extent of 7.27 q/ha as compared to 6.21q/ha in farmers practice. In onion, IPDM, ICM, nutrient management and Varietal demonstration (Bheema Kiran, Arka kalyan and Bheema super) technologies were demonstrated through 145 farmers' fields. All the technologies gave higher yield ranging from 6.77% to 45.56% higher yield over farmer practise. ICM practice has given yield of 331.76 q/ha with BCR of 3.82 in onion as compared to 285.36 q/ha in the farmers practice. IPM, ICM and Varietal demonstration technologies demonstrated in ridge gourd gave higher yield of 183 q/ha, which is 37% higher over their check. In tomato, ICM, INM, IPM, micronutrient management and vegetable special technologies were demonstrated in 130 farmers field recorded an increased yield of 484 q/ha as compared to 389q/ha in farmers practise. ICM and nutrient management technologies demonstrated in watermelon has given increased yield of 465 q/ha which is 30.69% and 8.62% higher compared to local check. In Muskmelon, demonstration on pest management gave higher yield of 36.30 q/ha as compared over check of 25.41q/ha. The nutrition garden demonstrated in schools by KVKs through 87 demonstrations gave an average vegetable yield of 326.57 q/ha per annum.



Table35: Frontline demonstrations on vegetables crops conducted in the state of Karnataka

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Bhendi	ICM	PhuleVimukta, Mattigulla	2	20	2.8	155.50	135.13	14.12	178718	2.91	138800	2.53
Brinjal	INM	Arka Harshitha	2	15	5	338.05	285.55	18.32	124616	2.71	90100	2.26
			4	35	7.8	246.78	210.34	16.22	151667	2.81	114450	2.39
Cabbage	ICM	Unnathi	1	10	2	348.50	343.70	1.40	93615	2.16	75394	1.78
Capsicum	Precision farming	Aisha, Wisdom	1	3	0.3	861.50	790.00	9.05	1123385	7.65	993180	6.18
Cauliflower	IPM	Private company	1	10	4	199.50	167.00	19.46	364140	7.17	296570	6.14
Chilli	ICM	Shitara	1	5	4	382.80	273.60	39.91	374880	5.44	252388	4.32
Chilli	Variety demonstration	Arka Kyathi	1	20	8	195.00	86.00	55.89	105628	2.53	8315	1.21
Chilli	Nematode management	Local	1	10	2	192.00	158.00	21.52	299000	4.52	121600	2.38
				35.0	14.0	256.60	172.5	39.11	259836	4.16	127434	2.64
Cucumber	Varietal demonstration	Belgavi Local	1	10	2	282.00	170.00	65.88	187000	3.75	163600	3.64
Cucumber	IPDM	Bhagamandala Local	1	10	2	90.60	73.00	24.11	89855	2.23	62060	1.90
Cucumber	IPM	Private company	1	10	4	233.00	164.00	42.32	137529	3.79	73302	2.27
Cucumber	INM	Local	1	10	4	540.00	520.00	3.85	29998	2.06	16018	1.66
				40	12	286.40	231.75	34.04	111096	2.96	78745	2.37
French bean	ICM	Arka Arjun	2	13	2.6	133.40	112.15	20.62	168234	3.63	156007	3.82
French bean	Organic farming	Arka Suvidha	1	5	1	105.10	85.30	23.21	81034	3.24	122918	4.71
French bean	Varietal demonstration	Arka Sharath	1	10	2	167.30	141.20	18.48	236370	3.41	185607	2.92
French bean	French bean in arecanut	Arka Sharath	1	10	2	102.44	87.02	17.72	78558	2.77	59684	2.33
French bean	Varietal demonstration	Arka Arjun	1	10	4	134.10	107.60	24.63	109925	3.15	70098	2.19
				48	11.6	128.47	106.6	20.93	134824	3.24	118863	3.19
Yard long Bean	Varietal demonstration	Arka Mangala	1	10	2	211.60	161.30	31.18	303140	3.53	207650	2.81
Nutrition garden	Nutritional garden	Mixed vegetables	10	87	5.15	326.57			194425	2.23		
Onion	ICM	Bhima Super, Bheema Shakti	10	70.0	27.0	331.76	285.36	20.19	184472	3.82	134804	3.08
Onion (Rabi)	Crop production	Bhima Shakti	1	5	2	305.00	275.00	10.91	209750	3.62	160000	2.83
Onion	Varietal demonstration	Bhima Super	3	15	6	209.93	170.85	23.12	126139	3.24	88108	2.56
Onion	Varietal demonstration	Arka Kalyan	1	25	10	244.10	200.90	21.50	6103	1.26	2385	1.11
Onion	Variety introduction	Bhima Kiran	1	5	1	262.00	180.00	45.56	81000	2.62	32000	1.55
Onion	IPDM	Thealagi white, Ballary red	2	10	4	154.47	136.33	14.20	76179	2.68	59475	2.27
Onion	Nutrient management	Raj onion	1	10	4	169.52	146.10	16.03	160607	3.09	133140	2.86



Small Onion	ICM	CO-5	1	5	2	86.70	81.20	6.77	141875	2.89	115450	2.32
				145.0	56.0	220	184	20	123265	3	90670	2
Greens	Varietal demonstration	Arka Anupama	1	10	4	253.60	96.00	164.17	179660	3.43	27550	1.40
Avare	IPM	Local	1	15	6	7.27	6.21	17.07	51500	2.52	36754	2.01
Pea	ICM	Pvt variety	1	10	2	69.12	68.77	0.51	949883	11.92	925475	9.73
Ridge gourd	IPM	Saniya	2	15	6	78.85	60.50	34.18	74352	2.75	42277	1.94
Ridge gourd	ICM	ArkaPrasanna	1	15	1	226.13	186.50	21.25	112267	2.23	78196	1.87
Ridge gourd	Varietal demonstration	ArkaPrasanna	1	5	2	242.70	154.80	56.78	204922	3.37	114180	2.44
Tomato	ICM	US800, US 440, Arka Rakshak, Arka Samrat	6	55	21	536.50	398.08	43.31	397116	5.04	214420	3.29
Tomato	Varietal demonstration	Arka Rakshak	1	5	2	558.00	343.40	62.49	397200	3.47	210600	2.59
Tomato	IPM	US Agri, Pvt hybrids	3	40	16	362.47	321.50	15.32	172507	3.09	138537	2.64
Tomato	INM	ArkaRakshak, DMT-2	2	10	3	646.45	542.00	18.47	154374	2.98	125807	2.72
Tomato	Micro nutrient management	Pvt variety	1	10	2	532.70	488.50	9.05	352760	5.81	315600	5.20
Tomato	Vegetable Special	Shankar	1	10	4	268.00	238.00	12.61	216800	5.25	183700	4.40
				130	48	484	389	27	281793	4	198111	3
Muskmelon	Pest management	Local	1	5	1	36.30	25.41	42.86	484070	4.20	244684	3.85
Watermelon	ICM	Sugar Star, Namadhari	3	27	11	300.00	209.10	30.69	241917	3.41	1002500	11.6
Watermelon	Nutrient management	Sugar queen	1	15	6	630.00	580.00	8.62	402750	4.98	334875	4.34
				42	17	465	395	20	322333	4	668688	8
				670	201.85							



Chilli demonstration by KVK Tumkur-I



ICM demonstration in Tomato by KVK Davanagere



Kerala: A total of 354 demonstrations were implemented in vegetable crops like amaranthus, ashgourd, bhindi, bitter gourd, brinjal, baby corn, chilli, cowpea, cucumber, lettuce, milky mushroom, tomato, winged bean and nutrition garden covering an area of 14.89 ha mostly in the homestead farming situation (Table 36).

Amaranthus with IPM and varietal evaluation demonstrations in 25 farmers' fields gave a yield of 206 q/ha green leaf with BCR of 4. Integrated farming system was demonstrated in baby corn recorded net returns of Rs 39250/ha and BCR of 1.60. Disease management in ashgourd showed increased yield of 18.11% over the check. Similarly, IPDM in brinjal has given 225 q/ha leading to 38.04% higher yield than the local check. In bitter gourd, IPDM performed superior to farmers' practice and recorded 38.04 % increased yield over check. INM, precision farming, varietal evaluation technologies in

chilli led to 27.42%, 62.50% and 34.78% increased yield over check, respectively. Bio intensive pest and disease management in Arka Mangala variety of cowpea gave 217.89 q/ha yield as compared to only 186.79 q/ha over farmers' practice. The high-tech cultivation of okra variety Salkeerti has given 220q/ha over check yield of 170q/ha. The organic production technology in lettuce gave 85q/ha with BCR of 1.66. The tomato performed superior with INM, Micronutrient deficiency, ICM, Varietal evaluation production and management demonstrations. Among these INM and ICM practices resulted in 325q/ha and 281.25 q/ha yield, respectively. The varietal evaluation in winged bean recorded 25 q/ha as compared to 17 q/ha in farmers' check. The Milky mushroom variety Bheema gave 1.37 kg/bed as compared to farmers' variety with only 1.25kg/bed. The nutritional security among farm families was demonstrated among 75 farmers and obtained net returns of Rs 67658/ha and BC ratio of 2.21.

Table 36: Frontline demonstrations on vegetables conducted in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Amaranth	Varietal evaluation	Amt 1	1	5	0.06	250.00	200.00	25.00	365000	2.40	260000	2.08
Amaranthus	IPM	Arun	1	20	0.08	161.40	119.90	34.61	379219	4.61	251279	3.28
				25	0.14	206	160	30	372110	4	255640	3
Ashgourd	Disease management	Local	1	10	2	150.00	127.00	18.11	106328	1.90	77708	1.68
Baby corn	Integrated farming system	G5414	2	13	1.4	69.60	0.00		39250	1.60		
Bhendi	IPM	Manjima	1	10	0.2	154.22	90.90	69.66	320940	2.47	111921	1.52
Bhendi	Precision farming	Samrat	1	3	0.12	181.00	116.00	56.03	241500	1.80	59500	1.21
				13	0.32	167.61	103.45	62.85	281220	2.13	85711	1.36
Bittergourd	IPDM	Preethi	2	15	0.4	111.88	77.05	62.53	266784	2.32	123022	1.68
Brinjal	IPDM	MHYCO-Long green	1	5	0.01	225.00	163.00	38.04	66000	1.24	18000	1.08
Brinjal	IPM	Local, Haritha	2	21	0.7	225.77	176.70	32.78	311718	3.13	197441	2.35
				26	0.71	225.38	169.85	35.41	188859	2.19	107721	1.71
Chilli	Varietal evaluation	Arka Harita	1	5	0.06	310.00	230.00	34.78	395000	2.04	255000	1.80
Chilli	Precision farming	Serra	1	3	0.04	117.00	87.20	62.50	60805	1.95	65351	1.26
Chilli	INM	Ujwala, Anugraha	2	10	0.84	179.00	139.70	27.42	77289	2.33	50718	2.42
				18	0.94	202.00	152.30	41.57	177698	2.11	123690	1.83

Vegetable cowpea	Varietal evaluation	Geethika, Arka Mangala	2	15	1.1	246.13	195.05	25.96	774280	2.55	465250	2.03
Vegetable cowpea	ICM	Jyothika	1	10	0.2	32.85			30714	1.45	0	
Vegetable cowpea	IPM	Arka Managala	1	10	1	135.00	112.00	20.54	212500	2.21	135500	1.82
Vegetable Cowpea	Bio intensive pest and disease management	Arka Mangala, Geethika	2	28	1.2	217.89	186.79	16.75	886760	2.5	583959	1.9
Vegetable cowpea	INM	Jyothika	3	40	1.8	188.60	151.00	24.72	378709	1.86	232016	1.53
				103	5.3	164.09	161.21	21.99	456593	2.12	283345	1.81
Cucumber	IPDM	Local	1	5	0.25	42.00	32.00	31.25	51550	2.65	22000	1.61
Lettuce	Organic production	Chinese yellow	1	10	0.8	85.00	75.00	13.33	119400	1.66	201900	2.12
Nutritional garden	Nutrition Securiy among Farm families	Anaswara, Vellayani, Jyothika, Arun, Arka Anamika, Co-2, Anugraha, Local	8	75	1.64	130.78			67658	2.21		
Okhra	Hi-tech cultivation	Salkeerthi	1	1	0.24	220.00	170.00	29.41	607200	4.90	-41600	0.56
Tomato	INM	Local	1	5	0.04	325.00	260.00	25.00	5	2.47	3	2.03
Tomato	Micronutrient deficiency	Anagha	1	10	0.4	261.00	248.00	5.24	44200	1.63	32200	1.48
Tomato	ICM	Manuprabha	1	10	0.2	281.25	242.16	16.14	603750	3.52	486480	3.03
				25	0.64	289.08	250.05	15.46	215985	2.54	172894	2.18
Winged bean	Varietal evaluation	Pt 21	1	10	0.1	25.00	17.00	47.06	30000	2.50	25000	2.39
Milky Mushroom	Production management	Bheema (kg/bed)	1	5	0.01	1.37	1.25	9.60	325	4.82	285	4.17
				354	14.89							



Demonstration of cowpea var. Geethika by KVK Alappuzha

3.1.2.8 Tuber crops

A total of 32 frontline technologies were demonstrated in tuber crops like cassava, greater yam and sweet potato in 2.88 ha area by KVKs of Kerala during 2018-19 (Table 37). The demonstration on INM in cassava gave 678.97q/ha which is 8.78% higher than the farmers practise. Sree Neelima and Sree pavitra in greater yam and cassava respectively, have recorded superior yield 343.90 q/ha and 360 q/ha and BCR 2.93 and 2.13 as compared to their local checks. Sweet potato variety Sree kanaka gave net returns of Rs 163500/ha over check of Rs 112200/ha (Table 37).



Table 37: Frontline demonstrations on tuber crops conducted in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Cassava	INM	Ambakadan	1	10	2	678.97	624.65	8.70	336470	1.98	268150	1.75
Cassava	Varietal evaluation	Sree Pavithra	1	6	0.24	360.00	280.00	28.57	286000	2.13	166000	1.65
				16	2.24	519.49	452.33	18.63	311235	2.05	217075	1.70
Greater Yam	Varietal demonstration	Sree Nelima	1	10	0.04	343.90	266.80	28.90	681575	2.76	433350	2.09
Sweet potato	Human nutrition	Sree Kanaka	1	6	0.6	165.00	147.00	12.24	163500	1.82	112200	1.57
				32	2.88							

3.1.2.9 Fruit crops

A total of 276 demonstrations on major fruit crops like acid lime, banana, fig, grapes, citrus, guava, mango and pomegranate were conducted in Karnataka and Kerala states covering an area of 65.35 ha during the year. The state wise and technology wise results are discussed in the foregoing discussions.

Karnataka: A total of 157 demonstrations on various fruit crops were conducted in farmers' fields covering 53.2 ha area (Table 38). The results indicated that the yield was substantially higher under demonstration of ICM, INM, micronutrient management and quality enhancement technologies in banana with BCR as high as 6.57 in G-9 variety of banana. Among the technologies demonstrated in banana, ICM technology demonstration registered highest yield of over 447 q/ha. Demonstrations conducted

on micronutrient management in guava gave 264.70 q/ha yield as compared to farmers' practice (226.40 q/ha). ICM and IPDM demonstration in mango resulted in 16.30% and 37.36 % increase in yield over farmers practice. In grapes IPDM in Bangalore blue variety has given 251.50 q/ha yield than the check (203.40 q/ha). ICM and nutrient management in lime (citrus) also performed superior under demonstrations with better economic returns. Demonstration of ICM in fig gave an average fruit yield of 89.40 q/ha with better economic returns. In pomegranate, IPDM, IDM and light traps for fruit sucking moth in Bhagwa variety proved superior over farmers' practice by recording 17.50%, 13.64% and 25.815% higher yield over farmers practice, respectively. The average yield under technology demonstration in pomegranate was 171.13 q/ha as compared to only 144.87 q/ha in the farmers' practice.

Table 38: Frontline demonstrations on fruit crops conducted in the state of Karnataka

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Lime	ICM	Kagzi lime	3	15	4.4	112.55	90.65	22.49	281480	3.84	177268	2.84
Acid lime	Nutrient management	Kagzi (Fruits/tree)	1	10	1	645.00	600.00	7.50	144400	3.33	133500	3.28
				25	5.4	378.77	345.32	14.99	212940	3.58	155384	3.06
Banana	ICM	G-9	1	10	4	447.00	424.00	5.42	378760	6.57	349540	5.72
Banana	INM	G-9	2	15	6	358.60	332.00	8.08	214950	2.84	179299	2.53
Banana	INM	Putta bale	1	10	4	114.00	82.00	39.02	218000	2.76	141300	2.35
Banana	Micronutrient in banana	G9	1	10	4	412.50	321.70	28.23	222120	3.06	162150	2.70

Banana	Quality enhancement	G-9	1	10	2	442.00	392.60	11.18	242800	2.57	202840	2.35
				55	20	354.82	310.46	18.39	255326	3.56	207026	3.13
Fig	ICM	Ballari local	1	10	4	89.40	80.50	11.06	203540	3.34	176153	3.06
Grapes	Nutrient management	Thomson seedless	2	15	6	177.25	100.45	82.16	308620	2.50	254410	2.26
Grapes	ICM	Grape	1	10	4	34.65	30.05	15.31	680050	2.89	472230	2.26
Grapes	IPDM	Bangalore Blue	1	5	1	251.50	203.40	23.65	333066	2.71	205196	2.14
				30	11	154.47	111.30	40.37	440579	2.70	310612	2.22
Guava	Micronutrient management	Allahabad Safed	1	3	1.2	264.70	226.40	16.92	334717	2.72	259133	2.34
Mango	ICM	Baneshan	1	10	2	125.60	108.00	16.30	258300	6.99	209500	5.93
Mango	IPDM	Alphonso	1	4	1.6	250.00	182.00	37.36	102577	3.16	67572	2.64
				14	3.6	187.80	145.00	26.83	180439	5.07	138536	4.28
Pomegranate	IDM	Kesar	1	5	2	150.00	132.00	13.64	373700	5.23	304650	4.90
Pomegranate	Light traps for fruit sucking moth	Kesar/ Bhagwa	1	5	2	128.40	102.60	25.15	693800	4.38	517640	3.58
Pomegranate	IPDM	Kesar	1	10	4	235.00	200.00	17.50	672500	5.48	529500	4.11
				20	8	171.13	144.87	18.76	580000	5.03	450597	4.19
				157	53.2							



ICM in mango by KVK Gadag



ICM in Banana by KVK Shivamogga

Kerala: A total of 119 demonstrations were implemented by KVKs of Kerala on banana and mango covering 12.15 ha area during the year (Table 39). The technologies such as pest management, ICM, INM, demonstrated in Nendran banana have performed better with an average yield of

269.36 q/ha as against their local check (217.56 q/ha). In mango, ecofriendly pest management demonstration conducted across 59 homesteads gave a yield of 51.77 q/ha, which is 163.92% higher than the farmers' check (27.97 q/ha).

Table 39: Frontline demonstrations on fruit crops conducted in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Banana	ICM	Nendran	2	15	2	286.88	222.82	29.33	370050	1.59	279273	1.60
Banana	Intercropping	Big Ebanga	1	5	0.25	311.50	240.00	29.79	502750	1.86	277500	1.49
Banana	INM	Nendran	3	30	1.1	329.07	279.42	17.41	293542	1.55	257867	1.50
Banana	Pest management	Nendran	1	10	1.2	150.00	128.00	17.19	274170	2.56	218520	2.32
				60	4.55	269.36	217.56	23.43	360128	1.89	258290	1.73
Mango	Eco friendly pest management	Local, Sindoor, Alphonso	3	59	7.6	51.77	27.97	163.92	124508	3.33	79217	1.98
				119	12.15							



IPM in mango by KVK Ernakulam

3.1.2.10 Plantation crops

A total of 170 demonstrations were undertaken by the KVKs of Karnataka and Kerala states on major plantations

like arecanut, coconut, cashew and coffee covering an area of 71 ha during the year. The state wise and technology wise results are discussed below.

Karnataka: A total of 110 demonstrations on plantation crops like arecanut, coconut, cashew and coffee were conducted in 44 ha area by 10 KVKs of Karnataka state (Table 40). The overall yield increase recorded in arecanut demonstrations as compared to farmers' practice was 23.13 % with 17.17 q/ha chali yield due to ICM and IPM technology. In coconut, ICM demonstrated in 40 farmers' fields gave an overall 67.82% higher nut yield with 14312 nuts/ha/year. INM and crop production technologies demonstrated in cashew gave an average yield of 11.87 q/ha as compared to 8.13 q/ha under farmers' practice of cultivation. In coffee, INM was demonstrated among 10 farmers and recorded cherry yield of 37.50 q/ha over local check (31.15 q/ha).

Table 40: Frontline demonstrations on plantation crops conducted in the state of Karnataka

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Arecanut	ICM	Hirehalli local	3	35	11	16.24	12.75	24.38	284327	3.02	185023	2.49
Arecanut	IPM	Mangala	1	5	1	18.10	14.85	21.89	197800	3.00	138700	2.64
				40	12	17.17	13.80	23.13	241064	3.01	161862	2.57
Cashew	Crop Production	Local	1	10	4	10.50	5.94	76.77	72900	2.71	25737	1.65
Cashew	INM	Ullal-1	1	10	2	13.23	10.32	28.20	148713	3.97	86445	2.87
				20	6	11.87	8.13	52.48	110807	3.34	56091	2.26

Coconut	ICM in dwarf coconut	Malasyain Orange	1	10	4	6300.00	4900.00	28.57	28345	1.69	13475	1.44
Coconut	ICM	Arsikere Tall	1	20	8	14312.00	8528.00	67.82	114620	3.01	67805	2.96
Coconut	Intercropping	Arsikere tall	1	10	4	7962.00	7680.00	3.67	72917	2.37	38736	2.02
				40	16	9524.67	7036.00	33.36	71961	2.36	40005	2.14
Coffee (Cherry yield)	INM	S-274	1	10	10	37.50	31.15	20.39	142200	2.35	106400	2.07
				110	44							



IPM in Arecanut by KVK Tumkur-II



Boron demonstration in Coconut by KVK Hassan

Kerala: Coconut, the important plantation crop of Kerala was demonstrated under IPM technology in 60 fields of farmers covering an area of 27 ha during the year (Table 41).The IPM technology demonstration gave an

yield of 16000 nuts/ha/year over farmers' practice (13456 nuts/ha/year) leading to net returns of Rs 82703 /ha as compared to only Rs 57731/ha in farmers practise.

Table 41: Frontline demonstrations on plantation crops conducted in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	*Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Coconut	IPM	WCT	2	60	27	16000	13465	22.39	82703	3.06	57731	2.72



Management of red palm weevil by KVK Palakkad

3.1.2.11 Spice crops

A total of 229 demonstrations were under taken in major spices like black pepper, chilli (dry), turmeric and coriander covering an area of 54.76 ha in the states of Karnataka and Kerala by the KVKs under ATARI under Zone-XI.The state wise and technology wise results are discussed below:

Karnataka: In spices, a total of 100 demonstrations were conducted in black pepper,coriander, chilli and turmeric covering an area of 33.00 ha during the year (Table 42).The yield recorded in black pepper under ICM, IPM and IDM technologies was 12.76 q/ha, 4.64 q/ha and 4.81 as compared to farmers' practice with 10.35 q/ha,

3.80 q/ha and 3.83 q/ha , respectively. Varietal evaluation of Arka Isha in coriander has given 26.32% higher yield (12.0 q/ha) as compared to local check (9.5 q/ha). ICM in chilli gave superior dry chilli yield of 28.25 q/ha under

demonstrations as compared to their local checks. ICM and INM technology in turmeric gave an overall increase of 44.30% over their local checks.

Table 42: Frontline demonstrations on spice crops conducted in the state of Karnataka

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Black pepper	ICM	Panniyur-1	3	20	4.5	12.76	10.35	23.26	291688	3.51	196213	2.97
Black pepper	IDM	Panniyur-1	1	10	2	4.81	3.83	25.59	90169	2.66	64294	2.27
Black pepper	IPM	Paniyur	1	25	10	4.64	3.80	22.11	109630	2.10	72000	1.73
				55	16.5	7.40	5.99	23.65	163829	2.76	110836	2.32
Coriander	Varietal evaluation	ArkaIsha	1	5	2	12.00	9.50	26.32	146000	5.29	-31750	0.07
Turmeric	ICM	IISR Pratibha	1	5	0.5	71.10	42.20	68.48	287900	3.08	135100	2.14
Turmeric	INM	Salem	1	10	4	80.60	67.10	20.12	347680	3.56	266605	2.96
				15	4.5	75.85	54.65	44.30	317790	3.32	200853	2.55
Chilli	ICM	Sankeshwar, Bydagi	3	25	10	28.25	21.26	33.07	208020	3.81	68717	2.28
				100	33							



ICM in black pepper by KVK Udupi



ICM in pepper by KVK Shivamogga

Kerala: A total of 129 demonstrations were implemented in black pepper, cardamom, ginger and turmeric crops by 15 KVKs of Kerala covering 21.76 ha area (Table 43). In black pepper, disease management demonstration gave an increased yield of 15 q/ha over the farmers’ practice 10.25 q/ha. The cardamom yield was higher with organic farming with 57 q/ha as compared to 45 q/ha in farmers’

practice. Ecofriendly disease management demonstration gave higher yield of 242.5 q/ha in ginger over their check (150 q/ha). In turmeric, ICM demonstration led to the yield 199 q/ha whereas in Kasturi turmeric the seed production technology gave an average yield of 40 q/ha with net returns of Rs 340000/ha.

Table 43: Frontline demonstrations on spice crops conducted in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Black Pepper	Crop production	Panniyur 1	1	10	2	6.82	3.73	82.84	90990	1.87	15630	1.16
Black pepper	Disease management	Panniyur-1, Panniyur-5	2	15	10	15.00	10.25	57.58	231315	1.97	42500	1.18
Black pepper	INM	Panniyur 1	2	15	1.2	9.17	7.24	34.97	159738	2.46	115569	2.06
				40	13.2	10.33	7.07	58.46	160681	2.10	57900	1.46
Cardamom	Organic farming	Njallani	1	5	3	57.00	45.00	26.67	380000	2.23	175000	1.48
Ginger	Disease management	Rio de janeiro, Varada	2	15	1.5	135.63	105.25	56.85	382210	1.94	157074	1.65
Ginger	Ecofriendly disease management	Local	1	25	1	242.50	150.00	61.67	957250	2.29	363250	1.53
Ginger	ICM	Varada	1	10	1	192.00	152.50	25.90	201271	2.11	113975	1.60
Ginger	INM	Varada	2	15	0.8	193.00	162.00	19.16	552250	1.94	377750	1.63
				65	4.3	190.78	142.44	40.89	523245	2.07	253012	1.60
Kasturi turmeric	Seed production	Kasturi turmeric	1	4	0.01	40.00	-		340000	2.31		
Turmeric	ICM	IISR Pragati	2	15	1.25	199.00	124.00	60.48	476771	1.92	150304	1.32
				19	1.26							
				129	21.76							



Demonstration on black pepper by KVK Wayanad

3.1.2.11 Medicinal crops

A total of 8 demonstrations were under taken in aloe vera and arrowroot covering an area of 0.13 ha in the state of Kerala under Zone-XI. The results are discussed below:

Kerala: ICM technology demonstration in aloe vera crop has given yield of 2.4 kg/bag and intercropping of local variety of arrowroot in coconut plantation showed superior performance in yield (80 q/ha) with net returns of Rs 141000/ha.

