

वार्षिक प्रतिवेदन २०१९

ANNUAL REPORT 2019

ATARI Bengaluru



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

ICAR-Agricultural Technology Application Research Institute

Zone XI, Hebbal, Bengaluru - 560 024



भाकृअनुप
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Dr. Chandre Gowda M.J

The Indian Council of Agricultural Research, with the continued support of Govt. of India over the years, has built a strong network of Krishi Vigyan Kendras (KVKs) as its frontline extension network in the country. The KVK system has created a niche for itself and earned an irrefutable reputation of being the most dependable network for delivering science-led technology development. The KVK system is administratively hosted by diverse host organizations, both government and non-government, and stands out as a perfect example for public-private partnership in the service of farming community. The strategic and visionary leadership provided at the national level by Secretary DARE & DG ICAR and DDG (Agricultural Extension) has been instrumental in the successful functioning of KVK system throughout the country. The Agricultural Technology Application Research Institutes (ATARI) are spearheading the KVK system at the zonal level by closely monitoring and coordinating with diverse stakeholders. The KVKs have the multi-fold advantage of the administrative ownership of the host organizations, technical support of the research system and, the financial and supervisory support of ICAR ATARIs. With this, the KVKs are running as a well-oiled machine carrying on its shoulders the goals of national leadership on one hand and the dreams of millions of farmers on the other hand. True to expectations, the KVKs in the States of Karnataka, Kerala and Lakshadweep have performed with commitment and passion for the welfare of farming community besides facilitating other stakeholders to support farming community as well. Despite adversities in the form of unprecedented rainfall during August 2019 in Kerala and Karnataka, the KVKs stood by farming community with necessary technical and humanitarian support.

As a part of the regular mandated activities, 48 KVKs assessed 538 technological options sourced from within and outside the states for providing a basket of alternatives to farmers, thereby enabling them to address location specific problems in different agro-climatic situations. Besides, demonstrated large number of successful technologies in the farmers fields. KVKs played catalytic role in uptake of eco-friendly technologies by producing and providing 3244.27 quintals of bio-products, besides 2.27 lakh numbers of traps/cards to farmers. Besides implementing the on-going activities under cluster frontline demonstrations in oilseed & pulses, national innovations in climate resilient agriculture, attracting and retaining youth in agriculture, skill training; KVKs implemented several new initiatives launched by Govt. of India like jala shakthi abhiyaan, fertilizer awareness campaign, paramparagath krishi vikas yojana, nutri-cereal demonstrations, nutri-gardens, national animal disease control programme, tree planting campaign, soil health management and so on in the exercise of taking these to the doorstep of farmers.

Annual Report 2019 is a trend setter for the fact that the reporting period is changed from financial year to calendar year. As a result, this is a compilation of the achievements for the period January to December 2019. Another major shift is the switchover to digital modes of budget management through Public Finance Management System (PFMS), and new platforms like KVK Portal, Websites and other ICT applications to depict KVK achievements. It is a matter of great pleasure to present before the readers a concise statement of achievements of ATARI Bengaluru and KVKs in the states of Karnataka, Kerala and Lakshadweep for the year 2019.

22.06.2020
Bengaluru


CHANDRE GOWDA M J

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कृषि विज्ञान केन्द्र भारतीय कृषि अनुसंधान परिषद, नई दिल्ली की अग्रिम पंक्ति विस्तार प्रणाली का देश भर फैला एक राष्ट्रीय नेटवर्क है। कृषि विज्ञान केन्द्रों की गतिविधियों की निगरानी और गतिविधियों का समन्वयन उप महानिदेशक (कृषि विस्तार) के समग्र मार्गदर्शन और मदद के तहत राष्ट्रीय स्तर पर कृषि विस्तार प्रभाग और क्षेत्रीय स्तर पर कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान (अटारी) द्वारा किया जाता है। भा.कृ.अनु.प.-अटारी, बेंगलूरु, क्षेत्र-8 का कार्यक्षेत्र कर्नाटक, केरल और लक्षद्वीप है, जिसके तहत क्रमशः 33, 14 और 1 कृषि विज्ञान केन्द्र हैं। इस क्षेत्र के 48 कृषि विज्ञान केन्द्रों में से 33 कृषि विज्ञान केन्द्र राज्य कृषि विश्वविद्यालयों के तहत, 8 कृषि विज्ञान केन्द्र गैर-सरकारी संगठनों के तहत और 7 कृषि विज्ञान केन्द्र भारतीय कृषि अनुसंधान परिषद के संस्थानों प्रशासनिक नियंत्रण के तहत हैं।