Table 44: Frontline demonstrations on medicinal crops in Kerala during 2018-19

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration	
						Demo	Check		Net Return (Rs./ha)	BCR
Aloe vera	ICM	Aloe vera	1	2	0.01	2.4 kg/bag	-			
Arrowroot	Intercropping	Local	1	6	0.12	80.00	0.00	0.00	141000	1.78
				8	0.13					

3.1.2.12 Flower crops

A total of 59 demonstrations on flower crops covering an area of 16 ha were implemented by KVKs of Karnataka and Kerala states during the year. The technology- wise and state-wise results are discussed in the foregoing discussion.

Karnataka: Demonstrations were implemented in flower crops such as China aster, chrysanthemum, Bhatkal jasmine, rose and tube rose covering 15.6 ha area by the KVKs of Karnataka (Table 45). In China aster, ICM in Arka Kamini variety gave 22.20% higher yield (74.30 q/ha) as compared to farmers' practice (60.80 q/ha). The ICM

technology in chrysanthemum led to 17.11% increased flower yield (6.18 q/ha) with BCR of 2.16 as compared to 5.26 q/ha and BCR of 1.83 in farmers' practice. The ICM in jasmine (bhatkal) gave 49.92 q/ha flower yield as compared to 42.90 q/ha flower yield with farmers' practice leading to better BCR of 3.55. The ICM in charishma and Arka sari variety introduction in rose gave 121.50 q/ha, and 214 q/ha respectively as compared to 108.30 q/ha and 169.05 q/ha under farmers' practice of cultivation. The Shringar variety of tuberose demonstration gave an average flower yield of 122.5 q/ha with net returns of Rs 645000/ha.

Table 45: Frontline demonstrations on flower crops conducted in the state of Karnataka

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	Economics of demonstration		Economics of check	
						Demo	Check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Jasmine	ICM	Bhatkal Mallige	1	5	1	49.92	42.90	16.36	1992145	3.55	1627149	3.15
China Aster	ICM	Arka Kamini	1	5	1	74.30	60.80	22.20	72626	2.97	99420	3.90
Chrysanthemum	ICM	Chandani Local	3	13	4.6	6.18	5.26	17.11	191134	2.16	149204	1.83
Rose	ICM	Charishma	1	10	4	121.50	108.30	12.19	109912	2.88	86820	2.38
Rose	Variety introduction	Arka savi	2	10	3	214.00	169.05	39.61	197200	4.28	137950	3.30
				20	7	167.75	138.68	25.90	153556	3.58	112385	2.84
Tube rose	Crop Production	Sringar	1	6	2	122.50	97.00	26.29	645000	8.17	502000	7.28
				49	15.6							



Demonstration on ICM in China aster by KVK Hirehalli

Kerala: Demonstration in marigold crop covering 0.4 ha area with Varietal demonstration (Phule narangi) led to flower yield of 30.25 q/ha and net returns of Rs 5350/ha.

Table 46: Frontline demonstrations on flower crops conducted in the state of Kerala

Crop	Thematic Area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% Increase	*Economics of demonstration	
						Demo	Check		Net Return (Rs./ha)	BCR
Marigold	Varietal demonstration	Pusa Narangi	1	10	0.4	30.25			53500	1.79

3.1.2.13 Demonstrations on Hybrids

During the year, 478 demonstrations on hybrids in various crops were conducted by the KVKs in the states of Karnataka (445) and Kerala (33) covering 154.23 ha area in crops like paddy, maize, tomato, sunflower, cabbage, chilli, cotton, brinjal, bittergourd, cucumber, onion, ridgegourd, tomato, marigold, tuberose, sunflower, fodder and watermelon. The State-wise and hybrid-wise results are presented in the foregoing discussion.

Karnataka: A total of 445 demonstrations were conducted by 21 KVKs of Karnataka on hybrids covering 153.35 ha area as presented in the (Table 47). In paddy, KRH-4 gave 72.5 q/ha, which was 52.6% higher yield over check. In maize private hybrids CP-818 and NK6661 were demonstrated, with 14.79% and 10.0% higher yield over farmers' variety. In bajra, DPMH-4 gave 15.36 q/ha, which was 22.9% higher yield over check variety. In cotton, Bt hybrids were demonstrated with 70 farmers covering 28 ha across 8 KVKs and found superior (19.9%) to farmers varieties with better net returns. In sunflower, DHM-103 recorded 25.9 % higher yield (15.57 q/ha) over farmers' variety (12.37 q/ha). The private hybrid of cucumber gave

yield of 137.4 q/ha, which was 12.3% higher over local variety. The brinjal hybrids, Arka Harshitha (27.8%) and MHPJ-110 (26.5%) performed superior to check varieties by registering an average yield of 239q/ha and 215 q/ha, respectively with higher economic returns. In cabbage Mahyco 118 recorded 8.4% higher yield (353q/ha) as compared to local variety (325.60q/ha). In chilli, hybrids Sitara, Arka Kyathi and Arka Meghana have performed superior to their local check varieties. The tomato hybrids, KSP 1278 (13.3%), Shivam (10.7), Indus 1030 (21.6%), Arka Rakshak (50%), Arka Samrat (27%) have performed better than varieties and gave better economic returns to the farmers. In watermelon, private hybrid gave 550 q/ha. Vijay hybrid of onion recorded yield of 148.2 q/ha under demonstrations as compared to 121.20 q/ha in the farmers' variety. The Ridgegourd, private hybrid recorded an yield of 61.0 q/ha as compared to their check variety (49.60 q/ha). Marigold hybrid Benz tall performed better under Karnataka condition with 22% higher yield (121.3 q/ha) and BCR of 2.64 over farmers check variety (99.40 q/ha). In tuberose, Arka Prajwal showed better performance with net returns of Rs 156736 /ha as compared to Rs 223921/ ha in farmers practice.

Table 47: Frontline demonstrations on hybrids conducted in the state of Karnataka

Crop	Name of hybrid	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% change	Economics of hybrid		Economics of Check	
					Demo	Local check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Paddy	KRH-4	1	10	4	72.5	47.50	52.6	67731	2.24	25990	1.44
Paddy	1001	1	10	4.0	69.9	58.90	18.7	94647	3.71	116170	4.10
Paddy	VNR	1	10	4	65.5	58.70	11.6	56819	2.79	47571	2.50
Maize	CP-818	4	35	10.4	62.36	53.82	14.79	59972	2.58	46383	2.26
Maize	MAH-14-5	2	15	4	53.67	47.97	10.44	56504	2.80	62063	2.85
Maize	NK-6240	1	10	4	66	43.80	49.8	23200	1.55	57200	2.39
Maize	NK 6661	1	10	4	53.88	49.00	10.0	36517	1.93	48261	2.37
Maize	Private	1	30	12	45.22	36.55	23.7	41342	1.98	23777	1.57
Bajra	DPMH-4.	1	5	2	15.36	12.50	22.9	10212	2.24	6610	1.93
Cotton	Bt hybrids	8	70	28	22.33	18.88	19.9	69867	2.73	56467	2.58
Sunflower	DHM103	1	10	4	15.57	12.37	25.9	34777	2.96	51080	3.69



Sunflower	RSFH 1887	2	22	9	12.85	11.27	13.3	29824	2.54	22403	2.13
Bitter gourd	Private	1	2	0.5	106.3	95.30	11.5	61045	1.92	40933	1.64
Brinjal	ArkaHarshita	1	5	1	239	187.00	27.8	257030	4.23	355775	5.78
Brinjal	MHBJ-110	1	10	4	215	170.00	26.5	215500	3.01	94000	1.85
Cabbage	Mahyco-118	1	5	2	353	325.60	8.4	71050	2.35	50810	1.80
Cabbage	Sent	1	10	4	64.05	56.81	12.7	263384	4.40	320913	6.06
Chilli	ArkaKyathi	2	15	3	265.8	196.6	34.6	161113	3.3	232400	3.9
Chilli	ArkaMeghana	2	15	3	196.3	160.4	20.2	385582	2.91	398577	3.17
Chilli	Sitara	1	20	8	199.5	160.40	24.4	375202	4.58	285993	3.89
Cucumber	Private	1	5	2	137.4	122.30	12.3	95290	2.71	69275	2.31
Onion	Vijay	1	10	4	148.2	121.20	22.3	37377	1.29	27400	1.23
Ridge gourd	Private	1	8	3.2	61	49.60	23.0	36174	1.74	29975	1.68
Tomato	ArkaRakashk	1	5	2	570	380.00	50.0	448000	4.67	258000	3.11
Tomato	ArkaSamrat	3	40	14	502	382	27	161475	2.52	97933	1.90
Tomato	KSP1278	1	5	2	541.4	478.00	13.3	340320	4.67	282400	3.82
Tomato	Shivam	1	10	4	61.14	55.21	10.7	27261	1.42	14446	1.21
Tomato	Indus-1030	1	5	1	631.0	519.00	21.6	235428	2.05	156630	1.70
Fodder	DHN-6	2	15	2	1061	473	209	31624.5	3.39	83367	2.97
Marigold	Benz tall	1	5	1.0	121.3	99.40	22.0	135680	2.64	97060	2.19
Tuberose	Prajwal	1	6	0.25	131.7	95.90	37.3	156736	2.62	223921	3.20
Watermelon	Private hybrid	2	12	3	550	489	12.0	270404	4.05	207918	3.41
			445	153.35							

Kerala: A total 33 demonstrations were conducted on hybrids in tomato and ridge gourd in 0.88 ha area in KVKs of Kerala (Table 48). The tomato hybrids Arka Rakshak showed yield of 327.5 q/ha as compared to their respective check variety (263 q/ha). In ridge gourd KRH-1 has given 191.5 q/ha yield as compared to 132.5 q/ha farmers check variety.



Demonstration on Chilli hybrid Arka Kyathi by KVK Tumkur-II

Table 48: Frontline demonstrations on hybrids conducted in the state of Kerala

Crop	Name of hybrid	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)		% change	Economics of hybrid		Economics of Check	
					Demo	Local check		Net Return (Rs./ha)	BCR	Net Return (Rs./ha)	BCR
Tomato	ArkaRakashk	1	3	0.06	327.5	263.00	24.5	201000	1.62	330000	2.02
Ridge gourd	KRH-1		30	0.82	191.5	132.5	46.7	28000	1.39	79200	1.92
			33	0.88							

3.1.2.14 Frontline demonstrations on farm implements and tools:

Farm mechanization was popularized through 30 demonstrations of farm implements covering an area

of 14.20 ha during the year by KVKs of Karnataka and Kerala under ATARI, Zone XI. The state-wise details of implements demonstrated are presented in the foregoing discussion.



Karnataka: During the year two farm implements / machinery through 15 farmers fields were demonstrated in two districts covering 4 ha in the state of Karnataka (Table 49). Use of cycle weeder in pigeon pea cultivation has reduced the time required to cover 1 ha to 20 hours, labour requirement to only 7 man days as against 20 man days and

overall cost by 26 % over check. The demonstration of hand operated cocoon deflosser has saved the time required for removal of flossy layer from cocoons by 75% and reduced the 50% labour and 3.35% cost involved during deflossing of cocoon besides fetching higher market price.

Table 49: Frontline demonstrations on farm implements conducted in the state of Karnataka

Name of the implement	Crop	Technology demonstrated	Farmer (No.)	Area (ha)	Observation (output/man hour)		% change	Labor reduction (mandays)		% change	Cost reduction (Rs./ha)		% change
					Demo	Check		Demo	Check		Demo	Check	
					Cycle Weeder	Pigeon pea		<ul style="list-style-type: none"> • Blade Harrowing • Seed Cum Fertilizer Driller • Seed treatment • Inter cultivation through cycle weeder • Power Sprayer 	10		4	36.42	
Cocoon deflosser	Farm Implements	Reducing drudgery and increasing efficiency	5	NIL	8	32	75	2	4	50	30940	27180	3.35
			15	4									

Kerala: Demonstrations on mechanised paddy transplanter in paddy, tractor attached planter, rice transplanter were implemented by 3 KVKs in the state of Kerala during the year (Table 50). Mechanised paddy transplanter saved 94% of the man days over check. In

sugarcane crop, tractor attached planter has made 50% reduction in man days and also 50% reduction in labour cost. Various implements in rice crop like rice transplanter, conoweeder, combined harvester and straw baler had reduced 21% in labour cost.

Table 50: Frontline demonstrations on farm implements conducted in the state of Kerala

Name of the implement	Crop	Technology demonstrated	Farmer (No.)	Area (ha)	Observation (output/man hour)		% change	Labor reduction (mandays)		% change	Cost reduction (Rs./ha or Rs./Unit)		% change
					Demo	Check		Demo	Check		Demo	Check	
					Mechanized paddy transplanter	Paddy		Mechanized paddy transplanting	5		6	1.44	
Tractor attached planter	Sugarcane	Mechanized sugarcane cultivation in the GI belt of Kottayam	5	0.2				83	125	50	0.665	1	50
Rice transplanter, Conoweeder, Combine harvester, Straw baler	Rice	Mechanised cultivation in rice	5	4				44	104	58	37890	48000	21
			15	10.2									



Straw baler demonstration by KVK Kasargod

3.1.2.15 other enterprises:

A total of 500 demonstration units were developed on other enterprises such as EDP, Value addition, nutrition garden, terrace gardening, oyster mushroom sericulture, tailoring cum embroidery and vermicompost through establishment of 256 per demo. mainly for farm women by the KVKs of Karnataka and Kerala during the year.

Karnataka: 202 demonstration units were established under various small scale income generating enterprise such

as EDP, Value addition (fruits, millets, tamarind), nutrition gardens, terrace gardening, oyster mushroom sericulture, tailoring cum embroidery and vermicomposting (Table 51). In sericulture, tree mulberry unit under rainfed conditions, enhanced the net income of farmers by Rs 80215/ha. Organic sources of soil nutrition and intergrated pest management of leaf roller were demonstrated by 20 farmers in Kolar district led to better economic returns and employment generation. Demonstration on improved silkworm rearing practises for cocoon yield maximization in Mandya gave economic returns of Rs 20709/unit. In millets, fruits, tamarind small scale enterprises on value added products were established under 7 KVKs of Karnataka and value added products such as cookies and chakli, are being prepared by SHG in KVK Belagavi-I. Nutrition garden for nutritional security for farm families and terrace gardening demonstrations increased vegetable adequacy upto 38 %. Oyster mushroom production as an enterprise is being promoted by 49 farmers under four KVKs Chikkaballapura, Chikkamagaluru, Tumkur and Koppal. Mysuru, Kodagu, Ramanagra, Hassan and Raichur also gave good supplementary income. Income earning activities like tailoring and embroidery works demonstrated in Uttar Kannada helped to earn Rs 1025/month by each member.

Table 51: Frontline demonstrations on enterprises conducted by KVKs of Karnataka

Name of KVK	Category	Technology demonstrated	Farmer (No.)	Units (No.)	Parameter and unit	Results	Economic returns (Rs/unit)
Gadag	EDP	Primary processing of millets & marketing of processed millet products	3	3 units	Amount earned (Rs/unit/year)	16100	16100
Raichur	EDP	Foxtail millet bharfi	2	2 CIGs	Returns (Rs/batch)	6000	6000
			5	5 units			
Ramanagara	Value addition	Osmotic Dehydration of Fruit Bits for Enhanced Income	1	1 unit	% fruit recovery	Jack -37.5, Mango-25.6, Papaya-21.45,	2606/batch
Tumkur-II	Value addition	Demonstration of Finger millet Variety KMR 340 for Value Addition	5	2 units	Returns (Rs/ha)	49668	29268
Tumakuru I	Value addition	Production, branding and market linkage of value added foxtail millet products	10	10 units	Additional returns (Rs/q)	1400	
Kolar	Value addition	Entrepreneurship development of women Self Help Group through branding and marketing of Protein enriched mango spicy bar	1	1 unit	Mango spicy bar produced (kg)	785	60376



Kolar	Value addition	Demonstration of nutrition Garden for nutritional security to farm families	10	10 units	Vegetable produced (kg/unit/year)	851	17574
Belagavi-II	Value addition	Preparation of cookies and chakali from foxtail millet, finger millet and navane	1	1 SHG	kg millets/month	55	6600/month
Chamarajanagar	Value addition	Microenterprise in Tamarind for economic empowerment of farmwomen	1	1 unit	Income earned (Rs/month)	20250	
			29	26 units			
Chamarajanagar	Nutrifarms	Nutrition garden for nutritional security of farm families	10	10 units	Amount saved (Rs/year/family)	6565	0
Raichur	Nutrifarms	Nutrition garden	10	10 units	Vegetable production (kg/day)	2	2000/month
Gadag	Nutri farms	Nutrition garden for nutritional security of farm families	10	10 units	Amount spent towards vegetables (Rs/year)	2400	5130
Tumakuru I	Nutrition garden	Nutrition garden for nutritional security of farm families	4	4 units	Percentage vegetable requirement met	21	75% knowledge gain
Mysuru	Nutriton Garden	Nutrition garden for nutritional security of farm families	15	15 units	Vegetable production (kg/year)	905	Vegetable adequacy 38%
Davanagere	Terrace gardening	Demonstration of Terrace Garden in Davanagere City	10	10 units	Vegetable yield (kg/week)	15	6000
			59	59			
Raichur	Oyster mushroom	Cultivation of Oyster mushroom	2	2 units	Mushroom yield (kg/day/unit)	20	5000
Hasan	Oyster mushroom	Cultivation of Oyster mushroom	5	2 CBA	Mushroom yield (kg/day/unit)	47	3050/batch
Ramanagara	Oyster mushroom	Cultivation of Oyster mushroom	1	1 unit	Mushroom yield (kg/day/unit)	42	6333
Kodagu	Oyster mushroom	Cultivation of Oyster mushroom	4	4 units	Mushroom yield (kg/day/unit)	46.6	7200
Koppal	Oyster mushroom	Cultivation of Oyster mushroom	2	2 SHGs	kg mushroom/kg spawn	8.7	2225
Tumkur-II	Oyster mushroom	Oyster mushroom production, value addition and market linkage	2	2 units	Returns (Rs/batch)	9235	
Tumakuru I	Oyster mushroom	Mushroom Cultivation-IGA activity in SHG	30	2 SHGs	Mushroom yield (kg/day/unit)	18.5	2832
Mysuru	Oyster mushroom	Cultivation of Oyster mushroom	2	1 unit	Mushroom yield (kg/day/unit)	115.25	8830
Chikkamagaluru	Oyster mushroom	Cultivation of Oyster mushroom	1	1 SHG	Mushroom yield (kg/day/unit)	20.5	1175
			49	17 units			



Kolar	Sericulture	Demonstration of tree mulberry for rainfed sericulture	10	4 ha	Cocoon yield (kg/ha)	234.98	80215
Kolar	Sericulture	Enhancing mulberry leaf yield through organic sources	5	2 ha	Leaf yield (q/ha)	11.56	
Kolar	Sericulture	Integrated pest management of mulberry leaf roller	5	2 ha	Leaf yield (q/ha/crop)	111.8	32034
Mandya	Sericulture	Improved silkworm rearing practices for cocoon yield maximization	10	1000 DFLs	Cocoon (kg/100 dfls)	85.16	20709
			30	12 ha			
Uttar Kannada	Tailoring and embroidery	Tailoring and embroidery (Blouse + Saree)	27	27	Income earned (Rs/month/member)	1025	
Hasan	Vermicompost	Education on segregation of types of garbage, Use of daily dump kit for composting (4 q/family/yr), Use of compost in Home gardens	3	3 units	Vermicompost (kg/batch)	52.87	310
		Total	202	110			



Demo on Mushroom cultivation by KVK Hassan



Demonstration on Nutritional garden by KVK Belagavi-I

Kerala: A total of 298 demonstration units were established by KVKs of Kerala state under various small scale enterprises like bee keeping, mushroom cultivation, processing and value addition during 2018-19 (Table 52).

Ten units of honey production through scientific apiculture practises led to economic returns of Rs 184/unit /crop in KVK Alappuzha. 15 farmers were benefitted

through milky mushroom cultivation demonstration in Kottayam district. Small scale enterprise like cultivation of bush pepper in Idukki benefitted 20 farmers. Product diversification undertaken through value addition in nutmeg rind, pickles, bittergourd, squash, candy etc, has ensured an income of Rs 10160/unit/month and 96 farmers were benefitted in four KVKs.

Table 52: Frontline demonstrations on enterprises conducted by KVKs of Kerala

Name of KVK	Category	Technology demonstrated	Farmer (No.)	Units (No.)	Parameter and unit	Results	Economic returns (Rs/unit)
Alappuzha	Indian Bee	Scientific apiculture practices	10	10	Honey production (kg/unit)	2.5	184
Kottayam	Mushroom	Milky mushroom cultivation	15	1 SHG	Mushroom production (kg/100 bags)	94	22000
Malappuram	Oyster mushroom	High yielding oyster mushroom - Arka OM1	10	1 SHG	Mushroom production (kg/bag)	1.64	278/bed
Idukki	Small Scale Enterprise	Cultivation of bush pepper	20	20	Net returns (Rs/10 bags/unit)	760	0
Kottayam	Value addition	Value addition to nutmeg rind-Pickles	25	1 SHG	Production (kg/day)	10	6000
Thiruvananthapuram	Value addition	Value added products in bittergourd	10	1 SHG	Income (rs/day/unit)	13515	0
Thrissur	Value addition	Value addition of nutmeg rind-Squash, Candy, RTE and Pickles	2	1 SHG	Production : Squash 5000/100 litres, candy 175/kg, RTE – 490/100 pieces, Pickle 220/1kg		10160/month
Idukki	Value addition	EDP on production and marketing of jack based diversified products through SHG	4	1 SHG	Income (Rs/month)	78250	0
		Total	96				
		G.Total	298	146 units			



Demonstration of bee keeping by KVK Alappuzha

3.1.2.16 Livestock:

A total of 625 demonstrations were conducted in livestock covering 410 large ruminant, 157 small ruminants

units, 48 poultry units during the year by the KVKs of Karnataka and Kerala under ATARI, Zone-XI. The state-wise results are furnished below.

Karnataka: A total of 195 in dairy, 149 in sheep & goat and 45 demonstrations in poultry were conducted during the year (Table 53). In dairy, technologies such as dairy production, disease management, fodder management, reproductive disorders management, and nutrition management gave higher milk yield. In case of sheep & goat, technologies such as nutrition management and disease management gave higher body weight over local check. In case of poultry, house fly pest management, nutrition management and scientific backyard management gave higher body weight over local check. In case of piggery, disease management gave higher litter size of 14 kg over local check i.e. 11 kg. In buffalo, reduction of incidence of prolapse was seen due to treatment. The details are given in Table 53.



Table 53: Frontline demonstrations on livestock conducted by KVKs of Karnataka

Name of KVK	Category	Thematic area	No. of Farmer/ Units	Parameter	Results		
					Demos	Check	% change
Haveri	Dairy	Dairy Production	5	Milk lit/day	6.75	5.0	35.0
Hassan	Dairy	Disease management	5	Milk lit/day	12.66	10.48	20.8
Dharwad	Dairy	Disease management	10	Percent prevalence	0	72	
Hassan	Dairy	Health management	3	Milk lit/day	12.5	8.74	43.0
Uttar Kannada	Dairy	Fodder enrichment	5	Milk lit/day	7.29	6.03	20.9
Vijayapura-I	Dairy	Mixed fodder feeding	5	Milk lit/day	11.20	8.20	36.6
Gadag	Dairy	Mixed fodder feeding	10	Milk lit/day	7.34	6.20	18.4
Kalaburagi-I	Dairy	Green fodder feeding	5	Milk lit/day	12.33	8.42	46.4
Kalaburagi-I	Dairy	Green fodder production	3	Milk lit/day	14.39	8.2	75.5
Gadag	Dairy	Green fodder production	5	Milk lit/day	7.78	7.00	11.1
Davanagere	Dairy	Green fodder production	5	Milk lit/lactation	2958	2440	21.2
Raichur	Dairy	Hygiene and health management	5	Incidence of mastitis (%)	40	60	-33.3
Belagavi-I	Dairy	Silage feeding	10	Milk lit/day	21.05	19.65	7.1
Gadag	Dairy	Silage feeding	10	Milk lit/day	7.30	6.35	15.0
Mandya	Dairy	Nutrient management	10	Milk lit/day	9.1	8.04	13.2
Bellari	Dairy	Nutrition Management	20	Milk lit/day	14.61	11.93	22.5
Haveri	Dairy	Nutritional Management	10	Milk lit/day	8.5	6.5	30.8
Tumakuru I	Dairy	Reproductive disorders management	10	Time taken for involution of uterus	95	180	-47.2
Uttar Kannada	Dairy	Reproductive management	14	Conception rate (%)	85.7	28.5	200.7
Kalaburagi-I	Dairy	Scientific Dairy	10	Milk lit/day	12.83	9.29	38.1
Davanagere	Dairy	Nutritional Management	15	Milk lit/lactation	2731.5	1759	55.3
Davanagere	Dairy	Nutritional Management	10	Milk lit/lactation	2692.3	2327	15.7
Tumakuru I	Buffalo	Reducing incidence of prolapse	10	Occurrence of Prolapse (%)	1	20	-95.0
			195				
Kodagu	Pigerry	Disease management	5	Av. Survived Litter size (kg)	14	11	27.3
Belagavi-I	Sheep and goat	Improper Health Management	5	Body wt (kg/animal)	35.5	28.6	24.1
Raichur	Sheep and goat	Notional management	20	Body wt (kg/150 days)	16	13	23.1
Davanagere	Sheep and goat	Nutritional Management	5	Body wt (kg/animal)	69.2	53	30.6
Raichur	Sheep and goat	Stall feeding	5	Body wt (kg/animal)	35.5	25	42.0
Vijayapura-I	Sheep and goat	Small scale income generation enterprise	10	Body wt (kg/animal)	31.6	26.1	21.1
Raichur	Sheep and goat	INM	20	Milk (lit/day)	3.1	3	3.3

Dharwad	Sheep and goat	Disease management	10	Mortality (%)	2	12	-83.3
Raichur	Sheep and goat	IPDM	10	Recovery from foot rot (%)	75	26	188.5
Raichur	Sheep and goat	IPDM	10	Recovery (%)	75	26	188.5
Yadgir	Sheep and goat	Endo parasite management	20	Body wt (kg/animal)	32.95	25.98	26.8
Kalaburagi-II	Goat	Endo parasite management	10	Egg count/year	270	2210	-87.8
Ballari	Sheep	Fodder crops	20	Body wt (kg)	20.18	17.25	17.0
Hassan	Sheep	Health management	4	Body wt of - 20 birds (kg)	21.68	16.58	30.8
			149				
Belagavi-II	Poultry	Backyard poultry	20	Body wt of 20 birds (kg/animal)	290.5	133.7	117.3
Bellari	Poultry	House fly control	15	Body wt (kg/bird in 42 days)	2.25	1.99	13.1
Hassan	Poultry	Nutritional management	10	Body wt (kg/bird)	2.1	1.75	20.0
			45				
Karnataka			394				



Disease management in sheep by KVK Hassan

Kerala: A total of 215 in dairy, 8 in goat, 3 demonstrations in poultry and 5 in piggery were conducted (Table 54). In dairy, technologies such as disease management and nutrition management resulted in higher milk yield over local check. Animal health management in male calf increased the body weight to 112.3 kg/animal over check 49.5. In case of goat, breeding management gave higher body weight of 48.85 kg/animal over local check. Small-scale poultry increased the hatchability of 70.83 % over check 51.66 %. Piglet fattening showed increased body weight of 99.87 kg/animal over check 85.5 kg/animal. Ten farmers were benefitted from disease management demonstration in buffalo. The details are given in following Table 54.