भा.कृ.अनु.प.-अटारी का अधिदेश, प्रौद्योगिकी का अनुप्रयोग और अग्रिम पंक्ति विस्तार शिक्षा कार्यक्रमों का समन्वयन और निगरानी; और कृषि विस्तार अनुसंधान और ज्ञान-प्रबंधन को मज़बूती प्रदान करना है। कृषि विज्ञान केन्द्रों का अधिदेश प्रौद्योगिकी के अनुप्रयोग और क्षमता-विकास के लिए इसका मूल्यांकन और प्रदर्शन है। यह अधिदेश प्रक्षेत्र-परीक्षण, अग्रिम पंक्ति प्रदर्शन, क्षमता-विकास, ज्ञान एवं संसाधन केन्द्र के रूप में सेवा और कृषि-परामर्श प्रदान करते हुए प्राप्त किया जाता है।

अटारी, बेंगलूरु की प्रमुख गतिविधियाँ

- भा.कृ.अनु.प.-अटारी, बेंगलूरु, विस्तार शिक्षा सोसाइटी, कोयम्बतूर और भा.कृ.अनु.प.-जे.एस.एस. कृषि विज्ञान केन्द्र, मैसूरु द्वारा संयुक्त रूप से 14-16 दिसंबर, 2019 के दौरान कृषि अनुसंधान एवं विकास को मज़बूत करने के लिए विस्तार विषय पर अंतर्राष्ट्रीय सम्मेलन आयोजित किया गया।
- कृषि विज्ञान केन्द्र, चिकमंगलूरु में 14-16 मई 2019 के दौरान कर्नाटक, केरल और लक्षद्वीप के कृषि विज्ञान केन्द्रों की क्षेत्रीय समीक्षा कार्यशाला (2018-19) आयोजित की गई।
- भा.कृ.अनु.प.-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान, बेंगलूरु ने 09 मई 2019 को क्षेत्र-9, बेंगलूरु और क्षेत्र-8, पुणे के फार्मर्स फस्ट कार्यक्रम की समीक्षा व कार्य-योजना कार्यशाला आयोजित की।
- विस्तार निदेशालय, कृषि विश्वविद्यालय, धारवाड़ में 25-27 अप्रैल, 2019 के दौरान कर्नाटक (क्षेत्र-9) के कृषि विज्ञान केन्द्रों के लिए कार्य-योजना कार्यशाला (2019-20) आयोजित की गई।
- कृषि विश्वविद्यालय, तृशूर के किसान भवन में 18-20 मार्च, 2019 के दौरान केरल और लक्षद्वीप के कृषि विज्ञान केन्द्रों के लिए वार्षिक कार्य-योजना कार्यशाला (2019-20) आयोजित की गई।

प्रौद्योगिकी का मूल्यांकन

- कृषि विज्ञान केन्द्रों ने 235 प्रक्षेत्र परीक्षण आयोजित किए, जिनमें विभिन्न फसलों के तहत 199, पशुधन के तहत 28 और गृह विज्ञान के तहत 8 शामिल थे। इन प्रक्षेत्र परीक्षणों का आयोजन 538 प्रौद्योगिकियों के परीक्षण के लिए किया गया था, जिनमें से फसलों के तहत 464, पशुधन के तहत 57 और गृह विज्ञान के तहत 17 शामिल थे। इन गतिविधियों में 1051 किसान/परीक्षण, 829 फसलों के तहत, 107 पशुधन के तहत और 115 गृह विज्ञान के तहत थे।

- फसलों के तहत कृषि विज्ञान केन्द्रों ने 199 प्रक्षेत्र परीक्षण आयोजित किए, जिनमें से 141 कर्नाटक में और 58 केरल में थे। परीक्षित/मूल्यांकित 464 प्रौद्योगिकीय विकल्पों में से 326 परीक्षण कर्नाटक और 138 केरल में थे। कर्नाटक के कृषि विज्ञान केन्द्रों ने 527 परीक्षण चलाए, जबकि केरल के कृषि विज्ञान केन्द्रों ने 302 परीक्षण चलाए। इस प्रकार कुल परीक्षण 829 थे।
- पशुधन वर्ग में कृषि विज्ञान केन्द्रों ने 28 प्रक्षेत्र परीक्षण चलाए, जिनमें से 16 कर्नाटक में और 12 केरल में थे। यह कार्य 107 परीक्षणों के माध्यम से किया गया, जिनमें से 69 कर्नाटक में और 38 केरल में थे। इस प्रक्रिया में कृषि विज्ञान केन्द्रों ने 57 प्रौद्योगिकियों का मूल्यांकन किया, जिनमें से 39 कर्नाटक में और 18 केरल में थे।
- गृह विज्ञान के तहत सभी परीक्षण कर्नाटक में ही किए गए, जिनमें से कृषि विज्ञान केन्द्रों ने 8 परीक्षण चलाए, जिनमें 17 प्रौद्योगिकीय विकल्पों के मूल्यांकन के लिए 115 परीक्षण शामिल थे।

अटारी, बंगलूरु की प्रमुख गतिविधियाँ

- वर्ष 2019 के दौरान फसलों के तहत अनाज तथा ज्वार, बाजरा व रागी से संबंधित 900, तिलहनों से संबंधित 61, दलहनों से संबंधित 320, व्यावसायिक फसलों से संबंधित 127, रेशेदार फसलों से संबंधित 35, चारा फसलों से संबंधित 157, सब्जी फसलों से संबंधित 459, कन्द्रीय फसलों से संबंधित 45, फल फसलों से संबंधित 177, फूलों से संबंधित 50, रोपण फसलों से संबंधित 75, मसाला एवं औषधीय फसलों से संबंधित 95 तथा विभिन्न फसलों के संकरों से संबंधित 356 प्रदर्शन आयोजित किए गए।
- कर्नाटक में धान के तहत, समेकित फसल प्रबंधन, समेकित कीट प्रबंधन, समेकित पोषकतत्व प्रबंधन, समेकित रोग प्रबंधन जैसी प्रौद्योगिकियों, उन्नत किस्मों, जैसे जीनएनवी-10-90, गंगावती सोना और केकेपी-5, लवणता के प्रति सहनशील किस्मों जीजीवी-05-01 और परिस्थिति-अनुकूल कीट-प्रबंधन ने संबंधित तुलनीय किस्मों की अपेक्षा 5.05 से 18.61% अधिक उपज दी। केरल में समेकित फसल प्रबंधन, संसाधन-संरक्षण,

समेकित पोषकतत्व-प्रबंधन, समेकित जल-प्रबंधन, समेकित कीट व रोग प्रबंधन, समेकित रोग प्रबंधन, जैविक खेती जैसी प्रौद्योगिकियों और पौर्णमी एवं अक्षया जैसी किस्मों ने किसानों की पद्धति (43.72 किं./हे.) की तुलना में औसतन 54.97 किं./हे. की उपज दी।