Table 54: Frontline demonstrations on livestock conducted by KVKs of Kerala

Name of KVK	Category	Thematic area	Farmer/Units (No.)	Parameter	Results		
					Demos	Check	% change
Alappuzha	Dairy	Animal Health management in male calf	10	Body wt (kg/animal)	112.3	49.5	126.9
Kollam	Dairy	Breed maintenance	20	Conception rate (%)	45	15	200.0
Kozhikode	Dairy	Breeding and fertility management	25		49	40	22.5
Alappuzha	Dairy	Disease management	25	Milk lit/day	10.5	9	16.7
Thiruvananthapuram	Dairy	Disease management	25	Milk Lit/day	12.4	12	3.3
Thiruvananthapuram	Dairy	Disease management	40	Milk Lit/day	12.8	12	6.7
Idukki	Dairy	Disease management	10	Conception rate (%)	70	30	133.3
Idukki	Dairy	Disease management	20	Milk lit/day	23	18	27.8
Idukki	Dairy	Nutrition management	20	Milk lit/day	18	14	28.6



Pathanamthitta	Dairy	Production and management	10	Milk lit/day	11	6	83.3
Malappuram	Buffalo	Disease management	10	CMT	0	7.5	-100.0
			215				
Ernakulam	Piggery	Quality crossbred piglet for fattening	5	Body wt (kg)	99.87	85.5	16.8
Kozhikode	Goat	Breeding management	8	Body wt (kg)	48.85	30	62.8
Pathanamthitta	Poultry	Small scale income generating enterprises	3	Hatchability (%)	70.83	51.66	37.1
		Kerala	231				
		Zone	625				

Fisheries:

A total of 81 demonstrations were conducted in case of fisheries during the year by the KVKs of Karnataka and Kerala under ATARI, Zone-XI. The state wise break up includes 71 in Karnataka and 10 in Kerala. The state wise and enterprise wise results are as under:

Karnataka: A total of 71 demonstrations in fisheries were conducted in the farmers’ fields during the year (Table

55). Technologies such as composit fish culture in Kodagu and Vijayapura, introduction of tilapia under feed based aquaculture in Chikkamagaluru, rearing of carp fry in jumbo hapas in Davanagere, promotion of inland fisheries in Bagalkot and Dharwad, fish seed nursery rearing and floating pelleted feed in Belagavi were implemented. The details are given in Table 55.

Table 55: Frontline demonstrations on fisheries conducted by KVKs of Karnataka

Name of KVK	Thematic area	Technology demonstrated	Farmer/ Units (No.)	Parameter	Results		% Change
					Demo	Check	
Kodagu	Composite Fish culture	Composite Fish Culture (Grass carp, Rohu and Silver carp in 6:3:1 ratio)	7	Fish yield (q/ha)	64.8	38.4	68.79
Davanagere	Production and Management	Rearing of carp fry in jumbo hapas as an entrepreneurship	2	No of carp fry	150000	45000	70
Bagalkot	Inland fishereis in farm pond	Inland fisheries in farm pond	10	Fish yield (q/ha)	68.5	68.5	
Chikkamagaluru	Introduction of new variety of fish	Introduction of Tilapia under feed based aquaculture	5	Wt/fish (g)	475	150	68.42
Dharwad	Fishery production and management	Promotion of inland fisheries in farm pond	10	Weight gain (g) after 9 months	593		
Vijayapur-I	Small scale income generation enterprise	Composite fish culture in farm ponds	10	Fish yield (q/ha)	62	0	0
Belagavi-1	Inland Fisheries	Fish seed nursery rearing	7		51.68	27.44	87.3
Belagavi-I	Inland Fisheries	Feeding floating pelleted feed	20	Fish yield (q/ha)	37.68	2796	36.7
			71				

Kerala: A total of 81 demonstrations in fisheries were conducted in the farmers’ fields during the year (Table 56). Cage culture of pearl spot fish in Alappuzha gave higher fish yield of 168 kg/cage over local check i.e. 4.5 kg/cage.

Pellet feed on growth and survival of silver pompano in Ernakulam district showed 90% of survival rate over the check (55%). The details are given in Table 56.

Table 56: Frontline demonstrations on fisheries conducted by KVKs of Kerala

Name of KVK	Thematic area	Technology demonstrated	No. of Farmer/ Units	Parameter	Demo	Check
Alappuzha	Pearl spot fishes(Etrophusretensis)	Cage culture of pearl spot fish culture	5	Fish yield (kg/cage)	168	4.5
Ernakulam	Aquaculture	Pellet feed on growth and survival of silver pompano (Trachinotusblochii)	5	Survival rate (%)	90	55
			10			



Demo on fisheries feed management by KVK Ernakulam

3.1.3 Capacity development

During the year under report, 4716 training courses were organized for the benefit of 173873 participants representing farmers, farm women, rural youth and extension functionaries (Table 57). This included 529 sponsored courses (20356 participants) and long duration vocational courses (170 programs with 4492 participants). Majority of the programs were for farmers/farm women (3202 courses) in which 121054 were trained. It indicates that KVKs are preferred by sponsoring agencies for organizing training courses. State-wise break-up indicates that more number of training courses were organized in Karnataka (3080), followed by Kerala (1636). Details are given in Table 57.

Table 57: Participation in training courses organized by KVKs: State-wise and category-wise

State / UT	Farmers / Farm Women		Rural Youth		Extension Functionary		Sponsored Programs		Vocational Programs		Total	
	C	P	C	P	C	P	C	P	C	P	C	P
Karnataka	2264	85509	231	7186	159	6579	366	14255	60	2075	3080	115604
Kerala	938	35545	353	10911	86	3295	163	6101	96	2417	1636	58269
Total	3202	121054	584	18097	245	9874	529	20356	156	4492	4716	173873

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

3.1.3.1 Farmers and Farmwomen

Training courses organized for farmers/farmwomen (Table 58) reveals that crop production was the major area of training with 793 courses and 29934 participants. Training on plant protection (495 courses) and home

science/women empowerment (371 courses) were next major important areas followed by soil health and fertility management (335 courses on 16562 farmers). More programs were also organized for production of inputs at site (204 courses 6529 participants).



Demonstration on nutrient application to areca nut



Method demonstration of 1% BM preparation

Table 58: Training courses organized for farmers and farmwomen

Training Area	Courses (no.)	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		M	F	T	M	F	T	M	F	T
Crop Production	793	19735	5026	24761	3985	1188	5173	23720	6214	29934
Plant Protection	495	12633	3133	15766	2576	967	3543	15209	4100	19309
Home Science/Women empowerment	371	2633	6896	9529	806	1811	2617	3439	8707	12146
Soil Health and Fertility Management	335	10441	2886	13327	2145	1090	3235	12586	3976	16562
Livestock Production and Management	318	6184	2505	8689	2425	788	3213	8609	3293	11902
Production of Inputs at site	204	3401	2279	5680	521	328	849	3922	2607	6529
Capacity Building and Group Dynamics	200	3160	3617	6777	426	687	1113	3586	4304	7890
Horti-Plantation crops	143	3387	938	4325	552	178	730	3939	1116	5055
Horti-Vegetable Crops	130	2587	931	3518	618	182	800	3205	1113	4318
Horti-Fruits	91	1903	487	2390	533	96	629	2436	583	3019
Horti-Spices	5	430	98	528	62	6	68	492	104	596
Horti-Medicinal and Aromatic Plants	3	40	71	111	20	14	34	60	85	145
Agril. Engineering	59	915	393	1308	137	130	267	1052	523	1575
Fisheries	29	447	207	654	113	44	157	560	251	811
Horti-Ornamental Plants	15	402	144	546	89	31	120	491	175	666
Agro-forestry	11	428	52	480	81	36	117	509	88	597
Horti-Spices	5	430	98	528	62	6	68	492	104	596
Horti-Medicinal and Aromatic Plants	3	40	71	111	20	14	34	60	85	145
Grand Total	3202	68726	29663	98389	15089	7576	22665	83815	37239	121054

State-wise data presented in Table 59 reveals that 2264 courses were organized in Karnataka for 85509 participants, and 938 courses were organized in Kerala (35545 participants). Out of the 121054 participants, 22665 (18.7%) were from SC/ST category and 37239 (31%) were women participants.

Table 59: State-wise break-up of the training programs for farmers and farmwomen

State/UT	Courses (no.)	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	2264	50115	17487	67602	12422	5485	17907	62537	22972	85509
Kerala	938	18611	12176	30787	2667	2091	4758	21278	14267	35545
Total	3202	68726	29663	98389	15089	7576	22665	83815	37239	121054

3.1.3.2 Rural Youth

A total of 584 courses were organized for rural youth (18097 participants) in different areas. Value addition was the major training area with 59 courses (2021 participants) followed by 52 courses on integrated farming (1749 participants). The relative popularity of value addition reflects the preference of rural youth in areas representing secondary agriculture (Table 60). Mushroom production (41 courses, 1042 participants), production of organic inputs (40 courses, 1143 participants) and nursery management (40 courses, 1413 participants) were the other important training areas for rural youth.



Gardener training for rural youth

Table 60: Training courses organized for rural youth

Training Area	Courses (No.)	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		M	F	T	M	F	T	M	F	T
Value addition	59	858	820	1678	146	197	343	1004	1017	2021
Integrated farming	52	1179	289	1468	184	97	281	1363	386	1749
Mushroom Production	41	441	476	917	59	66	125	500	542	1042
Production of organic inputs	40	673	327	1000	72	71	143	745	398	1143
Nursery Management	40	586	616	1202	119	92	211	705	708	1413
Rural Crafts	36	0	159	159	2	579	581	2	738	740
Fisheries	32	701	266	967	79	60	139	780	326	1106
Dairying	32	317	223	540	115	89	204	432	312	744
Bee keeping	29	758	260	1018	127	41	168	885	301	1186
Vermiculture	24	530	105	635	79	50	129	609	155	764
Sheep and goat rearing	20	144	22	166	19	1	20	163	23	186
Training and pruning of orchards	18	373	144	517	20	7	27	393	151	544



Entrepreneurship development	17	165	212	377	45	13	58	210	225	435
Capacity building and group dynamics	16	427	308	735	40	41	81	467	349	816
Sericulture	14	541	37	578	155	15	170	696	52	748
Protected cultivation techniques	14	241	141	382	52	27	79	293	168	461
Poultry	13	106	117	223	149	16	165	255	133	388
Repair and maintenance of farm machinery	9	70	50	120	11	11	22	81	61	142
Skill development	8	58	79	137	5	3	8	63	82	145
Seed production	8	138	67	205	6	32	38	144	99	243
Plant protection	8	273	37	310	38	2	40	311	39	350
Commercial fruit production	8	221	89	310	14	13	27	235	102	337
Planting material production	6	47	80	127	7	11	18	54	91	145
Soil and water conservation	5	61	39	100	9	11	20	70	50	120
Small scale processing	5	6	39	45	6	9	15	12	48	60
Tailoring and Stitching	3	35	32	67	0	5	5	35	37	72
Scientific rice cultivation	3	25	29	54	9	6	15	34	35	69
Post Harvest Technology	3	39	52	91	36	28	64	75	80	155
Nutrition security	3	49	58	107	25	32	57	74	90	164
Kitchen Gardening	3	70	1	71	10	8	18	80	9	89
Farm mechanization	3	42	22	64	19	3	22	61	25	86
Quail farming	2	30	42	72	2	4	6	32	46	78
Production of quality animal products	2	23	20	43	5	0	5	28	20	48
Piggery	2	24	14	38	8	3	11	32	17	49
Organic vegetable production	2	41	99	140	10	23	33	51	122	173
Scientific coconut cultivation	2	14	15	29	8	4	12	22	19	41
Household food security	2	8	37	45	0	0	0	8	37	45
Total	584	9314	5423	14737	1690	1670	3360	11004	7093	18097

Kerala: KVKs conducted 353 courses for rural youth as compared to 231 courses in Karnataka (Table 61). Nearly 39.2 per cent of the participants were women, which is a proof for the fact that women are equally eager to acquire knowledge and skills in agriculture and related areas. Youth

belonging to SC/ST also participated in good number (18.6 %) reassuring that the capacity building efforts of KVKs are equally valuable in mainstreaming the youth of socially disadvantaged sections.



Table 61: State/Union Territory-wise break-up of the training programmes conducted for Rural Youth:

State/UT	Courses (no.)	General participants (no.)			SC/ST participants (no.)			Total participants (no.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	231	4504	1463	5967	845	374	1219	5349	1837	7186
Kerala	353	4810	3960	8770	845	1296	2141	5655	5256	10911
Total	584	9314	5423	14737	1690	1670	3360	11004	7093	18097

3.1.3.3 Extension Functionaries:

Out of a total of 245 courses organized for 9874 extension functionaries. Integrated pest management was the major training area with 30 courses and 1210

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 62:

Table 62: Training courses organized for extension functionaries

Training Area	Courses (no.)	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Integrated pest management	30	736	289	1025	127	58	185	863	347	1210
Productivity enhancement in field crops	26	760	114	874	73	29	102	833	143	976
Value Additon	18	377	400	777	8	16	24	385	416	801
Integrated nutrient management	17	365	106	471	46	36	82	411	142	553
Women and child care	17	327	396	723	91	147	238	418	543	961
Soil health management	16	342	213	555	89	64	153	431	277	708
Capacity building for ICT application	13	218	99	317	33	29	62	251	128	379
Production and use of organic inputs	13	210	76	286	2	25	27	212	101	313
Integrated farming system	13	254	107	361	37	20	57	291	127	418
Household food security	12	123	189	312	13	16	29	136	205	341
Livestock feed and fodder production	11	416	110	526	137	40	177	553	150	703
Capacity building	10	63	32	95	22	12	34	85	44	129
Recent Trends in production technology	8	208	164	372	9	7	16	217	171	388
Management in farm animals	7	391	16	407	8	11	19	399	27	426
Rejuvenation of old orchards	6	356	0	356	0	8	8	356	8	364
Group dynamics and farmers organization	5	87	49	136	0	10	10	87	59	146
Protected cultivation technology	5	181	59	240	35	30	65	216	89	305
Capacity building for input dealers	04	85	13	98	7	2	9	92	15	107
Floriculture	4	194	94	288	39	61	100	233	155	388
Formation and management of SHGs	4	27	69	96	4	26	30	31	95	126
Information networking among farmers	4	31	46	77	12	1	13	43	47	90
Farm mechanization	2	26	16	42	0	0	0	26	16	42
Grand Total	245	5777	2657	8434	792	648	1440	6569	3305	9874

State-wise break up of training courses organized for extension functionaries (Table 63) depicts that KVKs in Karnataka organized 159 courses in which 6579

functionaries participated, whereas KVKs in Kerala organized 86 courses for 3295 functionaries.

Table 63: State-wise break-up of the training courses conducted for extension functionaries

State/UT	Courses (no.)	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	159	4332	1144	5476	660	443	1103	4992	1587	6579
Kerala	86	1445	1513	2958	132	205	337	1577	1718	3295
Total	245	5777	2657	8434	792	648	1440	6569	3305	9874

3.1.3.4 Sponsored Programs

Besides the regular training courses, 529 sponsored trainings were conducted by the KVKs in different areas for the benefit of 20356 participants (Table 64). More number

of training courses (68) were organized on soil health and fertility management with the participation of 2802 farmers/rural youth/extension functionaries followed by capacity building and group dynamics with 57 programs.



Sponsored training programme on balanced nutrition

Table 64: Sponsored training courses organized

Training Area	Courses (no.)	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Soil health and fertility management	68	1651	367	2018	652	132	784	2303	499	2802
Capacity Building and Group Dynamics	57	959	704	1663	105	107	212	1064	811	1875
Value Addition	55	538	712	1250	54	224	278	592	936	1528
Economic empowerment of women	45	123	1097	1220	23	327	350	146	1424	1570
Increasing production and productivity of crops	38	926	225	1151	248	89	337	1174	314	1488



Crop production and management	25	947	99	1046	66	16	82	1013	115	1128
Commercial production of vegetables	24	885	154	1039	59	22	81	944	176	1120
Integrated water management	19	604	239	843	100	71	171	704	310	1014
Production of Inputs at site	16	207	180	387	99	52	151	306	232	538
Beekeeping	14	366	96	462	39	29	68	405	125	530
Methods of protective cultivation	12	494	62	556	53	10	63	547	72	619
Fruit Plants	12	189	106	295	77	36	113	266	142	408
Household nutritional security	10	89	198	287	39	40	79	128	238	366
Spices crops	9	322	101	423	60	28	88	382	129	511
Integrated pest management	9	257	45	302	69	13	82	326	58	384
Farm mechanization	9	111	88	199	33	55	88	144	143	287
Animal Nutrition Management	7	53	243	296	53	55	108	106	298	404
plant protection	6	264	19	283	36	0	36	300	19	319
Dairy Management	6	18	118	136	1	46	47	19	164	183
Income generation activities	6	110	61	171	14	18	32	124	79	203
Organic farming	5	96	75	171	19	9	28	115	84	199
Mushroom production techniques	5	73	77	150	7	7	14	80	84	164
Integrated Farming System	5	80	22	102	2	0	2	82	22	104
Cropping systems	5	98	128	226	9	3	12	107	131	238
Animal Disease Management	5	80	49	129	22	13	35	102	62	164
Scientific goat rearing	4	50	62	112	0	0	0	50	62	112
Post harvest technology and value addition	4	93	66	159	55	49	104	148	115	263
Integrated Pest and Disease Management	4	122	48	170	18	10	28	140	58	198
Integrated crop management	4	131	62	193	0	0	0	131	62	193
Home Science	4	60	15	75	80	12	92	140	27	167
Fisheries Management	4	188	25	213	65	22	87	253	47	300
Sericulture	3	35	2	37	18	0	18	53	2	55
Ornamental plants	3	43	14	57	5	3	8	48	17	65
NURSERY MANAGEMENT	3	15	48	63	6	13	19	21	61	82
Integrated disease management	3	51	25	76	26	7	33	77	32	109
Entrepreneurial development of farmers / youths	3	77	53	130	0	0	0	77	53	130
Crop Diversification	3	101	0	101	17	0	17	118	0	118
Cookery Total	3	0	63	63	0	21	21	0	84	84
Seed production	3	11	33	44	2	6	8	13	39	52
Poultry	3	58	5	63	14	0	14	72	5	77
Vermicompost production	2	27	5	32	7	11	18	34	16	50
Rural Craft	2	17	13	30	6	9	15	23	22	45
Livestock production and management	2	45	49	94	9	7	16	54	56	110
Total	529	10664	5853	16517	2267	1572	3839	12931	7425	20356

The State-wise break-up of sponsored programs is provided in Table 65. A total of 366 courses were organized in Karnataka benefiting 14255 participants, followed by 163 in Kerala with 6101 participants. The women participation was better in Kerala reflecting the interest shown by women in farming.

Table 65: State/Union Territory-wise break-up of the sponsored programs

State/UT	Courses (No.)	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	366	8157	3487	11644	1680	931	2611	9837	4418	14255
Kerala	163	2507	2366	4873	587	641	1228	3094	3007	6101
Total	529	10664	5853	16517	2267	1572	3839	12931	7425	20356

3.1.3.5 Vocational Programs:

This is an important area of training where the focus is to impart skills and enable the trainees to earn or supplement his/her livelihood. A total of 156 training courses were organized during the year involving 4492 budding entrepreneurs. Among the different vocations,

integrated crop management was the major area of training with 16 courses for with 556 participants. Value addition (13 courses, 425 participants) and Dairy farming (11 courses, 217 participants) were the other major areas. Details are provided in Table 66.



Vocational training on plant propagation

Table 66: Vocational training courses organized

Training Area	Courses (No.)	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Integrated crop management	16	280	202	482	35	39	74	315	241	556
Seed production	2	30	2	32	10	0	10	40	2	42
Value addition	13	151	169	320	51	54	105	202	223	425
Dairy farming	11	149	43	192	15	10	25	164	53	217
Production of bio-agents, bio-pesticides	10	109	26	135	6	6	12	115	32	147
Capacity building and group dynamics	10	90	164	254	1	0	1	91	164	255



Skill Development Training of Gardeners	9	74	116	190	5	6	11	79	122	201
Nursery, grafting etc.	8	42	59	101	15	11	26	57	70	127
Mushroom cultivation	8	58	22	80	19	2	21	77	24	101
Commercial vegetable production	8	117	33	150	41	23	64	158	56	214
Repair and maintenance of farm machinery	7	107	80	187	16	19	35	123	99	222
Vermi-composting	6	115	64	179	26	16	42	141	80	221
Planting Material Production	6	89	100	189	75	70	145	164	170	334
Sheep and goat rearing	5	161	7	168	71	1	72	232	8	240
Poultry farming	5	41	70	111	4	6	10	45	76	121
Apiculture	5	113	32	145	7	11	18	120	43	163
Tailoring, stitching, embroidery, dying etc.	4	2	65	67	0	7	7	2	72	74
Organic farming Total	4	61	7	68	15	6	21	76	13	89
Nursery management	4	30	44	74	14	21	35	44	65	109
Rural Crafts	2	6	29	35	6	18	24	12	47	59
Piggery	2	18	36	54	5	1	6	23	37	60
Floriculture cultivation	2	21	36	57	0	0	0	21	36	57
Fisheries	2	54	3	57	8	0	8	62	3	65
Sericulture	1	13	0	13	2	0	2	15	0	15
Production of bio-agents, bio-pesticides	1	10	8	18	8	4	12	18	12	30
Organic farming	1	0	231	231	0	0	0	0	231	231
Jack fruit processing	1	5	20	25	0	0	0	5	20	25
Integrated pest management	1	36	0	36	8	0	8	44	0	44
Good agricultural practices	1	7	21	28	3	1	4	10	22	32
Bakery Product Preparation	1	0	16	16	0	0	0	0	16	16
Total	156	1989	1705	3694	466	332	798	2455	2037	4492

Summary of state-wise vocational training conducted by the KVKs is presented in Table 67. Kerala KVKs conducted more number (96 courses with 2417 participants) of vocational programs than in Karnataka (60 courses with

2075 participants). Out of the total of 4492 participants, 798 represented the SC/ST category (17.8 %). Extent of women participation was high in Kerala (1231 out of 2417, 50.94%), compared to Karnataka.

Table 67: 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
Karnataka	60	981	661	1642	288	145	433	1269	806	2075
Kerala	96	1008	1044	2052	178	187	365	1186	1231	2417
Total	156	1989	1705	3694	466	332	798	2455	2037	4492

The summary of state-wise number of training courses under different categories of participants is given in Table

68 and the participation details of these courses based on gender are given in Table 69.



Table 68 : State-wise number of training courses organized for different category of participants

Farmers and Farm Women (On+Off)	Courses (No.)	Participants (No.)		
		General	SC/ST	Total
Karnataka	2264	67602	17907	85509
Kerala	938	30787	4758	35545
Total	3202	98389	22665	121054
Rural Youth (On+Off)				
Karnataka	231	5967	1219	7186
Kerala	353	8770	2141	10911
Total	584	14737	3360	18097
Extension Functionaries (On+Off)				
Karnataka	159	5476	1103	6579
Kerala	86	2958	337	3295
Total	245	8434	1440	9874
Sponsored Programmes				
Karnataka	366	11644	2611	14255
Kerala	163	4873	1228	6101
Total	529	16517	3839	20356
Vocational Programmes				
Karnataka	60	1642	433	2075
Kerala	96	2052	365	2417
Total	156	3694	798	4492
All Programmes				
Karnataka	3080	92331	23273	115604
Kerala	1636	49440	8829	58269
GRAND TOTAL	4716	141771	32102	173873

Table 69 : State-wise number of training courses and gender representation in different categories of training

Farmers and Farm Women (On+Off)	Courses (No.)	Participants (No.)		
		Men	Women	Total
Karnataka	2264	62537	22972	85509
Kerala	938	21278	14267	35545
Total	3202	83815	37239	121054
Rural Youth (On+Off)				
Karnataka	231	5349	1837	7186
Kerala	353	5655	5256	10911
Total	584	11004	7093	18097
Extension Functionaries (On+Off)				
Karnataka	159	4992	1587	6579
Kerala	86	1577	1718	3295
Total	245	6569	3305	9874
Sponsored Programmes				
Karnataka	366	9837	4418	14255
Kerala	163	3094	3007	6101
Total	529	12931	7425	20356

Vocational Programmes				
Karnataka	60	1269	806	2075
Kerala	96	1186	1231	2417
Total	156	2455	2037	4492
All Programmes				
Karnataka	3080	83984	31620	115604
Kerala	1636	32790	25479	58269
Grand Total	4716	116774	57099	173873

3.1.4 Frontline Extension Activities

Organization of extension activities is carried out by the KVKs in Zone XI to create awareness among farmers, extension personnel, other stakeholders and public about various technologies in agriculture and allied sectors. Details are described below:

- (a) **State wise:** Extension activities carried out by KVKs in Zone XI during the reporting year are presented in Table 70. Data indicate that a total of 90126 extension activities were carried out by KVKs

in the Zone through different methods and means wherein 1824080 farmers, 243839 SC/ST farmers and 102851 extension personnel participated. State wise data shows that 64163 extension activities were carried out by KVKs of Karnataka with the participation of 1451042 farmers, 188804 SC/ST farmers and 75817 extension personnel whereas, KVKs of Kerala conducted 25963 activities with the participation of 373038 farmers, 55035 SC/ST farmers and 27034 extension personnel.

Table 70 : Extension activities carried out by KVKs in Zone XI

States	Programmes (No.)	General Participants (No.)			SC/ST Participants (No.)			Extension Personnel (No.)		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	64163	1111049	339993	1451042	132302	56502	188804	58965	16852	75817
Kerala	25963	180999	192039	373038	29401	25634	55035	15051	11983	27034
Total	90126	1292048	532032	1824080	161703	82136	243839	74016	28835	102851

- (b) **Activity wise:** Extension activities carried out by KVKs in Karnataka, Kerala and for the zone are presented in Table 71 to 73, respectively. KVKs in Karnataka (Table 71) carried out 26907 advisory services and KVKs in Kerala (Table 72) organized

12824 advisory services. The corresponding data for farmers visit is 23704 in Karnataka and 8611 in Kerala. Scientists visit to farmers field were 7215 in Karnataka and 2230 in Kerala.