- मँडुआ से संबंधित किस्मवार प्रदर्शन में केएमआर-204, केएमआर-360, एमएल-365, केएमआर-340 और केएमआर-204 शामिल थे, जिनमें से केएमआर-204 किस्म ने सबसे अधिक उपज (29.56 किं./हे.) दी। कर्नाटक में रागी-लोबिया की द्विफसल प्रणाली ने सर्वाधिक उपज (20.50 किं./हे.) और शुद्ध आय रु. 61516/- दी।
- रबी में ज्वार, समेकित फसल प्रबंधन, उन्नत किस्मों एसपीपी-2217, जीएस-23 और फॉल आर्मी कीट प्रबंधन प्रौद्योगिकियों का प्रदर्शन किया गया, जिसने स्थानीय तुलनीय किस्म की 11.08 किं./हे. की तुलना में औसतन 13.32 किं./हे. की उपज दी।
- गौण मिलेट के तहत, कोदो मिलेट की किस्म आरके 390-25 का प्रदर्शन किया गया, जिसकी उपज 7.2 किं./हे. थी, प्रोसो मिलेट की समेकित फसल प्रबंधन पद्धति ने 11.5 किं./हे. की उपज दी, साँवाँ की किस्म डीएचबीएम 93-3 ने 12.43 किं./हे. की उपज दी और आकस्मिक फसल के रूप में कुटकी की किस्म पोषिता ने 2.85 किं./हे. की उपज दी।
- समेकित कीट व रोग प्रबंधन पद्धति सहित मूँगफली के प्रदर्शन का निष्पादन किसानों की पद्धति से बेहतर (22.30 किं./हे.) था। किस्म जीपीबीडी-4 में सबसे अधिक उपज (25.1 किं./हे.) दर्ज हुई, जो किसानों की स्थानीय किस्म (22 किं./हे.) की तुलना में 14.36% अधिक थी।
- दलहनों में, मटर के साथ अंतरवर्ती फसल क्रिया से अधिकतम उपज (33.8 किं./हे.) प्राप्त हुई, जिसके बाद समेकित पोषकतत्व प्रबंधन के तहत (17.36 किं./हे.)। मूँग की किस्म बीजीएस-9 ने किसानों पद्धति (6.37 किं./हे.) की तुलना में 9.5 किं./हे. की उपज दी। उड़द के प्रदर्शनों में समेकित फसल प्रबंधन और समेकित पोषकतत्व

प्रबंधन के कारण स्थानीय तुलनीय किस्म की तुलना में उपज 38.55% बढ़ी। केरल में सूक्ष्म-सिंचाई के साथ में उड़द के प्रदर्शन में 5.54 किं./हे. की उपज प्राप्त हुई।

- कर्नाटक में कपास में, किस्म के सूत्रपात और अंतरवर्ती फसल प्रदर्शन में बीजीय कपास की उपज किसानों की पद्धति की तुलना में क्रमशः 25.46 किं./हे. और 24.71 किं./हे. थी।
- कर्नाटक और केरल के कृषि विज्ञान केन्द्रों ने 454 किसानों के 76.07 हे. क्षेत्र में चौलाई, बैंगन, फूलगोभी, मिर्ची, कद्दूवर्गीय फसल, खीरा, सेम, फ्रेंचबीन, ग्वार फली, मटर, प्याज, टमाटर, तुरई, करेला, लंबी लोबिया, तरबूज और सब्जी लोबिया जैसी सब्जी फसलों का प्रदर्शन उन्नत प्रौद्योगिकियों के साथ किया।
- वर्ष 2019 के दौरान कर्नाटक और केरल के कृषि विज्ञान केन्द्रों के द्वारा आलू, सुरन, कस्सावा जैसी कन्द फसलों पर 10.03 हे. में 45 प्रदर्शन आयोजित किए गए। सुरन की किस्म गजेन्द्र का प्रदर्शन, समेकित पोषकतत्व प्रबंधन और जैव-गहन कीट व रोग प्रबंधन से स्थानीय किस्मों की तुलना में अधिक उपज प्राप्त हुई। केरल में कस्सावा के प्रदर्शन ने किसानों की पद्धति की 372 किं./हे. और रु. 141575 की शुद्ध आय की तुलना में 421 किं./हे. की उपज और रु. 209635 की शुद्ध आय दी।
- इस वर्ष के दौरान कर्नाटक और केरल के 177 किसानों को शामिल करते हुए 48.62 हे. में केला, अंगूर, नींबूवर्गीय फल, आम, पपीता, अनार, कूर्ग संतरा, नींबू और अमरुद के प्रदर्शन आयोजित किए गए।
- सुपारी, नारियल, कॉफी और काजू जैसी रोपण फसलों के तहत कर्नाटक और केरल के कृषि विज्ञान केन्द्रों ने 24.30 हेक्टेयर में 75 प्रदर्शन आयोजित किए।
- मसाला फसलों में, कर्नाटक में 4.9 हेक्टेयर में 40 प्रदर्शन और केरल के 10 कृषि विज्ञान केन्द्रों ने 4.38 हेक्टेयर में 55 प्रदर्शन आयोजित किए।
- पुष्प फसलों में गेंदा की किस्म अर्का अग्नि ने किसान की किस्म (52.5 किं./हे.) की तुलना में

71.25 किं./हे. की उपज दी। रजनीगंधा की किस्म अर्का प्रज्वल में समेकित फसल प्रबंधन प्रौद्योगिकी ने किसानों की पद्धति (150 किं./हे.) की तुलना में 25% अधिक उपज (187 किं./हे.) दी।

- कर्नाटक और केरल के कृषि विज्ञान केन्द्रों ने संकरो के तहत विभिन्न फसलों, जैसे धान, मक्का, टमाटर, सूरजमुखी, पत्तागोभी, मिर्ची, बैंगन, कद्दूवर्गीय फसल, गेंदा, प्याज, तरबूज, खरबूजा, में 122.62 हेक्टेयर क्षेत्र में 356 प्रदर्शन चलाए, जिनमें तुलनीय किस्मों की तुलना में अधिक उपज प्राप्त हुई।
- कर्नाटक और केरल के कृषि विज्ञान केन्द्रों ने 8.8 हेक्टेयर में विभिन्न कृषि यंत्रों के 60 प्रदर्शनों के माध्यम से कृषि में यंत्रीकरण को लोकप्रिय किया।
- मूल्य-संवर्धन, प्रसंस्करण और रेशम-उत्पादन जैसे अन्य उद्यमों में 114 प्रदर्शन इकाइयों की स्थापना से कर्नाटक और केरल के 244 किसानों/कृषक महिलाओं को फायदा मिली।
- कर्नाटक और केरल के कृषि विज्ञान केन्द्रों ने कुक्कुड़-पालन सहित पशुधन के 552 प्रदर्शन आयोजित किए। डेयरी प्रबंधन प्रौद्योगिकियों, जैसे संकर नस्ल के गायों में दुग्ध ज्वर की रोकथाम और नियंत्रण, निर्मदचक पशुओं में सीआईडीआर सिंक, नैदानिक और उप-नैदानिक स्तनशोथ की रोकथाम, देशी गायों में पोषक तत्व एवं हॉर्मोन संबंधी प्रबंधन, चारा फसल, एजोला-उत्पादन और इसका दूध-उत्पादन पर प्रभाव, दूध-उत्पादन को बढ़ाने के लिए साइलेज का उत्पादन, हाइड्रोपोनिक चारा-उत्पादन तथा क्षेत्र-विशेष खनिज-मिश्रण का प्रदर्शन किया गया।
- कटला, रोहु, एवं सामान्य कार्प मछलियों का संयुक्त मछली-पालन, प्रक्षेत्र तालाब में तिलापिया की खेती, प्रक्षेत्र तालाब में अंतर्स्थलीय मात्स्यिकी, भण्डारण तालाब में मछली-पालन और पिंजरे में मछली-पालन जैसी तकनीकियाँ लागू की गईं।

क्षमता-उन्नयन

- कृषि विज्ञान केन्द्रों ने 4926 प्रशिक्षण पाठ्यक्रम आयोजित किए, जिनमें किसानों/कृषक महिलाओं के लिए 3358 पाठ्यक्रम, ग्रामीण युवाओं के लिए 503 पाठ्यक्रम, और विस्तारकर्मियों के लिए 223 पाठ्यक्रम शामिल थे। इन पाठ्यक्रमों के माध्यम से

168429 व्यक्तियों को प्रशिक्षित किए गए, जिनमें 116628 किसानों/कृषक महिलाएँ, 17671 ग्रामीण युवा और 9385 विस्तारकर्मी शामिल थे। इसके अतिरिक्त, 21867 एवं 2878 प्रतिभागियों के लिए क्रमशः 717 प्रयोजित कार्यक्रम और 125 व्यावसायिक पाठ्यक्रम भी आयोजित किए गए।