Table 71: Different extension activities carried out by KVKs in Karnataka

Activities	Programmes (No.)	General Participants (No.)			SC/ST Participants (No.)			Extension Personnel (No.)		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Advisory Services	26907	38523	7893	46416	6327	2008	8335	2817	1308	4125
Animal/plant health camps	523	13890	1350	15240	1971	606	2577	300	132	432
Any Others	159	7184	3299	10483	715	483	1198	1104	308	1412
Celebration of Important Days	373	16401	8105	24506	4465	2599	7064	2913	1081	3994
Diagnostic visits	961	4659	900	5559	946	266	1212	1587	159	1746
Exhibitions	121	587238	184490	771728	54654	27148	81802	12498	5442	17940
Exposure Visits	275	8580	2095	10675	1833	753	2586	1460	113	1573
Ex-trainees Sammelan	6	159	70	229	37	34	71	3	2	5



Farm Science Club Conveners meet	7	234	4	238	45	6	51	23	8	31
Farmers Seminars	46	3524	5610	9134	592	305	897	433	128	561
Farmers visit to KVK	23704	33264	8612	41876	6760	2467	9227	6117	1691	7808
Field Days	236	8671	1913	10584	2339	642	2981	1409	311	1720
Film Shows	411	8076	2337	10413	1881	728	2609	3766	370	4136
Group meetings	443	7126	2030	9156	1633	996	2629	3159	816	3975
Kisan Ghosthi	53	5677	1243	6920	1094	543	1637	560	141	701
Kisan Melas	41	283231	81432	364663	29760	8051	37811	5500	1358	6858
Lectures delivered as resource persons	1727	54926	19146	74072	11392	5793	17185	10943	2438	13381
Method Demonstrations	716	9713	2956	12669	1963	875	2838	1365	360	1725
Scientists visit to farmers field	7215	15190	3426	18616	2489	851	3340	1893	404	2297
Self Help Group Conveners meetings	62	466	1672	2138	187	819	1006	89	80	169
Soil health/test Campaigns	79	3190	676	3866	758	282	1040	560	69	629
Workshops	98	1127	734	1861	461	247	708	466	133	599
Total	64163	1111049	339993	1451042	132302	56502	188804	58965	16852	75817

Table 72 : Different extension activities carried out by KVKs in Kerala

Activities	Programmes (No.)	General Participants (No.)			SC/ST Participants (No.)			Extension Personnel (No.)		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Advisory Services	12824	11858	6386	18244	2621	1370	3991	935	1087	2022
Animal/plant health camps	133	1122	740	1862	147	146	293	75	51	126
Diagnostic visits	589	982	475	1457	224	121	345	165	125	290
Exhibitions	78	95716	140204	235920	18110	17201	35311	8063	6315	14378
Exposure visits	73	1100	499	1599	196	114	310	30	19	49
Ex-trainees Sammelan	19	271	150	421	22	59	81	23	17	40
Farm Science Club Conveners meet	9	318	95	413	40	13	53	9	7	16
Farmers Seminars	102	5865	3352	9217	764	578	1342	516	245	761
Farmers visit to KVK	8611	22322	14285	36607	1961	1563	3524	777	414	1191
Field Days	78	1517	842	2359	167	223	390	182	141	323
Film Shows	134	2029	933	2962	80	33	113	77	53	130
Group meetings	143	2141	2009	4150	242	355	597	547	889	1436
Kisan Ghosthi	21	705	363	1068	83	73	156	108	108	216
Kisan Melas	27	13807	7236	21043	1929	1185	3114	1527	463	1990
Lectures delivered as resource persons	193	5323	4013	9336	754	625	1379	464	347	811
Method Demonstrations	416	3424	2194	5618	286	288	574	124	134	258
Scientists visit to farmers fields	2230	4409	2114	6523	512	385	897	381	401	782



Self Help Group Conveners meetings	55	185	466	651	27	322	349	6	89	95
Soil health/test Campaigns	41	1088	609	1697	160	110	270	38	44	82
Workshops	41	1056	503	1559	61	40	101	61	78	139
Any Others	45	1095	634	1729	110	154	264	456	467	923
Celebration of important days	101	4666	3937	8603	905	676	1581	487	489	976
Total	25963	180999	192039	373038	29401	25634	55035	15051	11983	27034

Data in Table 73 is for the Zone as a whole, wherein a total of 39731 advisory services, 32315 farmers visit to KVKs and 9445 scientists visit to farmers fields were the outreach activities. Besides 1920 lectures delivered as resource persons, KVKs were involved in 1550 diagnostic visits, 1132 method demonstrations, 656 animal/plant health camps and 586 group meetings. Other activities included 545 film shows, 474 celebration of important days, 348 exposure visits, 314 field days, 199 exhibitions,

148 farmers seminars, 139 workshops, 120 soil health/test campaigns, 117 self help group conveners meetings, 74 kisan ghosthi, 68 kisan melas, 25 ex-trainees sammelan, 16 farm science club conveners meet and 204 other extension activities like Swachh Bharat Abhiyan. All these activities put together benefited 1824080 farmers belonging to general category, 243839 SC/ST farmers and 102851 extension personnel.

Table 73 : Different extension activities carried out by KVKs in Zone XI

Activities	Programmes (No.)	General Participants (No.)			SC/ST Participants (No.)			Extension Personnel (No.)		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Advisory Services	39731	50381	14279	64660	8948	3378	12326	3752	2395	6147
Animal/plant health camps	656	15012	2090	17102	2118	752	2870	375	183	558
Any Others	204	8279	3933	12212	825	637	1462	1560	775	2335
Celebration of important days	474	21067	12042	33109	5370	3275	8645	3400	1570	4970
Diagnostic visits	1550	5641	1375	7016	1170	387	1557	1752	284	2036
Exhibitions	199	682954	324694	1007648	72764	44349	117113	20561	11757	32318
Exposure Visits	348	9680	2594	12274	2029	867	2896	1490	132	1622
Ex-trainees Sammelan	25	430	220	650	59	93	152	26	19	45
Farm Science Club Conveners meet	16	552	99	651	85	19	104	32	15	47
Farmers Seminars	148	9389	8962	18351	1356	883	2239	949	373	1322
Farmers visit to KVK	32315	55586	22897	78483	8721	4030	12751	6894	2105	8999
Field Days	314	10188	2755	12943	2506	865	3371	1591	452	2043
Film Shows	545	10105	3270	13375	1961	761	2722	3843	423	4266
Group meetings	586	9267	4039	13306	1875	1351	3226	3706	1705	5411
Kisan Ghosthi	74	6382	1606	7988	1177	616	1793	668	249	917
Kisan Melas	68	297038	88668	385706	31689	9236	40925	7027	1821	8848
Lectures delivered as resource persons	1920	60249	23159	83408	12146	6418	18564	11407	2785	14192
Method Demonstrations	1132	13137	5150	18287	2249	1163	3412	1489	494	1983



Scientists visit to farmers fields	9445	19599	5540	25139	3001	1236	4237	2274	805	3079
Self Help Group Conveners meetings	117	651	2138	2789	214	1141	1355	95	169	264
Soil health/test Campaigns	120	4278	1285	5563	918	392	1310	598	113	711
Workshops	139	2183	1237	3420	522	287	809	527	211	738
Total	90126	1292048	532032	1824080	161703	82136	243839	74016	28835	102851

(c) **Mass contact:** Extension activities carried out for mass contact by KVKs of Zone XI are presented in Table 74. The state wise analysis of data indicates that newspaper coverage, extension literature and radio talks were the major activities in both the states. Zone level pooled data shows that KVKs carried out 3465 extension activities of mass contact of which large number of activities were covered through 1307 news items published in local and national dailies. Further, KVK scientists published

844 extension literature and 433 popular articles during the year. KVKs were also participated in radio talks (405), TV talks (209) and exhibitions (199). It is worth to mention here that KVKs of Karnataka have participated in agricultural exhibitions and kisan melas organized as mega events annually by their respective host organizations where in lakhs of farmers, extension personnel and other stakeholders took part.

Table 74: Extension activities carried out for mass contact by KVKs in Zone XI

Activity/Media type	Other extension activities in Zone XI (No.)		
	Karnataka	Kerala	Total
Exhibitions	121	78	199
Extension Literature	583	261	844
Kisan Melas	41	27	68
Newspaper coverage	853	454	1307
Popular articles	283	150	433
Radio talks	239	166	405
TV talks	135	74	209
Total	2255	1210	3465



Interaction of Hon'ble Prime Minister with Self-help group members through live telecast at KVK Ramanagara



Hon'ble Prime Minister in live web during Krishi Unnathi Mela by KVK Alappuzha



TV programme by KVK Vijayapura-I



Exhibition by KVK Kodagu



Providing soil health card to farmers by KVK Alappuzha



Pre-rabi campaign by KVK Wayanad



Animal health camp by KVK Kalaburagi-II



Jack fruit conclave by KVK Bengaluru Rural

3.1.5 Production of technological inputs

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

A) Seeds: State wise details pertaining to seed production by KVKs is presented in Tables 75. Data indicates that KVKs in Zone XI produced a total

of 3478.98 q of seeds of different crops of which KVKs in Karnataka produced 3313.19 q and KVKs in Kerala produced 165.79 q and supplied to 88130 farmers. KVKs of Karnataka produced more seeds of cereals (1582.11 q) followed by pulses (888.98 q), spices (305.11 q), oilseeds (210.36 q), millets (145.50 q), vegetables (131.48 q), fodder (35.55 q) and green manure (14.10 q) and supplied to 10250 farmers (Table 76). KVKs of Kerala also produced more seeds of cereals (77.15 q) followed by spices (43.28 q), tubers (30.08 q), vegetables (13.34 q) and pulses (1.94 q) and supplied to 77880 farmers (Table 77).



Data in Table 78 shows that Zone XI produced more quantity of seeds on cereals (1659.26 q) followed by pulses (890.91 q), spices (348.38 q), oilseeds (210.36

q), millets (145.50 q), vegetables (144.82 q), fodder (35.56 q), tubers (30.08 q) and green manure (14.10 q).

Table 75: State wise production of seeds by KVKs in Zone XI

State	Seeds		
	Quantity (q)	Worth (Rs.)	Farmers (No.)
Karnataka	3313.19	23351557	10250
Kerala	165.79	5015071	77880
Total	3478.98	28366628	88130

Table 76: Crop category wise production of seeds by KVKs in Karnataka

Crop category	Seeds		
	Quantity (q)	Worth (Rs.)	Farmers (No.)
Cereals	1582.11	5564385	619
Pulses	888.98	4444875	2489
Spices	305.11	3050368	45
Oilseeds	210.36	1167814	877
Millets	145.50	582000	705
Vegetables	131.48	6693570	5283
Fodder	35.55	1778025	204
Green manure	14.10	70520	28
Total	3313.19	23351557	10250

Table 77: Crop category wise production of seeds by KVKs in Kerala

Crop category	Seeds		
	Quantity (q)	Worth (Rs.)	Farmers (No.)
Cereals	77.15	308600	298
Spices	43.28	865600	2004
Tubers	30.08	60160	1676
Vegetables	13.34	3392911	72812
Pulses	1.94	387800	1090
Total	165.79	5015071	77880

Table 78 : Crop category wise production of seeds by KVKs in Zone XI

Crop category	Seeds		
	Quantity (q)	Worth (Rs.)	Farmers (No.)
Cereals	1659.26	5872985	917
Pulses	890.91	4832675	3579
Spices	348.38	3915968	2049
Oilseeds	210.36	1167814	877
Millets	145.50	582000	705
Vegetables	144.82	10086481	78095
Fodder	35.55	1778025	204
Tubers	30.08	60160	1676
Green manure	14.10	70520	28
Total	3478.98	28366628	88130



(B) Planting material: State wise details pertaining to production of planting material by KVKs is presented in Tables 79. Data indicates that KVKs in Zone XI produced a total of 2743107 number of plants of different crops of which KVKs in Karnataka produced 1744416 plants and KVKs in Kerala produced 998691 plants and supplied to 241424 farmers. KVKs of Karnataka produced fodder (953596) followed by vegetables (350010), plantation (175592), spices (119182), fruits (91434), flowers (34848), commercial (13670), medicinal and aromatic (3152), ornamental (2154) and forest species (778) and provided to 18320 farmers (Table 80). Whereas, KVKs of Kerala produced

more plants of spices (323841), followed by fruits (299874), vegetables (168434), fodder (150230), plantation (36977), flowers (9480), forest species (5473), ornamental plants (3245) and medicinal and aromatic (1137) and provided to 223104 farmers (Table 81).

Data in Table 82 shows that KVKs of Zone XI were produced more quantity of planting materials on Fodder (1103826), Vegetables (518444), Spices (443023), Fruits (391308), Plantation (212569), Flowers (44328), Commercial (13670), Forest Species (6251), Ornamental (5399) and Medicinal and Aromatic (4289).

Table 79: State wise production of planting material by KVKs in Zone XI

State	Planting material		
	Quantity (No.)	Worth (Rs.)	Farmers (No.)
Karnataka	1744416	19665202	18320
Kerala	998691	18810072	223104
Total	2743107	38475274	241424

Table 80 : Crop category wise production of planting material by KVKs in Karnataka

Crop category	Planting material		
	Quantity (No.)	Worth (Rs.)	Farmers (No.)
Fodder	953596	1013876	7738
Vegetables	350010	2737056	1664
Plantation	175592	9077220	3707
Spices	119182	2719720	2268
Fruits	91434	3535910	2415
Flowers	34848	385870	180
Commercial	13670	65900	14
Medicinal and Aromatic	3152	78800	155
Ornamental	2154	31400	149
Forest species	778	19450	30
Total	1744416	19665202	18320

Table 81 : Crop category wise production of planting material by KVKs in Kerala

Crop category	Planting material		
	Quantity (No.)	Worth (Rs.)	Farmers (No.)
Spices	323841	5774845	77025
Fruits	299874	10253370	83182
Vegetables	168434	339007	20676
Fodder	150230	150230	29822
Plantation	36977	1951645	4895
Flowers	9480	135400	3012
Forest Species	5473	136825	3652
Ornamental plants	3245	51720	684
Medicinal and Aromatic	1137	17030	156
Total	998691	18810072	223104



Table 82 : Crop category wise production of planting material by KVKs in Zone XI

Crop category	Planting material		
	Quantity (No.)	Worth (Rs.)	Farmers (No.)
Fodder	1103826	1164106	37560
Vegetables	518444	3076063	22340
Spices	443023	8494565	79293
Fruits	391308	13789280	85597
Plantation	212569	11028865	8602
Flowers	44328	521270	3192
Commercial	13670	65900	14
Forest Species	6251	156275	3682
Ornamental	5399	83120	833
Medicinal and Aromatic	4289	95830	311
Total	2743107	38475274	241424

(C) **Hybrids:** State and crop wise details pertaining to production of plants material of hybrids by KVKs is presented in Tables-80 and 81, respectively. Data in Table-83 indicates that KVKs produced 472216 number of hybrid plants of which KVKs in Karnataka produced 214900 and KVKs in Kerala produced 257316. Further, KVKs of Karnataka produced more number of plants of marigold (90000) followed by chillies (60000), tomato (30000),

brinjal (22228) and papaya (12672) KVKs in Kerala, produced cauliflower (141159) cabbage (108871), chillies (4145), marigold (2500) and papaya (641). Thus, in Zone XI, more number of seedlings of cauliflower (141159), followed by cabbage (108871), marigold (92500), chillies (64145), tomato (30000), brinjal (22228) and papaya (13313), were produce and provided to farmers (Table 84).

Table 83: State and crop wise production of planting material of hybrids by KVKs in Zone XI

State	Crop	Planting material of hybrids		
		Quantity (No.)	Worth (Rs.)	Farmers (No.)
Karnataka	Marigold	90000	180000	1600
Karnataka	Chilli	60000	120000	800
Karnataka	Tomato	30000	60000	10
Karnataka	Brinjal	22228	44456	500
Karnataka	Papaya	12672	190080	250
Total		214900	594536	3160
Kerala	Cauliflower	141159	423477	18171
Kerala	Cabbage	108871	326613	15469
Kerala	Chilli	4145	12435	1438
Kerala	Marigold	2500	7500	2500
Kerala	Papaya	641	16025	177
Total		257316	786050	37755
Grand total		472216	1380586	40915

Table 84: Crop wise production of planting material of hybrids by KVKs in Zone XI

Crop	Planting material of hybrids		
	Quantity (No.)	Worth (Rs.)	Farmers (No.)
Cauliflower	141159	423477	18171
Cabbage	108871	326613	15469
Marigold	92500	187500	4100
Chilli	64145	132435	2238
Tomato	30000	60000	10
Brinjal	22228	44456	500
Papaya	13313	206105	427
Total	472216	1380586	40915

(D) Bio-products: State and category wise details pertaining to production of bio products by KVKs in Zone XI is presented in Tables 85. It indicates that KVKs in Zone XI produced a total of 3182.71 q of bio-products of which KVKs in Karnataka produced 1276.55 q and KVKs in Kerala produced 1906.16 q. Further, it shows that KVKs of Karnataka produced more of micro nutrient mixture (571.79 q) followed by organic manures (314.90 q), bio-fertilizers (238.99 q), bio-fungicides (89.15 q), bio-pesticides (57.73 q), bi-agents (2.23 q) and mushroom spawn (1.77 q). Whereas, KVKs of Kerala produced more of bio-fungicides (672.64

q) followed by organic manures (377.36 q), bio-pesticides (345.89 q), bio-fertilizers (231.46 q), micro nutrient mixture (142.07 q), bi-agents (118.98 q) and mushroom spawn (17.75 q). Overall, KVKs of Zone XI produced largest quantity on bio-fungicides (761.79 q) followed by micro nutrient mixture (713.86 q), organic manures (692.26 q), bio-fertilizers (470.44 q), bio-pesticides (403.62 q), bi-agents (121.21 q), mushroom spawn (19.52 q) and provided to 165250 farmers. Further, KVKs produced 28664 number of pheromone traps, 32500 EPN (Entomo Pathogenic Nematode), and 681 tricho cards (Table 86).

Table 85: State and category wise production of bio products by KVKs in Zone XI

Bio-products category	Karnataka			Kerala			Total		
	Quantity (q)	Worth (Rs.)	Farmers (No.)	Quantity (q)	Worth (Rs.)	Farmers (No.)	Quantity (q)	Worth (Rs.)	Farmers (No.)
Bi-agents	2.23	74900	226	118.98	188984	409	121.21	263884	635
Bio-fertilizers	238.99	2975365	3981	231.46	1377663	44516	470.44	4353028	48497
Bio-fungicides	89.15	883020	2916	672.64	6726406	27916	761.79	7609426	30832
Bio-pesticides	57.73	836360	2428	345.89	5449740	43438	403.62	6286100	45866
Micro nutrient mixtures	571.79	8576850	6707	142.07	2131046	12015	713.86	10707896	18722
Mushroom spawn	1.77	141260	173	17.75	1420248	2667	19.52	1561508	2840
Organic manures	314.90	425934	1200	377.36	377360	16658	692.26	803294	17858
Total	1276.55	13913689	17631	1906.16	17671446	147619	3182.71	31585135	165250

Table 86 : Production of other bio-products by KVKs in Zone XI

Category	Other Bio-products		
	Quantity (No.)	Worth (Rs.)	Farmers (No.)
Pheromone traps	28664	2866400	6061
EPN	32500	195000	1850
Tricho cards	681	23835	164
Total	61845	3085235	8075



(E) **Livestock and fisheries** : State and category wise details pertaining to production of livestock and fisheries by KVKs is presented in Tables 87 and 88, respectively. Data in Table-87 indicates that KVKs in Zone XI produced 234818 number of livestock and fisheries of which KVKs in Karnataka produced 35533 and KVKs in Kerala produced 199285. Further, it shows that KVKs of Karnataka produced more on poultry chicks(20965) followed by fish fingerlings (13808), poultry eggs (300), sheep

& goat kids (211), piggery (191), dairy calves (46), and rabbit bunnies (12). Whereas in case of KVKs of Kerala, it was on Fish fingerlings (102685) followed by poultry chicks (95332), poultry eggs (981), sheep & goat (281) and dairy calves (6). Out of total production, maximum number (116493) was under fish fingerlings followed by poultry chicks(116297), poultry eggs (1281), sheep and goat kids (492), pig lets (191), dairy calves (52) and rabbit kits (12) (Table 88).

Table 87: State wise production of livestock and fish fingerlings by KVKs in Zone XI

State	Livestock / fish	Livestock and fish		
		Quantity (No.)	Worth (Rs.)	Farmers (No.)
Karnataka	Poultry chicks	20965	1561010	1570
Karnataka	Fish fingerlings	13808	27616	43
Karnataka	Poultry eggs	300	900	25
Karnataka	Sheep lambs & goat kids	211	844000	67
Karnataka	pig lets	191	573000	86
Karnataka	Dairy calves	46	664000	13
Karnataka	Rabit kids	12	4200	5
Total		35533	3674726	1809
Kerala	Fish fingerlings	102685	317240	1109
Kerala	Poultry	95332	7671958	7601
Kerala	Poultry eggs	981	2943	87
Kerala	Sheep & Goat	281	1124000	57
Kerala	Dairy animals	6	90000	358
Total		199285	9206141	9212
Grand Total		234818	12880867	11021

Table 88: Category wise production of livestock and fish fingerlings by KVKs in Zone XI

Category	Livestock and fish		
	Quantity (No.)	Worth (Rs.)	Farmers (No.)
Fish fingerlings	116493	344856	1152
Poultry chicks	116297	9232968	9171
Poultry eggs	1281	3843	112
Sheep lambs & goat kids	492	1968000	124
Piglets	191	573000	86
Dairy calves	52	754000	371
Rabit kits	12	4200	5
Total	234818	12880867	11021

(F) **Technological inputs at a glance:** Summary of technological inputs which includes seeds, planting materials, bio-products, livestock and fish fingerlings by KVKs of Zone XI are presented in Table 89. It indicated that KVKs produced 3478.98 q seeds of

crops 3182.71 q bio-products, 27.43 lakh number of plants 4.72 lakh number of plants of hybrids and 2.35 lakh number of livestock and fish fingerlings and supplied to 5.45 lakh farmers.

Table 89: Production of technological inputs by KVKs of Zone XI

Category	Technological inputs		
	Quantity	Worth (Rs. in lakh)	Farmers (No. in lakh)
Seeds of crop varieties (q)	3478.98	283.67	0.88
Bio-products (q)	3182.71	315.85	1.65
Bio-products (No. in lakh)	0.62	30.85	0.08
Planting materials of crops (No. in lakh)	27.43	384.75	2.41
Planting materials of crop hybrids (No. in lakh)	4.72	13.80	0.40
Livestock and fisheries (No. in lakh)	2.35	128.81	0.11
Total		1157.73	5.54



Poultry unit at KVK, Bengaluru Rural



Sheep unit at KVK, Chikkaballapura



Nursery unit at KVK, Koppal



Dairy unit at KVK, Ramanagara



Nursery unit at KVK, Alappuzha



Poultry unit at KVK, Pathanamthitta



3.1.6 Kisan Mobile Advisory Services (KIMAS)

Kisan Mobile Advisory Service is one of the Information and Communication Technology (ICT) tools for dissemination of requisite and need based information at the right time to the needy people. KVKs are sending text information to registered farmers advising them on the issues of agricultural importance. During the reporting period, 41 KVKs have advised farmers regularly on the

areas of crops, livestock, other enterprises, weather, marketing and awareness of latest agricultural technologies through text messages depending on the expertise available with them. Altogether, 9706 text messages were sent to 35.70 lakh farmers. Most messaging was related to crops (4559) followed by weather (4091), awareness (494), other enterprises (232), livestock (221), and marketing (109). The details are presented in Table 90.

Table 90: Details of State-wise SMS/voice calls sent to various priority areas

Name of State	No of KVKs	Message Type	Number of farmers	Crop	Livestock	Weather	Marketing	Awareness	Other enterprise	Total
Karnataka	33	Text	2909099	1468	190	195	98	425	207	2583
Kerala	8	Text	661547	3091	31	3896	11	69	25	7123
Total	41	Text	3570646	4559	221	4091	109	494	232	9706

3.1.9 Soil, Water and Plant Analysis

KVKs have soil, water and plant analyzing laboratory and are carrying out the analysis of soil, water and plant samples for the benefit of farming community. KVKs are also utilizing this facility for soil test based nutrient recommendation for demonstrations and on farm trials besides, rendering advisory services on nutrient status

based recommendations to the farmers. During the year, a total of 49665 samples of soil, water, plant, and organic manure received from 46423 farmers belonging to 23783 villages were analyzed. (Table 91). 30479 Soil Health Cards were distributed to farmers. State-wise data showed that KVKs in Karnataka analyzed 43317 samples followed by 6348 samples in Kerala (Table 92).

Table 91: Details of samples analyzed during 2018-19

Type of sample	Samples (No.)	Farmers (No.)	Villages (No.)
Soil samples	34586	32247	14955
Water samples	14742	13899	8769
Plant samples	241	207	17
Manure & Lime samples	96	70	42
Total	49665	46423	23783

Table 92: State-wise soil, water, plant analysis undertaken during 2018-19

Type of sample	Samples (No.)	Farmers (No.)	Villages (No.)
Karnataka	43317	41359	23474
Kerala	6348	5064	309
Total	49665	46423	23783

World Soil Day Celebration

World Soil Day was celebrated on 5.12.2018 at 44 KVKs of the Zone with participation of 7489 farmers, 42 VIPs including ministers, MP and MLAs, 132 other public representatives, and 337 officials. During the occasion, 4509 soil health cards were distributed. The celebration of world soil day was covered through 118 media coverages in the zone.

3.1.10 Rainwater Harvesting Units

Rainwater harvesting units with micro irrigation system have been established in 16 KVKs. A total of 52 training courses and 75 demonstrations were conducted and 216749 planting material were produced utilizing this facility. Further, 19740 farmers and 1723 officials visited these units and got acquainted with the rainwater harvesting techniques.



3.1.9 Convergence and Linkages

During the period under report, KVKs continued their linkage with various organizations and agencies while discharging their responsibilities as agricultural science centres at the district level. Technical backstopping required for successful implementation of various schemes and programmes was the major responsibility of the KVKs. KVKs worked closely with most of the development departments for sharing technology and information through bi-monthly workshops, seminars, technology weeks, frontline demonstrations, field days, farmers-scientists interface and kisan goshti/ mela. Capacity development of extension personnel was ensured through training, farm schools and farmers field schools. Extension activities involved all stakeholders including media, local institutions, district administration and people's representatives. Diagnostic field visits and joint field visits to problematic fields helped the development department officials and farmers to identify emerging problems.

Convergence through Agricultural Technology Management Agency (ATMA): Convergence with ATMA enabled KVKs to promote various technologies in their respective districts. Details given in Table 93 substantiate the activities through which ATMA platform was used to achieve convergence. Altogether, KVKs participated in 1259 programmes organized by ATMA and at the same time KVKs organized 623 programmes in collaboration with ATMA.

Table 93: Details of linkages with ATMA by KVKs

Programmes	Programs attended by KVK staff (No.)	Programs organized by KVK staff (No.)
Meetings	226	39
Research projects	21	10
Training programmes	398	149
Demonstrations	112	200
Extension programmes	99	56
Technology week	20	19
Exposure visit	74	23
Exhibition	72	24
Soil health camps	31	20
Animal health campaigns	12	11
Farmers field school	45	6

Capacity development	17	9
Kisan mela	56	15
Agri-preneurs development	10	2
Video films	35	9
Watershed approach	8	14
Extension literature	23	17
Total	1259	623

External funding was received by the KVKs to organize various programs and activities. In terms of total amount received, support from the State Governments was high in both Karnataka and Kerala. In terms of number of KVKs supported, Rashtriya Krishi Vikas Yojana(RKVY), National and State Horticultural Mission, projects of various ICAR Institutes and National Bank for Agriculture and Rural Development (NABARD) were the major agencies that funded/supported KVK activities as detailed in the Table 94. Planning Board, Crop/Commodity Boards and Directorates also supported the KVK activities.

Table 94: Details of external funding received by KVKs through convergence and linkages.