- किसानों और कृषक महिलाओं के प्रशिक्षण का मुख्य विषय फसल-उत्पादन था, जिसमें 703 पाठ्यक्रम चलाए गए, जिनमें 27190 किसानों/कृषक महिलाओं ने भाग लिए। इसके बाद अधिक पसंदीदा पाठ्यक्रम पौध-संरक्षण (498) और गृह विज्ञान/महिला सशक्तिकरण (484) थे। इसके बाद मृदा-स्वास्थ्य एवं प्रजनन-शक्ति प्रबंधन (381) का स्थान था।
- ग्रामीण युवाओं के मुख्य प्रशिक्षण पाठ्यक्रम मूल्य-संवर्धन (51 पाठ्यक्रम, 1574 प्रतिभागी) और बागवानी फसलों का पौधशाला-प्रबंधन (40 पाठ्यक्रम, 1494 प्रतिभागी) पर थे।
- विस्तारकर्मियों के प्रशिक्षण में जल-प्रबंधन के साथ में जैविक खेती तथा नवाचारी कृषि पद्धतियाँ मुख्य विषय थे, जिन पर 57 पाठ्यक्रम चलाए गए और इनमें 2011 प्रतिभागियों ने भाग लिया।
- मृदा-स्वास्थ्य और प्रजनन-शक्ति प्रबंधन पर कई प्रयोजित प्रशिक्षण पाठ्यक्रम (190) आयोजित किए गए, जिनमें 7261 किसानों/ग्रामीण युवाओं/विस्तार कर्मियों ने भाग लिया। इसके बाद कृषि विस्तार का स्थान था, जिस पर 183 कार्यक्रम चलाए गए, जिनमें 1850 प्रतिभागियों ने भाग लिया।
- व्यावसायिक प्रशिक्षण पाठ्यक्रम मुख्यतः समेकित फसल प्रबंधन पर आयोजित किए गए थे, जिन पर 24 पाठ्यक्रम चलाए गए और इनमें 538 प्रतिभागियों ने भाग लिया।

प्रमुख विस्तार कार्यक्रम

- कृषि विज्ञान केन्द्रों ने किस्मवार निष्पादन, उत्पादन तकनीकियाँ, समेकित कीट व रोग प्रबंधन, पशु-स्वास्थ्य एवं पोषण, कुक्कुड़ की उत्पादन तकनीकी, मात्स्यिकी और मनुष्य-पोषण जैसे कृषि के विभिन्न पहलुओं और इससे संबद्ध क्षेत्रों के बारे में कुल 92980 विस्तार गतिविधियों

का आयोजन किया और 19.68 लाख किसानों, 2.96 लाख अनुसूचित जाति/जनजाति के किसानों और 1.05 लाख विस्तारकर्मियों को जागरूक किया गया।

- कृषि विज्ञान केन्द्रों ने समाचार पत्रों में कवरेज (1691), रेडियो कवरेज/व्याख्यान (289), टेलिविजन कवरेज/व्याख्यान (163), सीडी/डीवीडी (38), प्रदर्शिनियाँ (204) और किसान मेला (80) के अतिरिक्त विस्तार पुस्तिकाएँ (894), लोकप्रिय लेख (368) और शोध पत्र/सारांश (162) प्रकाशित किए।

उत्पादन-प्रौद्योगिकी संबंधी सामग्रियाँ

- कृषि विज्ञान केन्द्रों ने विभिन्न फसल-किस्मों के 2478.98 किं. बीजों, विभिन्न फसलों एवं संकरों की 26.09 लाख रोपण सामग्रियों और 2.54 पशुधन नस्लों एवं छोटी मछलियों का उत्पादन कर वितरित किया गया, जिससे 1.36 लाख किसान लाभान्वित हुए।
- उक्त अवधि के दौरान, कृषि विज्ञान केन्द्रों ने 3244.27 किं. जैविक उत्पादों का उत्पादन एवं वितरण किया गया, जिससे 0.89 लाख किसानों को कीटों व रोगों की जैविक नियंत्रण विधियों को अपनाने के लिए प्रेरित किया गया और उनकी मदद की।

किसानों को मोबाइल के द्वारा सलाहकार सेवाएँ

- इस क्षेत्र के 42 कृषि विज्ञान केन्द्रों ने 35.71 लाख किसानों को 10216 टेक्स्ट संदेश भेजे। ये संदेश फसलों (4756), मौसम (4091), कृषि विज्ञान केन्द्र की गतिविधियों के बारे में जागरूकता (494), पशुधन (456), अन्य उद्यम (310) और विपणन (109) के बारे में थे।

मिट्टी, जल एवं पौध-विश्लेषण

- कृषि विज्ञान केन्द्रों ने 19170 गाँवों के 40034 किसानों से प्राप्त मिट्टी, जल, पौधे और जैविक खादों के 43626 नमूनों का विश्लेषण किया। इसके आधार पर किसानों को 23189 मृदा-स्वास्थ्य कार्ड वितरित किए।

विश्व मृदा दिवस का आयोजन

- इस क्षेत्र के 44 कृषि विज्ञान केन्द्रों ने दिसंबर 5, 2019 को विश्व मृदा दिवस मनाया, जिसमें 5,556 किसानों ने भाग लिया था और इस कार्यक्रम के दौरान 3269 मृदा-स्वास्थ्य कार्ड वितरित किए गए। इस अवसर पर मंत्रियों, सांसदों, पार्षदों सहित 34 अति विशिष्ट व्यक्ति, 116 अन्य जन-प्रतिनिधि और 302 अधिकारीगण उपस्थित थे। विश्व मृदा दिवस समारोह का व्यापक प्रसारण 105 मीडिया द्वारा किया गया।

वर्षा-जल-संचयन

- सोलह कृषि विज्ञान केन्द्रों में वर्षा-जल-संचयन इकाइयाँ स्थापित की गईं, जिनके उपयोग से 53 प्रशिक्षण कार्यक्रमों और 67 प्रदर्शनों का आयोजन किया गया। इस सुविधा के इस्तेमाल से कृषि विज्ञान केन्द्रों के उपयोग और किसानों को वितरित करने के लिए 177137 रोपण सामग्रियाँ तैयार की गईं। लगभग 22,593 किसानों और 1,995 अधिकारियों ने इन इकाइयों का दौरा किया और वर्षा-जल-संचयन की तकनीकों की जानकारी ली।

कृषि विज्ञान केन्द्रों का संबंध एवं संपर्क

- 'आत्मा' (ATMA) के साथ संबंध स्थापित करने के रूप में कृषि विज्ञान केन्द्रों ने इस वर्ष 'आत्मा' (ATMA) द्वारा आयोजित 721 कार्यक्रमों में भाग लिया और साथ ही साथ कृषि विज्ञान केन्द्रों ने 'आत्मा' (ATMA) के सहायोग से 434 कार्यक्रम आयोजित किए।
- विभिन्न कार्यक्रमों और गतिविधियों के आयोजन के लिए कृषि विज्ञान केन्द्रों को बाह्य संस्थाओं से धनराशि प्राप्त हुई थी। राष्ट्रीय कृषि विकास योजना, राष्ट्रीय खाद्य सुरक्षा मिशन, भा.कृ.अनु.प. के विभिन्न संस्थानों की परियोजनाएँ और नबार्ड कृषि विज्ञान केन्द्रों की गतिविधियों की मदद करने वाली प्रमुख एजेंसियाँ थीं।

सफल गाथाएँ

कृषि विज्ञान केन्द्रों के सतत् प्रयासों के कारण निम्नलिखित प्रौद्योगिकियाँ व्यापक क्षेत्रों में फैली हैं। इन प्रौद्योगिकियों ने उत्पादकता बढ़ाने, खेती की लागत करने और आय बढ़ाने में किसानों की मदद की है।

- केएलई कृषि विज्ञान केन्द्र, बेलगावी-II में गन्ने में फसल-अवशेष-प्रबंधन
- कृषि विज्ञान केन्द्र, कलबुरगी-I में मटर में दलहन मेजिक ने पैदावार को बढ़ाया।
- कृषि विज्ञान केन्द्र, बेंगलूरु ग्रामीण में समेकित पद्धतियों के माध्यम से बेल वाली बीन्स में पीले मोजेक विषाणु का प्रबंधन
- कृषि विज्ञान केन्द्र, चित्रदुर्गा में चित्रदुर्गा जिले में रागी की किस्म एमएल-365 का फैलाव।
- कृषि विज्ञान केन्द्र, कोलार में पेड़ शहतूत - वर्षा-आधारित रेशम-उत्पादन के लिए वरदान।
- कृषि विज्ञान केन्द्र, उत्तर कन्नड़ा में दुधारु पशुओं में आवर्ती प्रजनन के प्रबंधन में संशोधित पीजी प्रोटोकॉल।
- कृषि विज्ञान केन्द्र, एरणाकुलम में सैटालाइट उत्पादन केन्द्र : साझेदार किसानों को आय, कृषि विज्ञान केन्द्र के अननुकूल स्थानों के लिए समाधान।
- कृषि विज्ञान केन्द्र, इडुविक, केरल में इडुविक जिले में धान की खेती का पुनरुद्धार।