Name of external funding Agency	KVKs (No.)	Amount Received (Rs. lakh)
Agricultural Technology Management Agency (ATMA)	15	53.588
Command Area Development Authority	1	16.02
Central Integrated Pest Management Centre, Bengaluru	1	0.93
Central Warehousing Corporation, Bengaluru	1	0.1
Coconut Development Board	4	5.335
Coffee Board, Hassan	1	0.4
CSS-Mission for Integrated Development of Horticulture	1	0.75
Department of Biotechnology	1	14.25
Directorate of Cashewnut & Cocoa Development, Kochi	1	5.45
DST- ISTD project (Swadeshi Science Movement-Kerala)	1	7
Government of Karnataka	9	104.002
Government of Kerala	4	25.786

GSP Crop Science Pvt Limited Ahemdabad	1	0.75
Hortcorp	1	0.2
ICAR Institutes	5	20.004
IINRG Ranchi	1	3.5
Integrated Watershed Management Programme	1	1.24
Janatha Agro products, Kota, Udupi district	1	2.29
Karnataka Agricultural Price Commission, Bangalore	4	70
Karnataka Forest Department	1	2.5
Karnataka State Bio-energy Development Board , Government of Karnataka	1	4
Karnataka State Department of Horticulture	18	97.98165
MANAGE, Hyderabad	19	127.255
National Bank for Agriculture and Rural Development (NABARD)	9	84.96046
National Fisheries Development Board	2	12.105
National Horticultural Mission	8	79.245
National Mission for Sustainable Agriculture (NMSA)	4	72.43595
Parijat Industries India Pvt Ltd., New Delhi	1	1.2
Powergrid Corporation Ltd	1	1.1
Rashtriya Krishi Vikas Yojana(RKVY)	4	15.8984
SCSP, CPCRI, Kasaragod	1	5
Smartchem Technologies LTD., Pune	1	1.2
Spice board	1	0.15
State Agricultural Universities	15	124.26
State Department of Agriculture	16	230.79258
State Department of Horticulture	1	3.0975
State Horticultural Mission	7	98.699
State Planning Board	4	98.3837
VIDYADHANAM, TRUST	1	1.35
Willowood Chemcials Pvt Ltd New Delhi, India	1	0.49947
Total		1393.70871

3.1.10 Cases of Large Scale Adoption and Success Stories

(a) Vegetable seedling production

The area Nedumkandam in Iddukki district is mostly regarded as a hub for vegetable cultivation. On the critical analysis of the scenario, it was found that initial input cost towards planting material which was sourced from a distant place was high. To cater this felt need, KVK Iddukki organized training programmes on vegetable seedling production and nursery management during 2013-14. Among the trainees, Ms. Manju Mathew belonging to Ullathu, Anjumukku, Valiyathovala established Vegetable seedling production unit in an area of 10 cents christened as Harithasree Nursery funded by district panchayat under the guidance of KVK Iddukki in December, 2014.

Initial years, Ms. Manju Mathew has struggled hard to move on with a minimum profit year by year. During the year 2018-19, her input cost for the 10 cent poly house was Rs. 7.12 lakh for producing 5 lakh seedlings with a net profit of Rs. 4.72 lakh per year. She further added rain shelters for hardening the plantlets. At present Harithasree Nursery provides employment to directly 50 rural youth and many multiples of it, indirectly with the increase in demand for quality vegetable seedlings at the right planting season ex-situ. Further, this unit reduced the cost of cultivation at the farmers end. Sales of this unit is an evidence for increase in seedling requirement in the vegetable growing area of Nedumkandam and adjoining blocks of Iddukki district. It also acts as a knowledge hub for trainings related to production of vegetable seedlings and nursery management for needy farmers.





A view of Harithasree Nursery unit

(b) Bush pepper in homesteads – add on for income

Black pepper, the “King of spices” is a major spice crop cultivated in Kozhikode district. It is mainly grown as an intercrop in coconut and arecanut gardens and also as a pure crop on various tree standards. Most of the farmers of the district are either marginal or small farmers and they are unable to take up cultivation of this export oriented crop on a large scale due to less farm holding size. Cultivation of bush pepper hence is a viable option wherein pepper can be grown without trailing on a standard tree in potted form in places where no land space is available especially in urban or semi urban areas. Bush pepper plants are multiplied by rooting of plagiotropic cuttings. Bush pepper in polybags is used as planting material. About six month old, 5-8 leaf stage plants were planted in 12 inch earthen pots. They were maintained in partial shade with organic inputs. The bush pepper plants will start yielding as early as six months onwards. It is expected to yield at least 150 g per plant after second year. The yield will be increased gradually as per plant management and high yield levels of 4 – 4.5 kg can be realized from 12 – 14 year old potted plants. It also ensures the availability of green pepper through the year.

In this backdrop, KVK, IISR, Kozhikode attempted to promote the production as well as cultivation through trainings, demonstrations etc. KVK organized as many as 17 training programmes on the technology during the last five years and trained 631 farmers. In addition, KVK also took up the production and sale of bush pepper plants to meet

the demand from farmers. A total of 16,698 plants were supplied to 1603 farmers mainly for homestead cultivation. Further, cultivation of bush pepper in pots was demonstrated in Naduvannur panchayat and the Grama Panchayat was convinced with the interventions and implemented as panchayat project in household level.

At present about 25 nursery units viz., Panakkavayal Agricultural Nursery, C/o Mr.George Thomas, Panakkvayal House, Koorachundu, Kozhikode; Ms.Preeja Suresh and group (six members), Peruvannamuzhi engaged in KVK for planting material production; Mr.Jojo Jacob, Randuplackal Horticultural Nursery, Kadiyangadu, Kozhikode; Harithasree Karshika nursery, Mananpoyil, Balussery (10 women under the leadership of Ms.Bindu; Jancy Thomas, Kunduthode, Kozhikode; Buds and Blooms, Chalikkara, Kozhikode; Buds and Blooms, Koothali, Kozhikode; Mr. Hamza, Koyilandi, Kozhikode; Mr.Muhammed, Poonoor, Balussery, Kozhikode; Saji Madathiparambil, Koorachundu, Kallanode; Xavier, Vazhppally, Koorachundu, Kozhikode; Binu John, Peruvannamuzhi, Kozhikode and Jaiva Karshika nurseries under block panchayats (13 Numbers) were started by KVK trainees over a period of time. The income of these units ranges from Rs.10,000 to Rs.15 lakh per year.

In addition, at household level, farmers are producing about 300 g to 4.5 kg green pepper per plant from various locations in Kozhikode district. This is sufficient for their internal requirement and a few sell surplus produce also. At Naduvannur panchayat, 684 households were given 10 plants each by Grama Panchayat and plants have started yielding. More Panchayats are presently impressed by these interventions and Krishi Bhavans like Velam in Kozhikode district, Muthuvalloor in Malappuram district were also procured about 2000 bush pepper each from KVK, Calicut and distributed to households. The technology is fast spreading to more locations. After convincing the technology Naduvannur panchayat implemented this as a project in 684 households. Velam Krishi Bhavans in Kozhikode district, Muthuvalloor in Malappuram district were procured 2000 bush pepper.



A view of yielding potted bush pepper and bush pepper nursery unit

(c) Rehabilitation of Black Pepper Gardens through participatory approach

Rehabilitation of pepper gardens in Cheruthazham Panchayat in an ecological and economically sustainable manner based on the findings of 'Sugandhi project' and the soil based nutrient management plan of KAU. The participatory mode development programme of black pepper resulted in formulating a team of Technician for black pepper, "SPISE" (Society for Pepper Improvement through Sustainable Employment) for combating labour crisis in pepper production to extend scientific services to manage black pepper in the panchayat. The project focuses to groom a scientifically dynamic team of pepper workers with high professional skill in soil and crop health management in pepper gardens. The pepper samithy with a team of technicians entitled "**SPISE**" will be able to undertake all farming operations in pepper gardens, when contacted by farmers. A novel group of 15 individuals were selected on the basis of their skill, knowledge and interest to take up field level activities in a proper scientific manner. These

workers are trained to put forth sustainable crop production and management activities in pepper with an aim of providing 200 man days/technician. In this direction, KVK Kannur was assigned by the Panchayat as a part of the project to train the team of Technician for black pepper. Trained teams undertaken field level operation, on contract basis as a group / individual according to situation as per the rate fixed for each work jointly by the technician group and SMSs of KVK. The services provided by the technician team are mainly related to taking up of new planting as well as management of existing gardens. The achievements are given below:

- Awareness campaign on ICM in pepper was convened in Cheruthazham and Kuttiyattur.
- Necessary equipments and implements were given to the technicians.
- Established two mother vine producing units with a capacity of producing 1000 meters of runner vine resulting in production of 40000 rooted cuttings.
- Established two Bush pepper production units.
- Managed 25 demonstration plots with an aim to withdraw plant protection chemicals.
- Bio control agents like Trichoderma and Pseudomonas were supplied as critical inputs with proper training to the farmers to manage the disease.
- Training on importance of crop health and plant nutrition through need based application of growth promoters and micro nutrients were advocated in fields showing deficiencies.
- Provided 2000 nucleus planting materials of Panniyur 2 and Panniyur 1 to the nursery owners.
- Provided critical inputs like, dolomite, Ayar(secondary and micro nutrient mixture), Coco peat, enriched coir pith compost, trichoderma and pseudomonas for maintaining mini nurseries.
- Within a span of two years, the project able to produce about 1.50 lakh pepper cuttings as well as 46000 serpentine cuttings.

- Established two mother vine progeny units with improved varieties of black pepper.



A view of laying out pepper nursery by Technician team under SPISE



A view of rehabilitation pepper gardens by Technician teams under SPISE

(d) Diamond back moth management in cabbage

Cabbage is one of the important vegetable crop of Karnataka and is being cultivated in an area of 447 ha with production of 12063t in Bengaluru Rural District. The average yield of cabbage in Bengaluru Rural District is 36 t/ha as against potential yield of 48 t/ha which accounts 25% lesser yield. This is mainly due to the damage caused by Diamond Back Moth (DBM) to the extent of 42% crop loss.

In this direction, KVK Bengaluru Rural disseminated technology of ICAR-IIVR, Varanasi for the management of Diamond Back Moth in cabbage among farmers of Rameswara village, Doddaballapura Taluk, Bengaluru Rural District through various interventions. Technology includes intercropping with mustard as trap crop at 25:2, installation of WOTA-T traps, use of sticky traps, spray of Bt (6ml/ltr), neem soap (5gm/ltr), entomopathogenic fungi (*Beauveria bassiana* @ 0.2%), emamectin benzoate 5 SG (0.05%), chloro fenapyr 10 SC (0.1%), and spinosad 2.5SC(0.15%). During 2018-19, technology has reached 340 farmers covering an area of 400 ha. By adopting this technology, farmers in Rameswara village could able to harvest 44.92 t/ha which gave net returns of Rs. 562480/ha whereas other farmers could harvest 38.72 t/ha which gave net returns of Rs. 378886 /ha. Thus the management of Diamond Back Moth effectively gave additional income of Rs.183594/ha. Further, this technology adoption has provided employment to approximately 2000 persons.



		
<p>Awareness on use of neem soap</p>	<p>Demonstration on use of Bt</p>	<p>Spraying of Bt formulation</p>
		
<p>WOTA trap installation</p>	<p>Installation of sticky traps</p>	<p>Field Observation</p>

(e) Bi-voltine silkworm hybrid FC₂ x FC₁

In recent years new silkworm hybrids respond well to increased use of inputs to achieve the potential yield levels. About 80% of the farmers in the district are rearing cross breed silkworm hybrid like PM X CSR₂. Cross breeds are hardy and have tremendous ability to survive under varied or fluctuating environmental climatic conditions. But its quality is at low when compared to the existing international standard and also low cocoon price in the market compare to bivoltine hybrid. In this direction, KVK, Kolar conducted front line demonstrations on rearing of double hybrid silkworm (FC₂ x FC₁) at Dinnehosahalli and Thoraganadoddi villages with identified farmers during 2015-16 and 2016-17. During demonstration, 3 step disinfection method was carried out for disinfection of silkworm rearing house, provided 2nd moult FC₂ x FC₁ healthy chawki worms, rearing of late age silkworm with optimal environmental condition, mountages & mounting care and also conducted several training programmes to address yield, quality and income related issues in a view to spread the technology. In fact, double hybrids have more genetic plasticity to buffer against adverse climatic conditions and thereby resulting in crop stability than single/cross hybrids. Hence, the demonstrated bivoltine hybrid brought quantitative and qualitative improvement in silk production as FC hybrids are more productive and robust which

can be easily reared by the farmers with appropriate rearing technology.

Results of FLDs motivated 85 sericulture farmers of these villages to shift from rearing of cross breed to bivoltine double hybrid FC₂ x FC₁ under the technical guidance of KVK.

The Bivoltine double hybrid FC₂ x FC₁ gave cocoon weight ranged from 2.00 – 2.40 gm, shell weight ranged from 0.450 – 0.550g, cocoon shell ratio ranged from 22-24 %, raw silk percentage ranged from 18-19 % as compared to PM x CSR₂ cross breed (single cocoon weight ranges from 1.80 – 1.90 gm, shell weight ranges from 0.320 – 0.350g, cocoon shell ratio ranges from 18-19 %, raw silk percentage ranges from 14-15 %). Bivoltine double hybrid FC₂ x FC₁ gave cocoon yield of 86.76 kg/100 DFLS with net returns of Rs. 23925/100 DFLS which is 40.38 per cent increase and 2.84 BCR as against the PM x CSR₂ cross breed with Cocoon yield of 79.64 kg/100 DFLS, net returns of Rs. 17063/100 DFLS and 2.35 BCR. Presently, the total cocoon production is more than 80 per cent obtained from FC₂ x FC₁ bivoltine hybrid in the FLD villages and this technology benefitted the farmers for increasing their income from sericulture.



A view of Bivoltine double hybrid cocoons

(f) Economic empowerment of women through Value addition

Women play a vital role in farming system and contribute substantially in the physical aspect of farming, livestock management, post-harvest and allied activities. India has achieved self sufficiency in agricultural production, but a considerable amount of food product gets spoiled every year due to improper post-harvest operations. On the other hand non-profitable cultivable land is transformed into industrial area. Thus people are facing problem for their livelihood and are in search of other alternatives. Big industries are trying to the nearby rural population of the industrial area through their CSR activity. In this context to uplift the livelihood and financial conditions of the rural women, value addition of foods can offer tremendous opportunity. In Ramanagara district, Bidadi is the biggest industrial area & many multinational companies have established. In this regard Hindustan Coco cola beverages pvt. ltd and its implementing partner Sarvodaya IRDS (NGO) approached KVK, Ramanagara for skill development & technical backstopping added products for SHG members from Mednahalli village of Bidadi Hobali, Ramanagara Taluk & district under its CSR activity. KVK organized on-campus training on value addition to horticultural produce for enhancing income for the SHG members of Mednahalli village.

The training imparted the knowledge on nutritional significance of horticultural crops, Scientific & hygienic preparation of value added products such as rice papad enriched with greens & chilli, Mixed fruit jam, Squash & puliyogare mix, Packaging, labeling, Branding, Licensing & Market linkage

Having gained the knowledge and skill, five of ex-trainees planned to establish a processing unit to prepare rice papad and puliyogere mix. They practiced the technology and collected the feedback before entering in to the market. Realizing the demand, they procured FSSAI license and branded their product as Shri Lakshmi Venkateshwara foods. Group is producing 150 kg of rice papad and 20 kg of puliyogere mix and selling to nearby catering units on regular basis. They are also marketing products to local shops, neighbours and consumers visiting melas and exhibitions with a profit of 40-45% (Rs.10000-11000) which has brought the additional income to the group members. Looking into employment generation, it takes 405hrs to produce 150kgs of rice papad & 50kgs of puliyogare mix. This created the employment for women Folk who have lost lands for multinational companies and are in search of livelihood alternatives. This has created the employment for women and brought the economic security. Each member contributes 3-4 hrs/day in production unit to produce the required quantity of value added products.

Production unit established at Mednahalli, Bidadi hobali, Ramanagara has brought economic empowerment to the group by appropriate utilization of skill and time with the technical guidance of KVK, Ramanagara. This has showed the way for other groups to take up such activity for sustained additional income to family. Even the Sarvodaya IRDS NGO is hand holding the group for production and market linkage.





A view of home scale processing unit
Success stories

(i) K.T Varghese - An NRI turned as poultry farmer

K.T Varghese was one of the many who left Kerala in search of an occupation to the middle East during the year 2000. Armed with an diploma in ITI, he became employed as mechanic and continued to work in gulf till 2009. He returned to Kerala in August 2009. Left with no job, and had a family to support. He took up an estate for rubber slaughter work and continued at this for three years .There was no much economic gain .However it was not a loss. So, after the third year he took up more rubber slaughter work. The second time he took up rubber slaughter was a great loss and he gradually withdrew from it. He was thinking of going back to the middle east when just a week

before he was planning to go, he came over a small advertisement in the newspapers calling for persons interested in poultry farming by the central hatchery, Chengannur. He and his wife attended the training together.

After attending the vocational training on poultry rearing and management, he made a small shed and started rearing 500 broiler birds. At first rearing of two lots of broilers was a great profit and he decided to rear more. He went ahead and reared two more lots of broilers of 500 numbers each. He however, found that the market was externally controlled and the market price fluctuates every day. It was at this time that he started a slaughtering unit. However, he did face with profits from broiler birds.

Then he contact KVK Pathanamthitta and got training on poutry production technologies especially egger nursery. Having gained knowledge and skill, he acquired required licenses for starting egger nurseries and got registered with the animal husbandry department and started rearing 1000 numbers of day old birds of improved variety. Then he started rearing Krishi Bro birds under the technical guidance of KVK and he could capture a niche in the market for coloured birds. He found that when conventional broiler market rate was externally controlled, the market for coloured broiler was not externally controlled. He could get Rs 130 to 190 per kg of coloured broiler whereas the farm gate price for the conventional broilers was only Rs.60-70/kg. Now, he owns farms where he rears 5000 birds of Grama Sree which he supplies to the farmers through government schemes. He also has conventional broiler in limited quantity which he rears and sells at 42 days of age through slaughtering unit. Not only does he have all these but also around 200 quails for eggs and meat and also a hundred numbers of BV 380 layer birds for egg purpose .

During 2018-19, he sold 2500 number of poultry birds to the department of animal husbandry under the school poultry project which earned him Rs.2.50 lakh. Apart from these, he has supplied 10000 birds for different government schemes in and outside the district that gave earning of Rs.10.00 lakh. He also has broiler and Krishi Bro birds which gave a profit of Rs.46991during the peak festival season alone.

He also has 200 number of quail birds and layer birds which he keeps for egg production and sells them @ Rs.6/egg from BV -380 and Rs.2 /egg from quails. His success is mainly because he takes care of the farm himself helped by his family. No external labour is used for day to day activities except 1 or 2 labour is required for transferring the birds to the market.



A view of poultry sheds established by Mr. K.T Varghese
(ii) Integrated Farming System

Smt. Yashoda Ashok Halli, ex-trainee of KVK Gadag, belonging to Shagoti village in Gadag block and district adopted Integrated Farming System in 3.30 acres of dry land in 2013 under the technical guidance of KVK. Her farm includes the components of improved varieties of grasses (Hybrid Napier, Rhodes grass, Guinea grass and Signal grass in 10 gunta area), Guava (50 nos.), Mango (40 nos.), Cashewnut (30 nos.), Brinjal, Green Chilli, Cucumber, Ridgeguard, drumstick (50 nos.), Watermelon, Papaya, Curry leaf (100 nos.) and four cows as IFS components. Apart from these, she established vermicomposting unit, jeevamruta unit, bio-digester unit with a financial support from Savayava Bhagya Yojanae (Organic Farming Project) of State Department of Agriculture. Further, she dug a borewell and installed drip irrigation system under the subsidy scheme of State Department of Horticulture.

She never used pesticides and chemical fertilizers in her farm. The bio-degradable agriculture waste produced in the farm is systematically recycled by her in the form of preparation of vermicompost, slurry from gobar gas unit and jeevamruta. She uses organic inputs as nutrients for the crops and uses neem oil for management of pest and diseases in vegetables. The application of these inputs has improved soil fertility status of her farm and improved the quality of agriculture produce.

She is marketing vegetables in different parts of the Gadag city as well as Wednesday Bazar being run by KVK at Hulkoti village with her own goods transport vehicle. This direct marketing of vegetables has increased the profit margin from vegetable cultivation. She got net income of Rs. 1.50 lakh from cultivation of ridge guard and green chilli and Rs.1.30 lakh from papaya and Watermelon during 2017-18. She collects 10 liters of milk everyday and supplies to the milk dairy in her village and earns Rs.30000 to Rs.35000 per year.

Her farm has become a source of planting material for farmers for improved grass varieties introduced by KVK. From 2013-14 to 2017-18, Smt. Yashoda sold grass slips to 316 farmers belonging to Gadag and neighbouring districts. While spreading the technology to other farmers, she earned Rs.1.60 lakh from sale of grass slips during last 3 years. Looking into the success of Smt. Yashoda, University of Agricultural Sciences, Dharwad has conferred her Best Farm Women during 2014-15 and she was also awarded Best District Level Farm Women by ATMA Cell of State Department of Agriculture, Gadag during the year 2017-18 and received cash prize of Rs.10000.

She is getting average income of Rs.5.50 lakh per year from 3.30 acres of land from crops and other enterprises. Further, she says that income from cashew and mango are yet to come. She duly acknowledged the involvement of her family members in all the agriculture operations of the farm, technical support by KVK and infrastructure support by Agriculture and Horticulture Departments for her success.



A view of different components of IFS of Smt. Yashoda
Ashok Halli

(iii) Leguminous and non leguminous fodder cafeteria

Shri Ningappa Shekappa Kenganur, has got 0.4 ha (1 acre) of land at Kabbenur village of Dharwad taluka. Earlier he was growing chickpea, chilly, onion in his one acre land. Overall his farm income was very low and he was putting lot of effort to increase farm returns. From these agriculture crops he used to get income of Rs. 45000/year. KVK Dharwad, scientists guided him with adoptive technologies suited to his farm conditions and advised to take up dairy and goat farming for sustainable income. Then, he attended training programmes on fodder production and storage, dairy and goat farming organized by KVK. Having gained knowledge and skill, he established dairy and goat farming under the technical guidance of KVK. Feed/fodder production and management as it contributes 60-70% of total cost to dairy or goat farming. He was suggested to establish leguminous and non leguminous fodder bank. He established leguminous (DHN-6, Guinea grass) and non leguminous fodder crops and tree bank (lucerne, drumstick, sesbania) in 0.4 ha of land. At present he is producing 260 tonnes of leguminous and non leguminous fodder and maintaining 5 HF cross cows and 30 goats. Shri Ningappa with his experience feels that a high yielding dairy cow require 2-4 kg of concentrate, 15-20 kg of green fodder and 5-7 kg of dry fodder depending on lactating and dry period condition. Goats require 150-400 g of concentrate, 2.5-5 kg of green fodder and 1-1.5 kg of dry fodder depending on pregnancy and dry period condition. Feeding leguminous and non leguminous fodder in the ratio of 1:3 had resulted in increase in milk yield of cows and body weight of goats. His fodder cafeteria has decrease of the cost of concentrate feed and fodder purchase.

Motivational interventions and mentoring by scientists of KVK enabled the farmer to carry out dairy and goat farming through establishment of leguminous and non leguminous fodder bank which has not only resulted in socio-economic security but also helped in attaining food and nutrition security of the community. Total cost for feed and fodder without fodder bank for maintaining 5 cow and 30 goats will be approximately Rs. 336900/year. Whereas establishing leguminous and non leguminous

fodder bank reduced the total cost of feed and fodder by (66.40%) which costs Rs.114000 for the same population. The adoption of this technology for dairy and goat farming enhanced his total income of Rs. 800000/- with B:C ratio of 3.66. Further, he has created employment for 2-4 labour for carrying out dairy farm activities throughout the year. At present he is serving as resource person for dissemination of technology in and around the villages of Kabbenur through FLD, field days, method demonstration, group discussion and trainings.



Horizontal spread through field day



Establishment of Fodder cafeteria



A view of fodder cafeteria



Established leguminous & non leguminous fodder cafeteria



Feeding of leguminous & non leguminous fodder

(iv) Ram Lamb Rearing

Shri Basavaraj Kammar, ex-trainee of KVK Haveri, belonging to the village Dundasi, Shiggaon (Tq) in Haveri district has adopted ram lamb rearing in 3 acre of lease land under the guidance of KVK Haveri. He constructed the pakka shed by spending around Rs. 65000. He purchased 50 ram lambs from local framer by spending 200000 during the year 2018-19. He feeding ram lambs with concentrate mixture 200 grams /day each, and is growing green fodder in the land which he has taken on lease. He is growing fodder trees like sesbania at the boarder of land. He has de-wormed his lambs after purchase. His rams are healthy and selling each ram at Rs. 10000/each of market price. He adopted Ram Lamb Rearing through All in All out approach batch by batch. He is getting a net profit of Rs.3.00 lakh per each batch. Three farmers of neighboring village have adopted the same model.



A view of Ram Lamb Rearing unit of Mr. Basavaraj Kammar

(v) Dairy in coffee based farming system

Shri P R Subash, Arvathoklu village, Virajpet taluk is practicing coffee based cropping system (15 acre) as a major activity and dairy (20 Jersey & H.F cows) as a subsidiary and complimentary farm activity. He came in contact with KVK in the year 2013-14 in one of the technology demonstrations related to animal nutrition and disease management. Then, he underwent trainings on IFS, dairy management, marketing of milk and value addition organized by KVK Kodagu.

He prepares Panchagavya enriched with Arka Microbial Consortium and applies to black pepper for plant health management. He established fodder cafeteria for sustaining the green fodder availability for animals round the year. He obtained FSSAI license for his brand - Karekadu by that he is marketing value added products from milk like pure cow butter and ghee with appropriate packing, labelling and distribution.

At present he is earning a net income of Rs. 1383900 from the major crops viz., Coffee (Rs.959400), Black pepper (Rs.275000), Arecanut (Rs. 109500), Coconut (Rs.40000)

and Rs. 454500 from dairy products viz., Fresh Milk (Rs.74500), Cow Ghee (Rs.280000) and Panchagavya (Rs.100000) per annum.

The kind (love and affection) of maintenance of animals, calves, shed in the farm by him brings lot of visitors to his farm for the new learners and adopters in recent years. Recently he started crossbred calves rearing as another income generating activity and taken care with lot of interest. He shares complete information and knowledge with his farm visitors in management of dairy unit, utility of waste, calves rearing, value addition. Thus, he is known as dairy farmer in coffee based farming system in the region.

He gave an employment opportunity for 2820 man days towards establishment, maintenance of entire estate (Coffee, Black pepper, Nursery and IFS unit) and two man days for dairy accounts to 1006100 per year (Rs. 300 per man day) and Rs.245000 / year, respectively.



A view of Dairy unit and brand - Karekadu



(vi) Integrated rabbit and poultry enterprise

Rabbit farming come up as an option for alleviating rural poverty among the farming community in recent times. Rabbits need small place for living and less food for surviving. Rabbit farming still in its infancy as far as India is concerned, several farmers are willing to take up rabbitary as an option for generating more income. One such farmer is Shri. Mohan of Raichur district established the rabbit unit in Karnataka - Telangana border to access breedable rabbit from a Hyderabad firm under the guidance of KVK Raichur. Shri. Mohan passed out as post graduate in Agricultural Economics from UAS, Raichur in 2017, with dreams of becoming an entrepreneur.

He designed his own rabbit cage for 10 rabbits with 10 ft length, 4 ft breadth and 1.5 ft height, a mechanism to place the young bunnies in a card board box and allowing mother rabbit to feed the bunnies in the box at a specified time of a day. This avoided the labour requirement totally for making the bunnies feed their mother milk and ensured mortality to less than 20%. Further, designed an innovative water channel system with nipples of appropriate shape and size from which rabbits suck the water whenever required. This increased the water consumption which directly influences the growth rate. Tested different feed bowls and standardized the right shaped earthen pots that reduced feed wastage. Integrated back yard poultry inside the rabbit house to optimize the space utilization, the choice of desi poultry breed – Aseel from nearby district Karnool was an instant success. These birds are in great demand not only for meat purpose but also for back yard poultry rearers. Trained the rural unemployed youth on scientific slaughtering and tied up with meat buyers from Hyderabad city. The assured market for meat is stable not only in terms of demand but also in terms of price.

Shri. Mohan has successfully established a rabbit farm with modern technologies coupled with his innovative ideas. He gets around 5 numbers of kits from each mother in every kidding after 28 to 30 days of crossing. These kits are given special care for 30 days and then are weaned from its mother who is then rebred. The rabbits bunnies segregated for meat purpose are reared for 90 days and when they become 2 kg in weight they are slaughtered and sold @ 370 Rs / Kg . In this way he is able to supply 70-80 kg rabbit meat per week from his own farm of 60 units capacity. His quality of meat and confidence gained from the buyers has enabled him to procure rabbits from other rearers and supplying to Hyderabad city. Weekly he is able to earn about Rs.10000 from rabbit farm. Additional revenue from selling the poultry birds is equally remunerative, from his present stock of 100 desi birds in each batch fetches him about Rs. 10000 additional revenue per week. Combination of rabbit and poultry has ensured weekly income of up to Rs. 20000.

Shri. Mohan with his rabbit farm is now not only a successful farmer but an entrepreneur as well. He tries to promote rabbit farming using all possible approaches. He is always ready to share his experiences with the people and encourages them to start up small units. He is also a master trainer in the field of rabbit rearing. His success as a rabbit farmer and an entrepreneur is attributed to his abilities to amalgamate his knowledge and hard work with willingness to meet challenges and work forward. He has planned to help small scale rabbit rearers in Raichur district for whom he is already supplying rabbit bunnies. He has planned to register his firm as Grabit Firm.



A view of Rabbit and Poultry enterprise

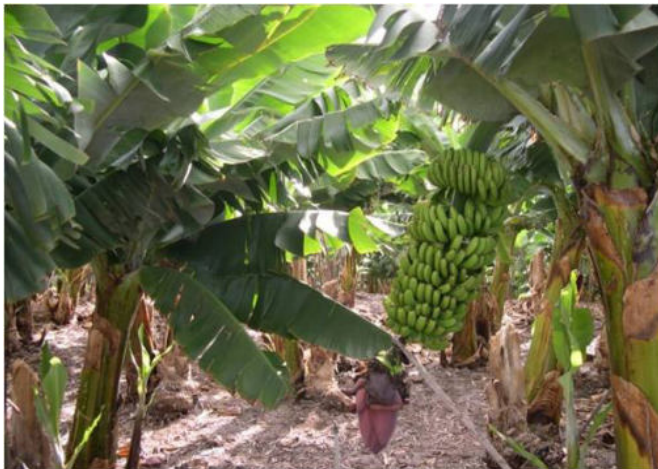
(vii) High density planting in banana

Most of the farmers opined that banana is a highly risky crop for the small land holders. A few institutes have released different technologies for increasing the productivity of banana. High density planting with paired row Zig Zag is one such technology developed by ICAR -National Research Centre - Banana, Thiruchirapalli. This technology helps the farmers to earn higher profits from limited land resources.

In this connection, Shri. Mahesh, Ex-trainee of KVK Hirehalli and progressive farmer from Makanahalli village of Tumakuru taluk adopted High Density Planting of Banana with paired row method under the technical guidance of KVK. In fact, he was a banana farmer specialized in the cultivation of G-9 variety and Yelakki. He planted the banana at a spacing of $1.5 \times 1.5 \times 2.0$ mt in a paired row with zig zag method of planting, unlike conventional planting of 2×2 mt. In this HDP method he could plant 5200 plants per hectare in place of 2500, as in conventional method. Though in conventional method, bunch weight of planting was 20.5 kg, his productivity was 578 qt/ha only. Whereas in this HDP method, though the bunch

weight was 17.2 kg (3 kg less than conventional), productivity was of 760 qt/ha (more than 180 kg than conventional), due to more number (almost double) of plants per hectare. This increased his income level to Rs. 3.82 lakhs / ha per annum with a B: C ratio 3.54 as against his earlier annual income from banana farming Rs. 1.47 lakh/ha.

Shri. Mahesh is further followed High Density Planting in banana with different varieties Viz., Yelakki bale, Puttabale etc., and earned more profit. High density planting helps the plants to utilize water and fertilizer more efficiently through increased root density and plants resist winds more effectively. Cost for staking was also considerably reduced, he said. Shri. Mahesh is instrumental in motivating other farmers of the village for adopting this technology.



HDP in Grand Naine variety



HDP in Yelakki bale variety

3.1.11 Recognition and Awards

- Sh. Ciby George, S/o Sh.K.V.Varghese, Kallingal House, Pattikad P.O., Thrissur, Kerala received Jagjivan Ram Abhinav Kisan Puraskar /Jagjivan Ram Innovative Farmer National Award-2017.
- Sh.Rajanarayanan T.V., S/o Sh. N.V.S.Manilyer, Venkita Nivas, Kaniyarcod P.O., Thiruvilwamala,

Thrissur, Kerala received Jagjivan Ram Abhinav Kisan Puraskar /Jagjivan Ram Innovative Farmer Zonal Award-2017.

- R. Raveendran, Reji Bhavan, KRA 172 Panachavila Lane, Uloor Med. Clg. PO Thiruvananthapuram, Kerala received Pandit Deendayal Upadhyay Antyodaya Krishi Zonal Puraskar-2017.

3.2 SPECIAL PROGRAMS

3.2.1 Cluster Frontline Demonstrations on Pulses under NFSM

The ICAR-ATARI, Bengaluru implemented the Cluster Frontline Demonstrations (CFLDs) on pulses under NFSM with financial support from Department of Agriculture, Co-operation & Farmers Welfare through ICAR, New Delhi with an aim to augment the production of pulses in the country. Under the project, 4375 demonstrations on blackgram, greengram, pigeonpea, chickpea and cowpea were conducted by KVKs of Karnataka and Kerala 1750 ha and of farmers fields and details are presented in Table 95. During kharif, 1950 demonstrations were

conducted by KVKs of Karnataka in 780 ha, out of which, 1150 demonstrations were on pigeonpea followed by greengram (525) and blackgram (275). During rabi, 1475 demonstrations were conducted by KVKs of Karnataka in 590 ha, out which highest demonstrations were on chickpea (1400) followed by blackgram (50) and greengram (25). In summer, 950 demonstrations were conducted in 380 ha by KVKs of Karnataka and Kerala, which includes 200 demonstrations on blackgram, 225 demonstrations on greengram and 25 demonstrations on cowpea by KVKs of Karnataka and 175 demonstrations on blackgram, 250 demonstrations on greengram and 75 demonstrations on cowpea by KVKs of Kerala.

Table 95: Cluster FLD organized by KVKs of Zone XI on pulses under NFSM

Season	State	Crop	CFLDs on pulses	
			Area (ha)	Demos (No.)
Kharif	Karnataka	Pigeonpea	460	1150
	Karnataka	Greengram	210	525
	Karnataka	Blackgram	110	275
Total (a)			780	1950
Rabi	Karnataka	Chickpea	560	1400
	Karnataka	Blackgram	20	50
	Karnataka	Greengram	10	25
Total (b)			590	1475
Summer	Karnataka	Blackgram	80	200
	Kerala	Blackgram	70	175
	Karnataka	Greengram	90	225
	Kerala	Greengram	100	250
	Karnataka	Cowpea	10	25
	Kerala	Cowpea	30	75
Total (c)			380	950
Grand total (a + b + c)			1750	4375



Greengram variety KKM-3
(KVK Shivamogga)



Green gram variety BGS 9
(KVK Kannur)



Pigeonpea variety TS-3R
(KVK Bagalkot)



Pigeonpea variety BRG-5
(KVK Chikkaballapur)



Blackgram variety DBGV-5
(KVK Bidar)



Chickpea JAKI-9218
(KVK Belagavi-II)



Cowpea variety DC 15
(KVK Davanagere)



Cowpea variety TPTC-29
(KVK Kottayam)

3.2.2 Cluster Frontline Demonstrations on Oilseeds under NMOOP

The ICAR-ATARI, Bengaluru implemented the Cluster Frontline Demonstrations (CFLDs) on oilseeds under NMOOP sanctioned by Department of Agriculture, Co-operation & Farmers Welfare through ICAR, New Delhi. During the period, 1975 demonstrations on groundnut, soybean, sunflower, niger, castor, linseed, mustard and sesame crops were conducted by KVKs of Karnataka and Kerala in 790 ha of farmers fields and details are presented in Table 96. During kharif, 600 demonstrations were conducted by KVKs of Karnataka in 240 ha, out of

which, more number of demonstrations were on soybean (250) followed by groundnut (175), sunflower (100), castor (50) and niger (25). During rabi, 875 demonstrations were conducted by KVKs of Karnataka in 350 ha covering 450 demonstrations on groundnut, 200 demonstrations on sunflower, 175 demonstrations on linseed and 50 demonstrations on mustard. During summer, 500 demonstrations were conducted in 200 ha, out of which 450 demonstrations on groundnut were conducted by KVKs of Karnataka and 50 demonstrations on sesame were conducted by KVKs of Kerala.

Table 96: Cluster FLD organized by KVKs of Zone XI on oilseeds under NMOOP

Season	State	Crop	CFLDs on oil seeds	
			Area (ha)	Demos (No.)
Kharif	Karnataka	Soybean	100	250
	Karnataka	Groundnut	70	175
	Karnataka	Sunflower	40	100
	Karnataka	Castor	20	50
	Karnataka	Niger	10	25
Total (a)			240	600
Rabi	Karnataka	Groundnut	180	450
	Karnataka	Sunflower	80	200
	Karnataka	Linseed	70	175
	Karnataka	Mustard	20	50
Total (b)			350	875
Summer	Karnataka	Groundnut	180	450
	Kerala	Sesame	20	50
Total (c)			200	500
Grand total (a + b + c)			790	1975



Sunflower hybrid Kaveri champ
(KVK Gadag)



Sunflower hybrid KBSH - 53
(KVK Haveri)



Groundnut variety Dh-245
(KVK Haveri)



Groundnut variety GPBD-4
(KVK Gadag)



Linseed variety PKVNL-260
(KVK Belagavi-II)



Linseed variety PKVNL-260
(KVK Vijayapura-II)



Sesame variety TMV 7
(KVK Palakkad)



Soyabean variety Dsb-21
(KVK Belagavi-II)

3.2.3 Seed Hubs

Timely availability of adequate quantity of quality seed is one of the most crucial factors to enhance productivity of pulses. In this direction the Department of Agriculture, Cooperation and Farmers' Welfare, Government of India has sanctioned a project on 'Creation of Seed Hubs for Increasing Indigenous Production of Pulses in India' under National food Security Mission (NFSM) for three years from 2016-17 to 2018-19 with ICAR-Indian Institute of Pulses Research (IIPR), Kanpur as Nodal Agency for its implementation at 150 Seed Hub centers across the country in State Agricultural Universities/Krishi Vigyan Kendras/ICAR Institutes. As a part of it, 8 KVKs viz., Bagalkot, Bidar, Belagavi-II, Dharwad, Kalaburagi-II, Mysuru, Vijayapura-I and Mandya established seed hubs and started functioning from Kharif 2016-17. During the reporting year, crop wise seed production carried out by KVKs through Seed Hubs under NFSM are presented in Table 97. Data shows that highest seed production was achieved in chickpea (1118.4 q) followed by greengram (691.35 q), pigeonpea (553.40 q), blackgram (301.65 q) and Cowpea (65.00 q). Thus, 2729.80 q of pulses seed were produced by the KVKs under seed hubs.

Table 97: Seed production of pulses through seed hubs under NFSM by KVKs in Zone XI

Crop	Varieties	Seed quantity (q)
Chickpea	BGD-103 and JAKI-9218	1118.40
Greengram	BGS-9 and DGGV-2	691.35
Pigeonpea	GRG- 811 and TS-3R	553.40
Blackgram	LBG- 791 and MDU-1	301.65
Cowpea	KM-5	65.00
Total		2729.80



A view of seed production of Blackgram variety LBG-791 (KVK, Mysuru)



Seed processing unit at KVK Kalaburagi-II

3.2.4 National Innovations in Climate Resilient Agriculture (NICRA)

The scheme on National Innovations in Climate Resilient Agriculture (NICRA) is being implemented through KVKs in the country to demonstrate the existing technologies on farmers' fields for enhancing climate resilience. In Zone-XI, technology demonstration component is being implemented in seven most vulnerable districts, namely Belagavi (drought/heat), Davanagere (drought/heat), Chikkaballapur (drought/heat), Tumkur (drought), Gadag (drought/heat) and Kalaburagi (drought/heat) in Karnataka and Alleppey (water inundation/drainage) in Kerala. The interventions are categorized under (1) Natural resources management, (2) Crop production, (3) Livestock and fisheries (4) Institutional interventions (5) Capacity building, and (6) Extension activities. The summary of activities under each of these modules carried out by KVKs during 2018-19 is presented in Table 98.



Table 98: Summary of activities carried out by the KVKs under NICRA

Name of KVK	NRM		Crop production		Livestock & Fisheries			Capacity Building		Extension Activities	
	Demos (No.)	Area (ha)	Demos (No.)	Area (ha)	Demos (No.)	Animals (No.)	Area (ha)	Training (No)	Farmers (No)	Programs (No)	Farmers (No)
Belagavi	230	192.6	667	190.0	210	1484	5.0	8	332	6	113
Davanagere	122	48.0	40	18.0	329	289	10.0	21	422	12	301
Gadag	14	10.4	173	70.0	40	65	30.1	30	861	50	1112
Kalaburagi	42	70.0	130	52.0	59	687	14.0	6	280	5	218
Chikkaballapur	208	100.9	509	115.3	50	651	15.5	4	127	4	119
Tumkur	125	14.2	178	77.10	30	0	8.0	3	85	6	206
Alleppey	120	41.0	85	19.5	71	60	365	11	217	9	167
Total	781	609.1	1782	541.9	789	3236	447.6	83	2324	92	2236

The module-wise technologies implemented in the NICRA cluster villages are discussed as under:

Module I: Natural Resources Management

Interventions related to moisture conservation technologies such as trench and bunding, desilting and repair of water storage structures, bore well/open well recharge and agroforestry were implemented under the module. Composting, soil test based nutrient application, in-situ moisture conservation like sowing across the

slope, deep tillage, water harvesting and recycling for supplemental irrigation and water saving technology were also promoted under the module. A total of 609.1 ha area has been treated with these NRM related interventions covering 1233 farmers' fields in order to build climate resilience through 781 demonstrations. The details are presented in Table 99.

Table 99: NRM activities undertaken in the NICRA villages

KVK	Name of intervention undertaken	Demo (No)	Area (ha)	Farmers covered/ benefitted (No)
Alleppey	Resource conservation technologies (Large scale composting of aquatic weeds using EM solution)	40	1	40
	Nutrient analysis of the soil and distribute soil health cards		100	200
	Subtotal	40	101	240
Belagavi	Desilting of Nalas	230	192.6	230
Chikkaballapura	Insitu moisture conservation practices	8	4	8
	Conservation tillage	52	14.5	52
	Resource conservation technologies	62	45.4	62
	Micro irrigation systems	60	24	60
	Green manuring	11	7	11
	Soil test based nutrient application	15	6	15
	Subtotal	208	100.9	208
Davanagere	Insitu moisture conservation practices	120	120	120
	Deepening and widening of check dam	2	10700 cum	77
	Subtotal	122	120	197
Gadag	Artificial ground water recharge	5	5.6	140
	Dryland horticulture orchard	9	4.8	33
	Subtotal	14	10.4	173

Kalaburagi	Insitu moisture conservation practices/ Ridge and furrow method dibbling in pigeon pea (TS-3R)	37	60	37
	Compartment Bunding in pigeon pea	5	10	5
	Subtotal	42	70	42
Tumkur	Trench cum bund in groundnut (Local)	4	1	15
	Bunding across farm	16	3.5	16
	Tank silt application in Fingermillet (ML-365)	18	3.5	18
	Levelling in Fingermillet (ML-365)	13	4	13
	Construction of new farm pond	2	2 Nos	14
	Renovation of farm ponds(Paddy)	1	1 Nos	11
	Renovation of check dam (Tomato)	2	2 Nos	12
	Water storage structure (Chrysanthemum)	1	1 Nos	7
	Dryland horticultural crop Tamarind PKM-1	52	1	12
	Dryland horticulture crop Jamun	15	0.2	15
	Desilting of community lakes (China aster)	1	1	10
		Subtotal	125	14.2
	Total	781	609.1	1233



Fig: Composting of aquatic weeds using EM solution at Alleppey



Fig: Bund formation in progress at Kalaburagi

Module II: Crop Production

Drought/high temperature tolerant varieties, improved varieties, drought tolerating measures, short duration varieties, crop diversification, location specific intercropping systems with high sustainable yield index, cultivation practices to overcome flooded situations, resource conservation and ecofriendly management

practices and water saving cultivation methods (SRI, aerobic, direct seeding) were the technologies demonstrated under the module. A total of 1782 farmers demonstrated these interventions in 541.9 ha area spread over in seven clusters of villages. The district wise and technology-wise details are presented in Table 100.



Table 100: Performance of climate resilient crop production technologies during 2018-19

KVK Name	Interventions	Farmers (No)	Area (ha)	Yield (Demo) Q/ha	Yield (Check) Q/ha	% Increase in yield	B:C Demo	B:C Check	
Belagavi	Short duration -Foftail millet -DHF1 1093	100	25	5.1	3.9	30.77	2.11	1.9	
	Black gram - DVG5 5	203	48	11.25	8.5	32.35	2.97	2.34	
	Pigeon pea TS3R	62	12	13.25	10.1	31.18	2.99	2.36	
	Drought tolerant Rabi Jowar M 35-1	150	59.2	15.25 (grain yield) 8.5(fodder)	11.2 (grain yield) 6(fodder)	32.6 (grain yield) 30 (fodder)	3.27	2.55	
	Chickpea JAKI -9218	89	18	9.21	7.24	27.2	2.96	2.5	
	Wheat DWR -2006	42	6.8	18.5	13.25	39.62	2.96	2.4	
	Integrated crop management - Maize	10	10	78.92	66.51	18.66	3.5	3	
	Mango- Kesar	11	11	Plantation date:2018-19 and Mango crop is under vegetative stage					
	Subtotal	667	190						
Chikkaballapura	HYV -Finger millet ML-365	210	41	4.21	3.53	19.26	0.48	0.4	
	Drought tolerant Redgram BRG-1	170	23.3	4.2	3.2	31.25	0.76	0.58	
	Intercropping Groundnut(K-6) + Redgram(BRG-1)	10	15	2.4	1.98	21.21	0.48	0.37	
	Horse gram -PHG 9	10	36	5.4	4.64	16.37	0.97	0.84	
	Soil Health Management in Mango	5	10.4	13.5	12.12	110 Kg/ha saving in nitrogen	2.5	1.5	
	Subtotal	405	125.7						
Davanagere	Intercropping Redgram(BRG-5) +Hybrid maize	30	14	48.79	39.1	24.55	1.9	1.56	
	ICM – Finger millet ML365	10	4	26.8	23.8	22.36	2.37	2.17	
	Subtotal	40	18						
Gadag	Maize+Redgram intercropping system	50	20	25.48	24.77	27.86	1.42	1.32	
	Foftail millet + Redgram intercropping system	10	4	7.31	8.2	8.2	1.84	1.23	
	Greengram + Redgram	20	8	8.34	5.73	31.29	1.38	1.14	
	Crop diversification - dryland horticulture with cashew and bund plantation of forestry seedlings	13	6	Crops are one year old and survival rate is 68%					
	Rabi Sorghum -SPV-2217	80	32	5.59	4.44	20.57	1.36	1.23	
	Subtotal	173	70						
Kalaburagi	Short duration Pigeon pea (TS-3R)	80	32	12.4	8.8	29.02	3.4	2.6	
	Short duration Chick pea JG-11	25	10	12.6	10.3	13.96	1.82	1.62	
	Drought tolerant Sorghum GS-23	25	10	16.9	13.5	20.11	6.08	5.2	
	Subtotal	130	52						
Tumkur	Drought tolerant Finger millet (ML-365)	75	26	46.3	32.4	30.02	2.5	1.8	
	Fingermillet (KMR 204)	21	10	13.3	10.5	21.05	1.58	1.31	
	Fingermillet (ML-322)	5	2	12.1	10.5	13.22	1.44	1.28	
	Grafted tomato for flood tolerance	2	0.1	359 kg/ha	321 kg/ha	10.58	3.2	2.8	
	French bean (Arka suvidha)	10	2	78.5	63.8	18.72	4.83	3.83	
	Foftail millet (DHF1 109-3)	4	1	1.4	1	28.57	2.36	2.12	
	Aerobic paddy (Paustic -9)	29	6	33.2	28.7	13.55	1.91	1.61	
	Intercropping of Fingermillet (ML-365) +Redgram (BRG-2)	32	30	15.2	14.6	39.42	1.86	1.75	
	Subtotal	178	77.1						



Alleppey	Resource conserving and eco friendly technologies in paddy cultivation	85	19.5	75.2	74.6	7.97	2.87	2.5
	Subtotal	85	19.5					
Total		1782	541.9					

During the year, the rainfall was severely deficient during kharif season in Chikkaballapur, Davanagere, Gadag, and Belagavi districts. Short duration varieties in cropping systems combined with moisture conservation practices helped to realize some yield in these districts. Whereas, in non NICRA villages farmers almost lost the crops. In Chikkaballapur, late sown horsegram as contingency crop gave some yield. Kalaburagi in Karnataka received better distribution of rainfall leading to better crop production. Alleppey in Kerala experienced severe flood during July and August months and paddy cultivation after the flood gave very high yield of 75.2 q/ha due to improved soil fertility.



Fig: Green gram + Red gram (2:1) intercropping system at Gadag gave some yield even during severe drought



Fig: Horsegram var. PHG-9 yields better as contingency crop at Chikkaballapur



Fig: Location specific intercropping systems (Pigeon pea + Pumpkin) at Kalaburagi

Module III: Livestock and Fisheries

Animal health camps, preventive vaccination, heat stress management in livestock through nutrition and improved shelter, breed upgradation through AI, improved fodder/feed storage methods, model dairy unit for stress and feed management and management of fish ponds /tanks during water scarcity and excess water etc. are the activities carried out under this module. The details are furnished in Table 101. During year, about 3236 livestock including poultry birds have been covered under various livestock interventions through 789 demonstration units to tackle the adverse climatic conditions in the NICRA villages. The slated poultry and livestock shelters established in Alleppey NICRA village have helped the villagers to keep their animals and poultry in the shelter during severe floods during July and August months. In order to enhance the fodder availability to livestock during lean period, silage production, enrichment of dry fodder and mineral mixture were demonstrated in the drought affected districts of Karnataka. In fisheries, common carp fish rearing was introduced in ten farm ponds during the year.

Table 101: Climate resilient technologies for sustainable production of livestock and fisheries.

Name of intervention undertaken	No. of KVKs	Demonstrations (No)	Animals/birds treated (No)
Preventive vaccination	2	130	1429
Introduction of improved breeds of deoni cows	1	5	5
Mineral Mixture Supplementation	3	315	315
Feed enrichment	1	101	101
Silage making	4	94	190
Azolla production	1	10	10
Improved shelters	1	5	50
Backyard poultry	3	128	681
Animal health camp	1	1	651
Total		789	3236
B. Fisheries			
Aquaculture production strategy	1	10	10,000 fingerlings
Total		10	10,000



Fig: Poultry cage useful during flood conditions at Alleppey



Fig: Climate resilient Deoni cows introduced from Deoni village of Maharashtra at Kalaburagi

Fodder production: 279 demonstrations were organized in 23 ha area of fodder production with drought tolerant multicut sorghum and other crops for fodder

production in the drought affected districts of Karnataka. The details are presented in Table 102.

Table 102: Climate resilient technologies for sustainable fodder production under NICRA villages

KVK	Interventions	Demonstrations (No)	Area (ha)	Total production (Quintal)
Chikkaballapura	Multicut sorghum var COFS -29	29	2.5	25
	Napier grass	10	1.4	1000
Davanagere	Drought tolerant multicut sorghum COFS-29	100	10	210
Gadag	Introduction of new fodder crops	10	0.1	5
Tumkur	Fodder Sorghum COFS-29	14	2	31.6
	Year round fodder production Melia dubia	62	6	Ongoing
	Moringa	54	1	Ongoing
Total		279	23	



Module IV: Institutional Interventions

The module consists of institutional mechanisms relating to seed bank, fodder bank, custom hiring centre, introduction of weather index based insurance and climate literacy through a village weather station. The NICRA

implementing centres have established five units of seed banks to meet the drought and flood related issues. In respect of custom hiring centres, 299 farmers of NICRA cluster villages have utilized various implements to cultivate 340.6 ha area for timely sowing and other cultural operations (Table 103).

Table 103 : Details of Institutional Interventions implemented under NICRA

KVK	Interventions	Demo(No)	Farmers(No)	Area(ha)
Belagavi	Seed bank	2	40	3
Chikkaballapura	Custom hiring centre for timely sowing	9	36	35
Davanagere	Custom hiring centre	2	40	39.9
	Climate literacy through a village level weather station	4	125	0
Gadag	Seed bank	3	seeds stored for next year	8
	Custom hiring centre	10	181	209.6
Kalaburagi	Custom hiring centre	6	42	58
Tumukuru	Agrometeorology advisory services	1	66	23
Total		37	530	376.5

Capacity building to farmers: During the year, NICRA implementing KVKs have conducted 83 trainings related to climate resilient agriculture benefiting

2324farmers including 485 women farmers. The details are provided in Table 104.

Table 104: Details of capacity building programmes organized under NICRA

KVK	Trainings (No.)	Participants (No)		
		Male	Female	Total
Belagavi	8	325	27	352
Chikkaballapura	4	110	44	152
Davanagere	21	263	122	385
Gadag	30	658	113	771
Kalaburagi	6	258	104	362
Tumukuru	3	73	12	85
Allepy	11	154	63	217
Total	83	1841	485	2324



Fig: Training to NICRA farmers on IPM in Pigeon pea

Extension Activities: During the year, 92 extension activities have been carried out to create awareness among the community about the climate related impacts on the agriculture and related aspects through 92 various activities. A total of 2236 farmers have benefitted through their participation in these programmes including 515 women farmers (Table 102.). About 234 farmers including 75 women farmers were taken on exposure visits to various places/intuitions by the NICRA KVKs during the year.

Table 105: Details of extension activities organized under NICRA

Thematic area	KVKs (No.)	Activities (No.)	Participants (No.)		
			Male	Female	Total
Exposure visits	3	9	159	75	234
Diagnostic visit	1	5	27	23	50
Method demonstrations	4	8	137	50	187
Agro advisory services	1	14	292	48	340
Field Day	5	11	384	96	480
Group discussion	2	14	163	27	190
VCRMC meeting	3	11	274	27	301
Awareness	2	6	144	26	170
Trainings	1	11	100	117	217
Campaigns	1	3	41	26	67
Total		92	1721	515	2236



Fig: Exposure visit of NICRA farmers to UAS Raichur Krishimela

3.2.5 Skill Development Programmes

During 2018-19, 70 skill development training programs were sanctioned to be conducted by 35 centres in Zone XI. Altogether 62 programs were conducted benefiting 1212 participants. In Karnataka, 871 participants were benefited under 44 programs conducted by 18 KVKs, one ICAR institute and 5 SAUs. In Kerala, 8 KVKs and one ICAR Institute organized 18 programs benefitting 341 participants (Table 106).



Table 106 : Summary of skill development training programs conducted in the Zone

States and Implementing Centres	Participating Centres (No.)	Programs (No.)	Participants (No.)
Karnataka			
KVKs	18	33	651
ICAR Institutes	1	2	40
SAUs	5	9	180
Sub Total	24	44	871
Kerala			
KVKs	8	16	301
ICAR Institutes	1	2	40
Sub Total	9	18	341
Total	33	62	1212

Job-role wise programs conducted in Karnataka indicates that, Dairy Farm Entrepreneur and Friends of Coconut Tree were the major Job Roles on which the skill development was conducted with 8 and 7 program respectively. Organic Grower with 5 programs was followed by Nursery Worker and Mushroom Grower with four programs each. Skill training was conducted on a total of 14 Job Roles in the State (Table 107).

Table 107: Job-role wise number of participants in Karnataka

Sl No.	Job role	Programs (No.)	Participants (No.)
1	Beekeeper	3	60
2	Coconut Grower	1	20
3	Dairy Farmer - Entrepreneur	8	160
4	Friends of Coconut Tree	7	141
5	Mango Grower	2	39
6	Micro Irrigation Technician	1	20
7	Mushroom Grower	4	78
8	Nursery Worker	4	74
9	Organic Grower	5	100
10	Quality Seed Grower	3	60
11	Sericulturist	1	20
12	Small Poultry Farmer	2	40
13	Tractor operator	1	20
14	Vermicompost Producer	2	39
	Grand Total	44	871

Kerala: Job Roles on which skill development programs were conducted distributed widely as indicated by maximum of 2 programs each under Friends of Coconut Tree, Micro Irrigation Technician, Mushroom Grower, Nursery Worker and Vermicompost Producer. One program each was conducted on other 8 Job Roles.

Table108: Job-role wise number of participants in Kerala

Sl No	Job role	Programs (No.)	Participants (No.)
1	Agricultural Extension Service Provider	1	20
2	Aquaculture worker	1	20
3	Artificial Insemination Technician	1	20
4	Assistant Gardener	1	16
5	Beekeeper	1	20
6	Coconut Grower	1	18
7	Friends of Coconut Tree	2	39
8	Micro Irrigation Technician	2	39
9	Mushroom Grower	2	31
10	Nursery Worker	2	38
11	Quality Seed Grower	1	20
12	Small Poultry Farmer	1	20
13	Vermicompost Producer	2	40
	Grand Total	18	341

3.2.6 Attracting and Retaining Youth in Agriculture

Realizing the importance of rural youth in agricultural development, ICAR has initiated a programme on “Attracting and Retaining Youth in Agriculture (ARYA)” during 2015-16. The ARYA project aims at attracting and empowering youth in rural areas to take up agriculture and allied sector enterprises for sustainable income and employment. It enables youth to establish network groups to take up resource and capital-intensive activities like processing, value addition and marketing of value-added products. The main agenda of the project was to provide complete knowledge and skill on processing, value addition and marketing of agriculture products through capacity building programmes involving research and development organizations.

In ATARI, Zone XI, Bengaluru Rural and Kannur KVKs implemented the ARYA program. Under this, 17 training programs were organized to train the rural youth on income generating activities. A total of 608 rural youth were trained on bee keeping, coconut climbing, vemi-compost techniques, nursery techniques, and processing



and value addition in nutri-millet and jackfruit. Critical inputs were provided to rural youth to support the enterprises. Market linkages were established for effective and timely marketing of the produce from the enterprise units.

3.2.7 Capacity Building of Farmers on Land Resource Inventories under Sujala-III

Karnataka has 19 million hectare of cultivable land of which 15 million hectare depend upon rainfall for cultivation. Understanding the importance of dry lands watershed development department, GOK with joint collaboration with ICAR-National Bureau of Soil Survey and Land Use Planning (NBSSLUP) developed Land Resource Inventories (LRI) under the World Bank funded

Watershed Development Project-II (Sujala-3 Project). But the effective utility of LRI maps and its contents depend on the extent to which farmer's capacity is built on understanding the contents of the maps and approaches to use these contents. Realizing the need for farmers' capacity development, the Watershed Development Department (WDD), Government of Karnataka (GOK) proposed to ICAR ATARI Bengaluru to organize capacity development programmes to farmers at the micro watershed level through its KVK network.

Bidar, Kalaburagi, Raichur, Gadag, Vijayapura, Koppal, Yadgir, Davanagere, Chamarajanagara and Tumakur districts were sanctioned with a total of 225 training programmes with the budget as indicated in the Table 106 for the period April 2018 to June 2019.

Table 109: Budget sanctioned under Sujala-3 for the year 2018-19

Sl.No.	KVK	Trainings (No.)	Budget Sanctioned (Rs)	Budget received (Rs)
1	Bidar	30	600000	387075
2	Kalburgi-1	30	600000	392753
3	Raichur	30	600000	398384
4	Vijayapura-1	28	560000	266593
5	Gadag	50	1000000	600000
6	Davanagere	60	1200000	699900
7	Tumkur-II	30	600000	281728
8	Chamarajanagara	30	600000	371000
9	Koppal	20	400000	200000
10	Yadgir	25	500000	250000
	Total	333	6660000	3847433
Budget breakup for ICAR-ATARI for monitoring, coordination and follow up (Rs. lakh)				
	Travelling cost and POL, Including vehicle hire		3.35	
	SRF		5.20	
	Stationary and printing charges		1.00	
	Institutional Charges		0.96	
	Total for ICAR ATARI Bengaluru		10.51	
	Total for KVKs and ATARI Bengaluru		77.11	
	Service charge		6.34	
			83.45	

The KVKs organized the training and capacity development using their own expertise and also by making use of the resource persons available in the watershed

development department. The progress achieved as on 31st March 2019 is indicated in Table 110.

Table 110: Progress achieved under Sujala-3 during April 2018-March 2019

Sl. No.	District	Micro-watershed (No.)	Villages (No.)	Trainings (No.)	Participants (No.)
1	Bidar	10	10	10	300
2	Chamarajanagara	11	10	10	300
3	Davanagere	29	35	34	551
4	Gadag	9	6	11	336
5	Gulberga	10	10	10	450
6	Koppal	2	3	3	145
7	Raichur	2	5	5	300
8	Tumakuru	14	11	11	331
9	Vijaypura	15	10	10	480
10	Yadgir	10	5	5	360
Total		112	105	109	3553

The ten KVKs of Karnataka have conducted a total of 109 LRI training programs at village level as on 31st March 2019. Total 3553 farmers were trained under these training programmes on LRI components like, soil maps, soil types, nutrient status, soil classification, crop suitability and soil and water conservation measures through pictorial explanation of the LRI components with the help of charts. LRI cards which gives the idea of sufficiency, deficiency of the nutrients, soil type and crop suitability of the individual farmers' field, were distributed to participating farmers.



KVK Scientists Explaining about the training program



Inauguration of the training program by Dignitaries of World Bank

3.2.8 Awareness Programmes on PPV&FR Act

The Ministry of Agriculture and Farmers Welfare encourages registration of farmer's varieties of crops under Protection of Plant varieties and Farmers Right Act 2001 (PPV&FRA). The Authority encourages protection for new plant varieties, essentially derived varieties, extant varieties and farmers' varieties. This act has recognized farmers as innovators, conservers, breeders, preservers of plants and plants varieties in addition to cultivators. The major agenda of these programmes includes exhibition of farmers' varieties in various crops, seminars from eminent scientists, group discussions and registration of farmers' varieties under PPV and FR Act.



During 2018-19, KVK Alappuzha and KVK Kodagu organized awareness programmes. A total of 352 farmers have participated in the programmes. The officers from State Government, Agriculture Universities, Panchayat members and ICAR Scientists have also participated in the programmes. The major activities of these programmes included exhibition of crop and medicinal plant varieties, seminars from eminent scientists on Protection of Plant Varieties and Farmers' Rights Act, turmeric varieties suitable for cultivation and conservation of wild edible fruits.

3.2.9 Swachh Bharat Mission

The ICAR-ATARI, Bengaluru has been implementing Swachh Bharat Mission- a nationwide programme for promoting cleanliness of the country since 02 October, 2014. During the year, the Institute and KVKs of the Zone consisting of states viz., Karnataka, Kerala, and Lakshadweep carried out towards Swachhata Abhiyan wherein covered more than 6000 activities. Details are given below.

- (a) **Swachhata Abhiyan:** Carried out different activities under the main themes of (i) Cleaning drive, (ii) Digitization of office records, e-office and procurement, (iii) Awareness about Swachhata, (iv) Waste management, (v) Natural Resource Management and (vi) Sanitation, health and hygiene. Specific activities includes – cleaning of office premises, individual rooms, terrace/roof top; dusting of windows and doors; sprucing up work stations, almirah and wardrobes; cleaning of notice boards, car sheds and store rooms; cleaning of furniture and equipments; collection of biodegradable waste for recycling; e-tenders; housekeeping for corridors, floor and toilets, cleaning drive in public places and in cluster villages of KVKs; weed removal campaign especially in public places and office premises; awareness programmes on swachhata for school children, college students/youth, farmers, tribal and staff of different organizations; training and demonstrations on composting/recycling of farm waste as well as eco friendly technologies and organic farming; safe usage of pesticides; animal

health care including shed cleaning drive; sanitation and nutrition programmes for better health.

- (b) **Swachhata Hi Seva Campaign:** It was observed from 15 September to 02 October, 2018 as a part of the 150th Birth year celebrations of Mahatma Gandhi through the creation of personal motivation among the officers and staff of the ATARI and its KVKs as per the guidelines provided by the ICAR. Different activities carried out were swachhata pledge, awareness programmes on toilet hygiene and new constructions, cleaning of streets, drains and back alleys, waste collection drives in households and common/shared places, awareness campaigns on sanitation, health and hygiene, seminars on swachhata related activities, display of banners on swachhata in public places, segregation of non-biodegradable and degradable waste and training programmes on compost making through waste.
- (c) **Swachhata Pakhwada:** It was undertaken by the Institute across the KVKs during 16-31 December, 2018 as per the ICAR guidelines. Different activities carried out were display of banner on swachhata at prominent places, taking swachhata pledge, planting of trees, cleaning of office infrastructure, sanitation and spot solutions on safe disposal of all kinds of waste, cleanliness drive within campuses and surroundings, cleanliness and sanitation drive in the cluster villages of KVKs involving village community, awareness on generation of wealth from waste, composting of kitchen and home waste materials, promotion of clean and green technologies, awareness on recycling of waste water, workshops on swachhata, exhibitions on swachhata activities, demonstrations on swachhata technologies, training on swachhata technologies, competitions on swachhata, fostering healthy competition, involvement of VIP/ VVIPs in the Swachhata activities, involvement of print and electronic media for adequate publicity on Swachhata Pakhwada, experience sharing on swachhata initiatives by farmers and civil society officials, felicitating farmers/ civil society officials for exemplary initiatives on swachhata and award ceremony.



Administering Swachhta Pledge by Dr.M.J.Chandre Gowda, Director of ICAR-ATARI, Bengaluru



Planting of tree sapling by Dr.M.J.Chandre Gowda, Director, ICAR-ATARI, Bengaluru



Clininess drive in the campus (KVK Raichur)



Door to door meeting to bring behavior changes towards swachhata (KVK Malappuram)



Demonstration of compost preparation using farm waste (KVK Ramanagara)



Construction of toilet pit (KVK Belagavi –II)



Making wall painting in the theme of swachhata at Govt. Higher primary school at ARS Colony, V.C.Farm, Mandya (KVK Mandya)



Cleanliness drive in school (KVK Shivamogga)



Campaign on cleaning of sewage water and water lines (KVK Mysuru)



Awareness rally with farmers in the villages on swachhta (KVK Kozhikode)

3.2.10 Mera Gaon – Mera Gaurav (My Village – My Pride)

The ICAR-ATARI, Bengaluru is coordinating the activities under Mera Gaon - Mera Gaurav (MG-MG) in Zone XI. Ten ICAR Institutes in the zone viz., ICAR-IIHR, Bengaluru; ICAR-NIANP, Bengaluru; ICAR-NBAIR, Bengaluru; ICAR-NIVEDI, Bengaluru; ICAR-DCR, Puttur in Karnataka, ICAR-CPCRI, Kasaragod; ICARCTCRI, Trivandrum; ICAR-IISR, Calicut; ICAR-CMFRI, Cochin and ICAR-CIFT, Cochin in Kerala

implemented the MG-MG programme through formation of 126 multidisciplinary teams of scientists. Scientists teams extended advisory services as well as disseminated latest technologies in agriculture and allied sectors through organization of 3990 activities like mobile based advisories, extension literature, team visit to villages, interface meeting/goshthies, awareness programmes, method demonstrations, training programmes, linkages with other agencies, introduction of new technologies, introduction of new varieties, introduction of new crops with the participation of 38758 farmers in 565 adopted villages.



Intervention on cage farming of *Etroplussuratensis* at Mujukunnu, Kozhikode District under MGMG (ICAR-CMFRI, Kochi)



Group meeting on Soil Testing Health Cards at Hesaragahtta village under MGMG (ICAR-IIHR, Bengaluru)



Providing seeds of new fodder varieties to farmers belonging to Doddabommanahalli village under MGMG (ICAR-NIANP, Bengaluru)



Providing planting materials of new varieties of tuber crops to farmers of Njandoorkonam village under MGMG (ICAR-CTCRI, Thiruvananthapuram)



Collecting blood samples and anthrax vaccination camp at Kodihalli village under MGMG (ICAR-NIVEDI, Bengaluru)

-:O:-

3.2.11 Establishment of District Agricultural Meteorological Units (DAMU) under KVKs

Indian Meteorological Department (IMD) is establishing weather observing system and development of Gramin Krishi Mausam Sewa in the country. In pursuance of this, IMD has sanctioned 130 DAMUs

which are multidisciplinary units in selected KVKs for preparation and dissemination of district and sub-district agro-met advisories under ATARIs. The list of KVKs 16 DAMUs have been sanctioned during 2018-19 to ATARI, Bengaluru, are given in Table 111.

Table 111: List of KVK selected to establish DAMUs under Zone-XI

Sl.No.	State	KVKs No.	District	KVK/ Location of DAMU
1.	Karnataka	12	Haveri	KVK Haveri, Hanumanamatti
2.			Mandya	KVK, Mandya, V.C.Farm
3.			Bellary	KVK Ballari, Hagari
4.			Hassan	KVK Hassan, Kandali
5.			Kodagu	KVK Kodagu, Gonikoppal
6.			Bagalkot	KVK Bagalkot
7.			Koppal	KVK Koppal, Gangawathi
8.			Yadgir	KVK Yadgir, Kawadimatti
9.			Tumkur	KVK ZARS, Konehally
10.			Ramanagara	KVK Ramanagara, Chandurayanghalli
11.			Chamrajnagar	KVK Chamarajanagar, Haradanahally
12.			Kolar	KVK Kolar, Tamaka Farm
13.	Kerala	3	Malappuram	KVK Malappuram
14.			Palghat	KVK Palghat, Pattambi
15.			Wayanad	KVK Wayanad, Ambalavayal
16.	Lakshadweep	1	Kiltan	KVK, Lakshadweep, Kiltan island

The IMD has sanctioned one SMS (Agromet) and one Agro-met Observator to each DAMU implementing KVKs on contractual basis. The KVKs are in the process of recruiting the sanctioned project staff.

Orientation training on 'preparation and dissemination of Agromet Advisories at Block level under Gramin Krishi Mausam Seva (GKMS) scheme was organised on 28 September, 2018 for the Programme Coordinators of 15 KVKs of Zone XI, 12 in Karnataka and 3 in Kerala.



3.2.12 Farm Mechanization:

Ministry of Agriculture and Farmers Welfare, Department of Agriculture, Cooperation and Farmers Welfare has provided Central Assistance under Submission on Agricultural Mechanization (SMAM) to ICAR KVKs at the rate of Rs 40 lakh to each KVK during 2018-19.

Making use of the fund, KVKs have acquired the need base implements/machines for promoting mechanization in the KVK farms. The following are the list of Implements/machines procured by the six ICAR KVKs under ATARI, Bengaluru (Table 112).

Table 112 : List of farm machineries procured under Mission on Agricultural Mechanization

KVK Calicut	KVK Kasaragod	KVK Ernakulam	KVK Alleppey	KVK Tumkur-II	KVK Kodagu
Straw chopper / Shredder	Zero till seed cum fertilizer drill	50 HP Tractor	Tractor	Solar Pump sets	Big tractor (55 Hp)
Shrub master cutter cum spreader	Brush Cutter	28 HP tractor	Small tractor with small trolley and cultivator	Flour Mill	Mini tractor with trailer
Shrub master	Paddy drum Seeder	Rice Trans planter	Disc plough	Multi crop thresher	Solar water pumpset
Power weeder	Rice Trans planter	Straw chopper/ Shredder	Tractor drawn zero till seed cum fertilizer drill	Mini tractor (Sonalika)	Power weeder
Multipurpose pulveriser with 10 HP motor	Tractor 50 HP	Reversible MB plough	Cultivator	Big tractor (Ferguson)	Weed cutter/ Brush cutter
Tractor – New Holland 3630 TX plus – 50-55 hp	Cultivator	Power tiller	Rotovator	Big tractor (Swaraj)	Power Sprayer
Rotavator	Reversible M.B Plough	Tractor operated post hole digger	Bund former	Power tree trimmer	Knapsack sprayer
Disc plough	Rotavator	Power weeder	Tractor drawn leveler	Shrub master	Rotovator
Cultivator	Cono weeder (Powered rotary)	Disc plough	Mulcher	Cultivator	Raised Bed maker cum mulching machine
Bund former	Power tiller	Rotovator	Tractor operated post hole digger	Bund former	Land Leveller
Plastic mulch laying machine (Mulcher)	Small tractor with trolley and cultivator	Cultivator	Reversible Mould Board Plough	Power weeder (Brush cutter)	Fodder/ Chaff cutter
Mini tractor trailer	Bund former	Single bund former	Power tiller -12HP	Rotovator	Mushroom Drier
Power tiller – 12 hp	Mulcher	Coconut climbing machines	Straw chopper/shredder	Dhal Mill	Field Ladder
Small Tractor with small trolley and cultivator	Disc Plough		Power weeder		
Mini oil mill	Tractor drawn leveler		Rice trans planter (walk behind type)		
Kamco power tiller	Power weeder				
Conoweeder / wet-land weeder					
Post hole digger					
Solar water pump					
Mini pulveriser					
Sprayer					
Pepper thresher					
Coconut de-husker					
Grinder					



3.2.13 MICRO-IRRIGATION Units

Water being the most critical input for agriculture, its judicious use is important to ensure sustainable agricultural development and food security. The Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW), Government of India has launched Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) on 1st July, 2015 with the objective to achieve convergence of investments in irrigation sector at field level. Micro irrigation (MI) is an integral component of PMKSY to maximize water use efficiency at field level and ensuring 'Per Drop-More Crop' (PDMC). During 2018-19, DAC & FW has sanctioned a project to Division of Agricultural Extension, ICAR, New Delhi for establishment of demonstration units on Micro Irrigation Systems (Drip/Sprinkler) in 190 KVKs under PMKSY-PDMC with the following two main objectives:

- (i) Establish demonstration units on micro irrigation systems suitable to local agro-climatic conditions taking into consideration the concept of water use efficiency, and
- (ii) Showcase the benefits of established demonstrations on micro irrigation systems to farmers for encouraging them to adopt these technologies for enhancing water use efficiency, increase productivity of crops and income.

In zone XI, eight KVKs viz., Raichur, Yadgir and Wayanad belonging to aspirational districts and Tumakuru-II, Kodagu, Kasaragod, Alappuzha and Kozhikode belonging to ICAR Institutes have established demonstration units on Micro Irrigation Systems. As per the guidelines provided by the ICAR, instructional farms have established drip, sprinkler, micro-sprinkler and mist irrigations. KVKs conducted 12 programmes to train and motivate 350 farmers to adopt these technologies.

3.2.14 Krishi Kalyan Abhiyan

The Ministry of Agriculture & Farmers welfare launched Krishi Kalyan Abhiyan (KKA) on 01 June, 2018 in aspirational districts across the country to provide assistance and advice for farmers on improving their farming techniques and raise their incomes. KKA Phase

2 was launched on 2 October, 2018 to give a boost to agriculture and allied activities in aspirational districts. The modus operandi of KKA is to undertake 25 villages with more than 1000 population, each in Aspirational Districts identified in consultation with Ministry of Rural Development as per directions of NITI Ayog. In the districts where the number of villages (with more than 1000 population) is less than 25, all villages will be covered. Action Plan of KKA comprises of the various activities which promote best practices and add to the agriculture income of the farmers. Respective Krishi Vigyan Kendras and in-charge Officers from the Ministry were given the responsibility for the coordination, implementation and field level monitoring.

As a part of the Scheme, three KVKs of Zone XI viz., Raichur and Yadgir in Karnataka and Wayanad in Kerala implemented the KKA in 25 selected villages of their respective districts in collaboration with Department of Agriculture, Government of Karnataka. Activities undertaken by these KVKs are presented hereunder.

- (a) Training programmes :** Details on training programmes conducted under KKA in aspirational districts of Zone XI are presented in Table 113. A total of 331 training programmes were conducted by three KVKs and trained 17780 farmers. Out of which, 177 training programmes were conducted during first phase of KKA with the participation of 9911 farmers and 154 training programmes were conducted during second phase of KKA with the participation of 7869 farmers. Bee keeping, mushroom cultivation, kitchen gardening, pepper cultivation, banana cultivation, passion fruit cultivation, coconut cultivation, paddy cultivation, floriculture, goat rearing, cattle rearing, vermi composting and value addition were the areas of training.



Table 113: Training programmes conducted under KKA by KVKs in aspirational districts of Zone XI

KVK	KKA Phase I		KKA Phase II		Total	
	Trainings conducted (No.)	Farmers trained (No.)	Trainings conducted (No.)	Farmers trained (No.)	Trainings conducted (No.)	Farmers trained (No.)
Raichur	79	3950	105	5250	184	9200
Yadgir	72	4494	25	1419	97	5913
Wayanad	26	1467	24	1200	50	2667
Total	177	9911	154	7869	331	17780



(b) **NADEP compost units:** Raichur and Yadgir KVKs established a total of 600 NADEP compost units under Krishi Kalian Abhiyan in 30 villages (15

villages from each district) benefiting 600 farmers (20 farmers from each village)



(c) **Extension services:** Extension services provided under KKA by KVKs in their respective aspirational district are presented in Table 114. From the Table it shows that 5.32 lakh extension services were provided by KVKs in three aspirational districts of which 2.54 lakh in the first phase and 2.78 lakh in the second phase Services rendered on providing soil health cards, mini-kits of pulses and oilseeds,

seedlings of horticulture/agro forestry/bamboo, FMD vaccination for bovine, PPR vaccination for sheep and goat, artificial insemination and agriculture implements are given in Table 114. KVKs also undertook different extension activities on technology awareness and demonstrations.

Table 114: Extension services provided under KKA by KVKs in aspirational districts of Zone XI

Extension activities (Numbers)	KKA Phase I (No.)			KKA Phase II (No.)			Total (No.)		
	Raichur	Yadgir	Wayanad	Raichur	Yadgir	Wayanad	Raichur	Yadgir	Wayanad
Soil Health Cards	12055	4873	22150	3792	5337	16913	15847	10210	39063
Mini-kits of pulses and oilseeds	5000	5040	0	1800	3074	0	6800	8114	0
Seedlings of Horticulture/Agro Forestry/Bamboo	6922	26900	11716	0	0	0	6922	26900	11716
FMD vaccination for Bovine	11668	14079	47307	16754	31879	42289	28422	45958	89596
PPR vaccination for Sheep and Goat	26383	28280	27000	60446	57129	26050	86829	85409	53050
Artificial insemination	1875	2157	0	1680	9602	598	3555	11759	598
Agriculture implements	190	0	206	215	500	164	405	500	370
Total	64093	81329	108379	84687	107521	86014	148780	188850	194393
Grand total	253801			278222			532023		



3.3 FARMER FIRST PROGRAMME

The Farmer FIRST (Farm, Innovations, Resources, Science and Technology) initiative was launched by ICAR to move beyond production and productivity; to privilege the smallholder agriculture; and complex, diverse and risk prone realities of majority of the farmers through enhancing farmers-scientists interface. Farmers play the centric role for research problem identification, prioritization, conduct of experiments and its management in the actual field conditions. It emphasizes on resource

management, climate resilient agriculture, production management including storage, marketing, supply chains, value chains, innovation systems and information systems.

The Farmer FIRST Project was sanctioned by the Division of Agricultural Extension, ICAR, New Delhi and it was implemented through ICAR-ATARI, Bengaluru by 3 Institutes viz. ICAR-IIHR, Bengaluru, ICAR-NIANP, Bengaluru and ICAR-CPCRI, Kasaragod (Kayankulam Regional Station) (Table 115).

Table 115 : Farmer FIRST budget, villages and households covered under the programme

Name of Institute	Villages/wards (No.)	Households (No.)	Budget (Rs. lakh)
ICAR-CPCRI, Kasargod	19	1000	22.25
ICAR-IIHR, Bengaluru	6	800	23.75
ICAR-NIANP, Bengaluru	3	500	24.5
Total	28	2300	70.5



During the year, the 3 centres made several interventions at the field level in crop, horticulture, livestock, NRM, enterprise and Integrated Farming System (IFS) modules.

In Alleppey district, ICAR-CPCRI is working in 19 Panchayat wards. The major interventions in the crop based module are 218 model demonstration plots in farmers garden for 16112 palms in 125 ha. Kayamkulam-1 and Thilak were assessed as the suitable varieties of sesamum in terms of yield (300-500 kg/ha), oil recovery (38-48 %) and resilience to high temperature and drought. These have spread over 80.97 ha. Introduced variety of finger millet (Paiyur 2) and Paiyur variety of horsegram in a total area of 15 ha with an average yield of 2.5 t per ha as intercrop in coconut garden. In the horticulture based module, community based planting material, production of HYV of tuber crops, turmeric and ginger enabled cultivation of these in 19 wards of the panchayath. A paradigm shift in vegetable cultivation with 2 vegetables per ward (KAU varieties) in a total area of 20 hectares was adopted. In the NRM module soil based nutrient application (71 soil health cards issued each for 5 ha grid) and convergence project of rejuvenation and reclamation of homestead and common ponds for water conservation and integrating fisheries was initiated for 30 ponds. In the value addition and entrepreneurship module, coconut processing and value addition units were established. Two each of virgin coconut oil, coconut oil and coconut based food product units add value to 5000 coconuts per month. Kalpakam Kera Probio production unit, started during September 2018, produced 4.3 tons and reached out to 1500 farmers in three districts. In the livestock module cow mat (104 nos) as a good management practice was adopted in 35 units with improvement in animal health and milk yield. Five egg incubators for production of 500 chicks/ducklings per cycle established successfully and 2000 chicks/ducklings were distributed. Sixty four poultry farmers were clustered as pre action for FPO formation with 3000 birds, targeting production of 1000 eggs per day in the FFP area. The Integrated Farming Systems (IFS) module mainly concentrated on scientific integration of already existing small and marginal holdings and customizing homestead wise technology and farm component integration in 100 gardens. A total of 23 training programme for 993 participants, 25 focus group discussions/ group meetings in which 782 farmers/stakeholders participated, 89 field visits and 11 method demonstrations were conducted.

IIHR Bengaluru project is implemented in six villages at Kanakapura taluk, Ramanagara district. Improved and disease resistant varieties and hybrids along with IPM and INM in ragi and redgram had given higher yield and income to the farmers. Nonlodging, semi dwarf (GPU-67),

and high grain and straw (KMR-301) varieties were taken for demonstrations. Precision farming in vegetable and flower crops which consists of improved varieties/hybrids resistant to pests and diseases, raised bed cultivation, drip irrigation and fertigation with water soluble fertilizers, use of 30- or 40-micron mulching sheet, integrated pest management, integrated disease management integrating with the botanical and bio-pesticides was demonstrated. Climate resilient and safe (crop, soil and consumers) technological products were introduced for soil and foliar application in vegetable and flower crops. There was increase in yield by 80 to 150% resulting in higher net-income of farmers. Livestock technological interventions such as improved fodder seeds like African tall and multi cut sorghum variety were introduced. Two breeds of fishes i.e Jayanthi Rohu and Katla were introduced for commercial production among four farms having with farm pond.

ICAR NIANP, Bengaluru is implementing the project in three villages at Doddaballapur taluk, Bengaluru Rural district. There is considerable improvement in the milk yield and milk fat percentage in the intervention of ASMM. More than 90% of the reproductive issues could be resolved, due to interventions under reproductive management. Awareness has been made about clean milk production, fodder varieties production, various conservation methods. Seeds, seedlings of vegetables and flowers were given to farmers under horticulture intervention. Awareness campaign and capacity building programs were organized. Impact of interventions were analysed and quantified the change in income and livelihoods of farmers have improved considerably. Employment was created among rural youth through introduction of milking machines, as a service. Introduction of milking machine, chaff cutter and rubber mats resulted in drudgery reduction among farmwomen involved in dairy farming.

3.4 AGRICULTURE TECHNOLOGY INFORMATION CENTRE (ATIC)

Farmers / Extension personnel / Stakeholders visits to ATICs: During the period under report, a total of 111090 farmers, 1812 extension personnel, 2335 students and 14103 other stakeholders visited Agriculture Technology Information Centres in the zone. Altogether, 129533 persons visited the ATICs, out of which, 52629 visited for information and 74579 visited for technology products.

Communication with stakeholders: A total of 16000 farmers contacted ATICs or were contacted by ATICs through various means of communication like phone calls from farmers (including Kisan Call Centre escalated



calls), video shows, letters received and letters replied and participation in training.

Publications: Under publications, 13532 books and 647 technical bulletins were provided to ATIC visitors or those requested by mail. A total of, 17091 farmers and other stakeholders were benefited by these publications and documents.

Technology services provided: During the reporting period, 138 soil and water testing samples were tested by the ATICs.

Technology products provided: Among different technology products, 16715 kgs of seeds and 650659 numbers of planting materials were provided to farmers.

Revenue generated: A total amount of Rs. 51160553 was generated through various technology products/publications and services provided by the ATICs. Details of item-wise revenue generated are given in Table 116.

Table 116: Income generated by ATICs in Zone XI

Product	Income generated (Rs.)
Seeds/ Planting materials	38152568
Publications/ CDs / services	1272261
Bio control agents	3180930
Other services	8554794
Grand Total	51160553

3.5 TECHNOLOGICAL BACKSTOPPING BY DIRECTORATES OF EXTENSION

Krishi Vigyan Kendras serve as a bridge between the source of technology and their stakeholders. In this process, the Directorates of Extension under various State Agricultural Universities play an important role by providing technological backstopping to the KVKs in their jurisdiction. The Directors of Extension also play a major role in coordinating and monitoring of KVK activities.

Directors of Extension and their officials participated in 37 Scientific Advisory Committee Meetings, 91 field days, 72 workshops/seminars and 120 training programs. In addition, they have attended 78 other programs including interface meetings, group discussion with KVK officials, farmers meet, animal health camp, and Krishi mela. (Table 117) Field visits to 59 on farm trials, and 80 plots of frontline demonstration were made to assess the quality of programs. The Director and his staff participated in 84 training programs and 11 Farm Field Schools conducted by the KVKs. Further, they have also guided the KVKs for preparing 43 documents on success stories / case studies.

Table 117: Details of participation by Directorates of Extension Education of SAUs

Category	Activities (No.)
Scientific Advisory Committee Meetings	37
Field days	91
Workshops/seminars	72
Technology week	17
Training programs	120
Other programmes	78
Total	415

RESEARCH PROJECTS

The project wise major achievements are presented below:

4.1. COMPLETED RESEARCH PROJECTS:

Title: Contribution of indigenous cattle in the livelihood security of farmers

Principal Investigator: D.V. Kolekar

Co-Principal Investigator: Dr. M.J. Chandre Gowda and Dr. C.V. Sairam

Project Duration: Three-year (September, 2015 - August, 2018)

Major Achievements: The population of indigenous cattle has been declining over the years. Realizing the importance of conservation of indigenous cattle for various purposes, the GOI has initiated several measures to preserve indigenous cattle, including Gokul Mission. To analyse the contribution of indigenous cattle in the economic security of farm households, the study was carried out in six districts of Karnataka based on highest population of indigenous cattle during September, 2015 - August, 2018. From each district, two taluks and from each taluk, a cluster of three villages were selected purposively. From each cluster of villages, 20 households owning indigenous and crossbred cattle were selected, thus, the total sample size was 240 farm households. Data was collected through semi-structured interview schedule and analysed by various statistical tools. The major findings of the project are as: Total milk production (L/anim./day) was more in case of crossbred cattle (6.83) as compared to indigenous cattle (2.86). Gross return per animal, per farm and per liter (Rs./day) was more in case of crossbred cattle (53.10, 91.62 & 5.69, resp.) as compared to indigenous cattle (12.98, 27.18 & 3, resp.). Without considering cost of fodder, gross return (Rs. /anim./day) was less in case of indigenous cattle (56.24) as compared to crossbred cattle (107.53). Protein, fat and calcium nourishment to the family gm/day/family was less in case of crossbred cattle (5.92, 7.59 & 0.2, resp.) as compared to indigenous cattle (44.90, 57.52 & 1.68, resp.). Nutrients to farm such as NPK kg/year was more in case of crossbred cattle (73.66, 36.83 & 147.33, resp.) as compared to indigenous cattle (56.79, 28.40 & 113.59, resp.). Employment generation (Man days/year) was more in case of crossbred cattle (80.02) as compared to indigenous cattle (42.34). Security for uncertainties and status symbol was more in case of crossbred cattle (78 & 81, resp.) as compared to indigenous cattle (18.83 & 26.33, resp.).

4.2. ONGOING RESEARCH PROJECTS:

- Title:** Analysis of Skill Development Training conducted by KVKs for the Aspirations of Participants and Constraints faced by Trainees and Trainers

Principal Investigator: Dr.M.J.Chandre Gowda, Principal Scientist (AE) and Director (Acting)

Co-Principal Investigator: Dr.M.B.Hanji, Chief Technical Officer

Project Duration: 18 months, April 18 – Sep 19

Major Achievements: A methodology was developed to measure social and occupational aspirations of rural youth participating in skill training organized by 35 centres under ASCI. The new method included measurement of the aspirations of the trainees twice, once at the beginning of the training and again at the closure of the training. Normally the aspirations are measured only once. While the first assessment reflected on the expectations, the after-training measurement of aspirations reflected

a realistic assessment of aspirations. The difference in aspirations level before and after the skill training could also be taken as an indicator of impact of training programmes. The first assessment served as the benchmark and the differences over the second assessment served as the impact.

Data collected from 744 trainees before and after the long-duration training has been compiled and computerized. Profile analysis indicated that the average age of the trainees was 34 years with majority (40%) being school drop-outs. About 24 per cent trainees were graduates and remaining had inter-mediate & vocational courses. Sixty percent trainees being already married, indicates the severity of the unemployment situation. The data related to aspirations and the impact of the training on the aspirations is being analysed.

2. Title: Study of Effectiveness of Peripatetic Training on Land Resource Inventory in Karnataka

Principal Investigator: Dr.M.J.Chandre Gowda, Principal Scientist (AE) and Director (Acting)

Co-Principal Investigator: Dr.D.V.Srinivasa Reddy, Principal Scientist (Agronomy)

Project Duration: 18 months, September 2018 – March 2020

Major Achievements: A tool to measure the gain in knowledge of farmers participating in the peripatetic training on the Land Resource Inventories was developed. The tool had questions related to personal profile, crops grown and teacher-made knowledge test with 10-items, for assessing knowledge before and after.

Before-training knowledge quotient for 10 components ranged from 14.93 to 67.16, with an overall mean of 36.09. Post-training knowledge on most components improved substantially, with an overall mean of 85.78. The knowledge gain was significant among senior farmers, farmers with lower education levels and food-crop growers as these category farmers had lower pre-training knowledge compared to counterparts.

3. Title: An analysis of management of dairy animals and their contribution in the livelihood security of farm families.

Principal Investigator: D.V. Kolekar

Co-Principal Investigator: Dr. K. Thimmappa

Project Duration: Two-year, nine month (July, 2018 - Mar, 2021)

Major Achievements: Based on available review of literature and information from various reports, websites etc. the problem has been identified and Overview of Research Work has been prepared for the research project entitled “An analysis of management of dairy animals and their contribution in the livelihood security of farm families”. The interview schedule has been prepared by keeping in view various objectives, variables of the study and other important aspects such as statistical analysis.

PUBLICATIONS

5.1 RESEARCH ARTICLES

Chandre Gowda M.J., Shrishail Dolli, Durga Prasad M.V., Saravanan D. and Sreenath Dixit, 2018, Pooled innovativeness and learning-pattern based adopter categorization, Rural Extension and Innovation Systems Journal, (International Publication by Australasia Pacific Extension Network - APEN, Australia) 14(1):41-51.

Chandre Gowda M.J., Sreenath Dixit and Megha H.L., 2018, Women Participation in Karnataka's FPOs, Economic and Political Weekly, 53(45):20-22

Mahantesh Shirur, N.S. Shivalingegowda, M.J. Chandregowda, and Rajesh K. Rana, 2018, Performance analysis of South-Indian mushroom units: imperative policy implications for their preparedness for global competitiveness, Current Science, 15(11):2141-2147

Rayudu, B.T., Akshatha, M.K., Prabhuswamy, Y.H., Reddy, D.V.S., and Sreenath Dixit, 2018. An impressive turnout of greengram variety Co (Gg) 8 under cluster frontline demonstrations through KVKs of Tamil Nadu. Res. J of Agril Sci. 9 (2): 281-286.

Rayudu, B.T., Akshatha, M.K., Reddy, D.V.S., and Sreenath Dixit, 2018. Performance of Cluster Frontline demonstrations on blackgram in Tamil Nadu: A pathway for bridging yield gap. Res. J of Agril Sci. 9 (6): 1396-1402.

Raju G. Teggelli., Shankrayya, Srinivasa Reddy, D.V. and Zahir Ahmed, 2018. Climate resilient intervention in pigeonpea under drought condition for food security. International Journal of Food Science and Nutrition.

Hari, R., Kolekar, D.V., Shyam, J., Sharma, N. K. and Patel, R. K. (2018). Adoption of Vaccination, Deworming and Artificial Insemination Practices by the Farmers of Uttar Pradesh and Maharashtra. International Journal of Livestock Research, 8 (07).

Thimmappa K and Raju R (2018). Analysis of Zero Tillage Method of Wheat Cultivation in Haryana: A Discriminant Function Approach. Journal of Soil Salinity and Water Quality. 10 (1), 126-131.

5.2 PAPERS PRESENTED IN INTERNATIONAL/NATIONAL CONFERENCES

Chandre Gowda M.J. and S.S.Dolli, 2019. Application of participatory rural appraisal along with geographical positioning system for bench mark assessment. Ashalatha K.V., Kiresur V.R., Ramesh Bhat, Hasalkar Suma and Dolli S.S. (Eds), 2019. Compendium of Abstracts of the National Conference on "Advanced Research Methodologies in Social Sciences" (ARMSS-2019) held at University of Agricultural Sciences, Dharwad, Karnataka State, India on 26-28 Feb. 2019, pp.143.

G.S. NaveenKumar, Mallikarjun B. Hanji, M.J. Chandre Gowda, K.P.Suresh and S.S. Dolli, 2019. Statistical appraisal of decision-making process in adopting agricultural innovations by farmers of Karnataka. Ashalatha K.V., Kiresur V.R., Ramesh Bhat, Hasalkar Suma and Dolli S.S. (Eds), Compendium of Abstracts of the National Conference on "Advanced Research Methodologies in Social Sciences" (ARMSS-2019) held at University of Agricultural Sciences, Dharwad, Karnataka State, India on 26-28 Feb. 2019, pp.143.

Mallikarjun B.Hanji, M.J.Chandre Gowda and N. Kumaraswamy, 2019. Applied decision support system for monitoring activities of Krishi Vigyan Kendras of Karnataka, Kerala and Lakshadweep. Ashalatha K.V., Kiresur V.R., Ramesh Bhat, Hasalkar Suma and Dolli S.S. (Eds), 2019. Compendium of Abstracts of the National Conference on "Advanced Research



Methodologies in Social Sciences” (ARMSS-2019) held at University of Agricultural Sciences, Dharwad, Karnataka State, India on 26-28 Feb. 2019, pp.143.

Srinivasa Reddy, D.V, M.J. Chandre Gowda, P.R.Ramesh, N.H.Bhandi, M.N. Malawadi, B.O.Mallikarjuna, Raju G Teggelli and C. Vidya, 2019. Sustainable intensification through Agri-Horti-Silvi-pasture in dryland areas. Presented in International Conference on Development of Drylands- 2019: Converting Dryland areas from grey into green during 11-14 February 2019 at CAZRI, Rajasthan, India. Abstracts: T-6/O-2; pp 204. Organised by International Dryland Development Commission and Arid Zone Research Association of India.

Thimmappa K, Damodaran T and Raju R. 2019. Impact of Eco-Friendly Bio-Growth Enhancer on Horticultural Crops. Presented in the XIV Agricultural Science Congress 2019 held on 20th -23rd February, 2019 at NASC Complex, New Delhi.

5.3 BOOK/ CHAPTERS

Chandre Gowda M.J., D.V. Srinivasa Reddy, Randhir Singh, Mallikarjuna B. Hanji, Moneshwari Kammar, N. Loganandhan, Bharati Hegde, 2019. Reimagining Agriculture-Farmers Innovations. ICAR-ATARI, Bengaluru, India. pp 75.

Thomas G.V, Krishnakumar V., Dhanapal R., Srinivasa Reddy D.V. (2018) Agro-management Practices for Sustainable Coconut Production. In: Nampoothiri K., Krishnakumar V., Thampan P., Nair M. (eds) The Coconut Palm (*Cocos nucifera* L.) - Research and Development Perspectives. Springer, Singapore

5.4 TECHNICAL BULLETINS

5.5 REPORT

Annual Report 2017-18, ICAR Agricultural Technology Application Research Institute (ATARI), (Eds: M.J.Chandre Gowda, D.V.S.Reddy, B.T.Rayudu, K. Thimmappa, D.V. Kolekar and Mallikarjun B.Hanji), ICAR Agricultural Technology Application and Research Institute, Zone XI, Bengaluru, India, pp.1-102.

5.6 PUBLICATIONS BY KVKs

KVK staff published 141 research papers, 148 technical bulletins, 359 popular articles and 1080 newspaper coverage and; KVKs have documented 311 extension literature, 26 books, 53 CD/DVD and 102 newsletters on various technological aspects of agriculture and its allied enterprise.

HUMAN RESOURCES DEVELOPMENT

Management Development Programme (Phase III) for Newly Recruited Programme Coordinators of KVKs was organized by ICAR-ATARI, Bengaluru during 4 - 8 January 2019. Eight newly recruited Programme Coordinators of KVKs from Zone XI participated in the programme. The participants were oriented about the baseline survey and diagnosis of field problems, prioritization of thrust areas, identifying training needs of farmers and extension personnel, preparation of annual action plan, documenting case studies, writing articles, documenting impact of KVK activities, writing of field extension and adaptive research project proposals, and administrative and accounts procedures related to KVKs. The participants opined that the programme was useful to them for managing the KVK activities.



Director and Scientists, ICAR-ATARI, Bengaluru along with the participants of Management Development Programme

Training Programmes on Public Financial Management System (PFMS) for the of KVK and Agricultural University staffs were organised in collaboration with Keral Agriculture University, UAS Raichur, UAS Dharwad and UAHS Shivamogga. A total of 4 PFMS training programmes were organized in which 158 KVK and University staff were trained. The primary objective was to establish an efficient fund flow system and expenditure network. Training programme covered topics on EAT module, mapping of agencies, bank module, creation of vendor, maker and checker, customization of vendors using excel file for salary and release of funds.

Date	Venue	Participants	No.of participants
03-04 Sept. 2018	KAU Thrissur	KVKs & KAU staff	45
17-18 Nov. 2018	UAS Raichur	KVKs and UAS Raichur staff	42
19-20 Feb. 2019	UAS Dharwad	KVKs & UAS Dharwad staff	39
25-26 Feb. 2019	UAHS Shimoga	KVKs & UAHS Shimoga Staff	32

WORKSHOPS/MEETING/ CONFERENCES

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

Dr.M.J. Chandre Gowda, Principal Scientist (Ag. Extn) and Director (Acting)

- Participated in the Launch of Agro Tourism at KVK Kottayam by Agriculture Minister of Kerala on 10 April.2018
- Participated in the Regional Committee Interim Review Meeting on 17 April 2018 at ICAR-SBI Coimbatore
- Participated in the ICAR Agriculture Extension Divisional meeting on 8th May 2018 and NFSM action plan meeting on 9 May 2018
- Served as Panel member in the International Workshop on Nutrition-Sensitive Agriculture and Nutrition Literacy, at Bhopal Madhya Pradesh, organized by Government of Madhya Pradesh and ICAR ATARI Jabalpur. 14-15, May 2018
- Conducted the Annual Review workshop of KVKs of Karnataka & Kerala at KVK Idukki form 16-19 May 2018
- Participated in the Jack Krishi Mela at KVK Kolar on 2 June 2018 at UHS Bagalkot and Government of Karnataka
- Served as the Member of the Core Committee for Curriculum Revision in Extension Education at MANAGE and attended its meetings on 22 June 2018
- External Examiner for conducting qualifying examination of Ph.D Students at UAS Dharwad on 03July 2018
- Review of KVKs by Hon'ble Minister Shri Anant Kumar Hegde, MOS Ministry of Skill Development and Entrepreneurship at KVK Dharwad on 5 July 2018
- Participated in the Cadre Review Meeting under the Chairmanship of Director General ICAR at NASC New Delhi on 18 July 2018
- Participated in the 6th Annual review workshop of National Innovations in Climate resilient Agriculture (NICRA) at NASC New Delhi during 7 August 2018
- Participate in the ARYA review workshop at NASC, New Delhi during 24 – 25, August 2018
- Participated in the Krishi Mela of UAS Dharwad on 23 September 2018
- Participated in the Government Level Meeting in Karnataka, chaired by Hon'ble Agriculture Minister, participated by all ICAR Institute Directors, on 25 September 2018
- Participated in the Government Level Meeting in Kerala, chaired by Agriculture Production Commissioner, on 03 October 2018
- Delivered Key Note address in the State level consultative workshop on Jackfruit, Pathanamthitta, Kerala, 23-24 October 2018
- Participated in Krishi Mela at CPCRI regional station, Kidu, inaugurated Hon'ble Union Minister Sri Sadananda Gowda in the presence of Sri Veerendra Heggade, Dharmadhikari of Sri Kshetra Dharmasthala on 10 November 2018



- Organized the first meeting of ICRISAT-IIHR-ATARI collaborative project under Bhoo Samrudhi Yojana of Government of Karnataka at ATARI Bengaluru on 12 Nov 2018 and participated in the review workshop at ICAR-IIHR on 19 January 2019
- Participated in the Foundation Stone Laying Ceremony of Processing and Value Addition centre sponsored by Govt of Kerala at KVK Alleppey on 23 Nov 2018
- Participated in the Brainstorming cum workshop on Good Agricultural Practices (GAP) Current status & way forward organised by agricultural extension Division ICAR at Delhi on 26 November 2018
- Inauguration of seed hub storage cum sales counter at KVK Mandya by Hon'ble Agriculture Minister, Govt. of Karnataka on 27 November 2018
- Participated as an Invited Speaker in the GIZ-GOK DoH National Level Workshop on Farmer Producer Organizations as Risk Mitigation Institutions for Small and Marginal Farmers in India Issues, Challenges and the Way Forward in Bengaluru, Karnataka, India. 4 December 2018
- Participated in the launching programme of Friends of Arecanut Tree, the skill training Programme organised jointly by CPCRI regional station Vittal & CAMPCO Puttur on 5 December 2018. The programme was inaugurated by Hon'ble Member of Parliament Sri Nalin Kumar Kateel.
- Participated in the concluding session of Value Addition for Income Generation in Agriculture (VAIGA) by KAU Thrissur on 30 December 2018
- Participated in the Directors Conference on 31 January and 1 February 2019 at NASC New Delhi
- Chaired the session on Crop Diversifications - Focused Smart Agri-Value Chains – Potato, Tomato & Onion, Nutraceuticals, Aromatic & Medicinal Plant Products, in the R&D-Industry Panel Discussion at ICAR-NIANP, 09 February 2019
- Participated as an Invited Speaker in the International Conference on Agricultural Extension and Advisory Services: Innovation to impact, organized by MANAGE and Michigan State University, Hyderabad, 12-14 February 2019
- Chaired the Technical Session in the National conference on “Biodiversity and Plant Genetic Resource conservation for future” at UAHS,

Shivamogga. Chaired the Technical Session on “Biodiversity Act 2001 and Other Policy related issues related to Biodiversity”. 15-16 March 2019

- Conducted the action plan meeting of Kerala and Lakshadweep KVKs at KAU Thrissur during 18-19 March 2018
- Participated in the Scientific Advisory Committee meetings of the following KVKs:
 - Bijapur II – 11 June 2018
 - Bijapur I – 12 June 2018
 - Bidar – 23 July 2018
 - Gulbarga I - 24 July 2018
 - Gulbarga II - 24 July 2018
 - Ballari - 28 August 2018
 - Koppal - 29 August 2018
 - Dakshina Kannada – 26 September 2018
 - Mysuru – 16 November 2018
 - Idukki - 7 December 2018
 - Kodagu - 19 December 2018
 - Davanagere – 21 December 2018
 - Pathanamthitta 17 January 2019
 - Ramanagara 6 February 2019
 - Tumakuru II – 11 February 2019
 - Tumakuru I – 6 March 2019

Dr. D.V. Srinivasa Reddy, Principal Scientist (Agronomy)

- Attended the NICRA-Annual review workshop at NASC, New Delhi and presented the progress of 7 NICRA implementing KVKs of our zone during 7-8th August 2018.
- Attended the Indo-USA Bilateral workshop on Building an operational composite drought monitoring index for India at NASC, New Delhi organized by IARI on 22 January 2019
- Attended an International conference “13th ICDD 2019” on Converting Dryland Areas from Grey into green at CAZRI, Jodhpur and presented paper on NICRA under oral presentations during 11-14 February 2019
- Sujala-III project meeting with the funding agency i.e Watershed Development Department, Govt. of Karnataka Officials at ATARI, Bengaluru on 7th April 2018.
- Meeting on Soil health governance through INM by Fertilizer Association of India at NBSS & LUP, Bengaluru on 18th April 2018.



- Attend SAC meeting of 9 KVKs in the state of Kerala and Karnataka during the year.
- Attend IMC meeting of Directorate of Cashew Research, Puttur on 7.2.19
- Annual Review meeting for KVKs of Zone-XI at KVK Idukki during 16-19th May 2018
- NICRA Annual review cum Action plan meeting for the KVKs of Zone-XI at ATARI, Bengaluru on 1st June 2018
- Strategies for doubling the farmers' income discussion at DEE, UAS, Bengaluru along with KVKs of Southern Karnataka on 14th September 2018
- Strategies for doubling the farmers income discussion at UAHS, Shimmoga along with KVKs of UAHS on 15th September 2018
- Meeting of Bhoosamrudhi project of ICRISAT/IIHR/ATARI along with 4 KVKs of Karnataka on 12th November 2018
- Attended the World Soil Health day function at KVK Dakshan Kannada on 5th December 2018.
- Attended as external member for the selection of SMS (Agro-met) and obsaretors for 4 KVK under USA, Bengaluru on 9.3.19 under DAMU project

**Dr. Thimmappa K., Senior Scientist
(Agricultural Economics)**

- Organized a team visit to Farmer FIRST Project villages in Ramanagara District on 5th April 2018.
- Organized and coordinated a team visit to Farmer FIRST Project villages in Bengaluru Rural District on 9th April 2018.
- Organized and coordinated Zonal Project Management Committee meeting of Farmer FIRST Project programme on 16th April 2018.
- Participated in Annual Workshop of KVKs of Zone XI held at KVK Idukki, Kerala during 18-19th May 2018.
- Organized and coordinated a meeting to review the reports of Doubling Farmers Income prepared by KVKs for their district on 26th June 2018.
- Organized the Pre - workshop presentation and meeting of ARYA Project on 20th August 2018 at ATARI, Bengaluru.
- Coordinated ARYA Proposal Screening Committee Meeting held during 07-10th September 2018 at Agricultural Extension Division, ICAR, Pusa, New Delhi.

- Organized and coordinated MDP for Newly Recruited PCs of KVKs as Coordinatiator at ATARI, Zone XI, Bengaluru as Programme Coordinator during 04th - 08th January 2019.
- Organized and coordinated a team visit to Farmer FIRST Project villages in Ramanagara District on 17th February 2019.
- Participated in the XIV Agricultural Science Congress 2019 held on 20th -23rd February, 2019 at NASC Complex, New Delhi.

Dr. D. V. Kolekar, Scientist (Ag. Extn)

- Organized five days MDP for Newly Recruited heads of KVKs from zone VIII during 04-08.01.2019 at ATARI, Pune.
- Organised workshop cum training programme on CFLD oilseeds and pulses for Maharashtra KVKs during 24-25.11.2018 at DBSKKV, Dapoli.
- Organised workshop cum training programme on CFLD oilseeds and pulses for Gujarat KVKs during 7-9.12.2018 at KVK Bhavnagar.
- Assisted in organizing first IMC meeting of ICAR-ATARI, Pune at ICAR-CIFE, Mumbai on 28.01.2019.
- Associated in organization of Annual Review cum Action Plan Workshop (2017-18) of KVKs of Zone VIII with collaboration with MPKV Rahuri at MPKV Rahuri during 5-7 May, 2018.
- Associated in organization of Annual Zonal Review Workshop of KVKs of Zone XI during 16-19 May, 2018 at KVK Idukki.
- Organised zonal review workshop of Farmer FIRST Programme on 25 November 2018 at DBSKKV, Dapoli.
- Organised zonal review workshop of ARYA Project on 8 December 2018 at KVK Bhavnagar.
- Organized two days state level annual action plan workshop of Gujarat KVKs in collaboration with NAU, Navasari at NAU, Navasari during 1st to 2nd March 2019.
- Organized two days state level annual action plan workshop of Maharashtra and Goa KVKs at KVK, Baramati during 15th to 16th March 2019.
- Attended NICRA Annual Review Workshop at NASC, Delhi during 07-08.08.2018.
- Attended Mid-term review meeting of 9 KVKs under the jurisdiction of DE, UAS, Dharwad at KVK Belgaum-II on 02.11.2018.
- Attended Kissan mela cum farmers group meeting at KVK Satara-I on 23.11.2018.

PERSONNEL STAFF IN POSITION

Staff working in the Agricultural Technology Application Research Institute, Zone XI, Bengaluru as on March 31st, 2019 is presented below

Cadre	Name	Designation
Research Management Position	Dr. M.J. Chandre Gowda	Director (Acting)
Scientific	Dr. D.V. Srinivasa Reddy	Principal Scientist (Agronomy)
	Dr. B.T. Rayudu	Principal Scientist (Agricultural Extension)
	Dr. Thimmappa K	Senior Scientist (Agricultural Economics)
	Dr. D.V. Kolekar	Scientist (Agricultural Extension)
Technical	Dr. Mallikarjun B. Hanji	Chief Technical Officer (Computer)
	Shri. Hemanth Kumar	Driver
Administrative	Shri. Shaik Rukman	Assistant. Finance & Accounts Officer
	Shri. J. Mathew	Assistant Administrative Officer
	Mrs. Ramola Pinto	Junior Stenographer
	Shri. N. Vinod Kumar	Lower Division Clerk
	Ms. K. Roopakala	Lower Division Clerk