इन प्रौद्योगिकियों, कृषि विज्ञान केन्द्रों की तकनीकी उत्पादक-सामग्रियों एवं तकनीकी मार्गदर्शन की मदद से कई किसानों को प्राकृतिक संसाधनों के अनुरक्षण के साथ ही पैदावार, आय के संबंध में बहुत अधिक फायदे हुए हैं। परिणामस्वरूप वे आदर्श किसानों के रूप में उभरे और उनमें से कुछ का उल्लेख सफल गाथाओं के रूप में नीचे दिया गया है:

- कृषि विज्ञान केन्द्र, कोडगु में कॉफी-आधारित कृषि प्रणाली में डेयरी से आय।
- कृषि विज्ञान केन्द्र, कोप्पल में कृषि+बागवानी+वन-संवर्धन।
- कृषि विज्ञान केन्द्र, गदग में स्थानीय बकरी के उन्नयन के माध्यम से आजीविका सुरक्षित करना।
- कृषि विज्ञान केन्द्र, हासन में आलू बोने के मशीन से पूरे कंद फसलों की रोपाईं ने लाभ दिया।
- कृषि विज्ञान केन्द्र, हावेरी में अलसी की हरी खाद ने शहतूत की पत्ती-उपज बढ़ाया।
- कृषि विज्ञान केन्द्र, कण्णूर में मथिल धान उत्पादक कंपनी।
- कृषि विज्ञान केन्द्र, आलप्पुषा में समेकित कृषि प्रणाली की सफल गाथा।

पुरस्कार एवं मान्यताएँ

- श्री सी.एच. मुहम्मद, चुण्डन वीट्टिल, मण्डयपुरत्तु हाउस, वेट्टम पी.ओ., मलप्पुरम जिला, केरल को "जगजीवन राम अभिनव किसान का क्षेत्रीय पुरस्कार-2018" प्राप्त हुआ।
- कृषि विज्ञान केन्द्र, दावणगेरे को सर्वश्रेष्ठ क्षेत्रीय कृषि विज्ञान केन्द्र का "पंडित दीन दयाल उपाध्याय कृषि विज्ञान राष्ट्रीय प्रोत्साहन पुरस्कार-2018" प्राप्त हुआ।

विशेष कार्यक्रम

- कर्नाटक और केरल के कृषि विज्ञान केन्द्रों ने किसानों के 1345 हेक्टेयर खेतों में दलहनों पर समूह अग्रिम पंक्ति प्रदर्शन के तहत तुअर, मूँग, मटर, चना और लोबिया पर 3363 प्रदर्शन आयोजित किए।
- कर्नाटक और केरल के कृषि विज्ञान केन्द्रों ने किसानों के 790 हेक्टेयर खेतों में तिलहनों पर समूह अग्रिम पंक्ति प्रदर्शन के तहत मूँगफली, सोयबीन, सूरजमुखी, काला तिल, अलसी, सरसों

और तिल की फसलों पर 1300 प्रदर्शन आयोजित किए।

- कृषि विज्ञान केन्द्रों के आठ बीज हब ने दलहनों के 2989.66 किं. बीज उत्पादित किए, जिसमें चना (1636 किं.), मटर (953.40 किं.), तुअर (312.41 किं.), मूँग (83.75 किं.) और लोबिया (4.10 किं.) शामिल हैं।
- राष्ट्रीय जलवायु-अनुकूल कृषि नवाचार परियोजना के तहत सात अत्यंत संवेदनशील जिलों, जैसे कर्नाटक के बेलगावी (सूखा/ताप), दावणगेरे (सूखा/ताप), चिकबल्लापुरा (सूखा/ताप), तुमकूरु (सूखा), गदग (सूखा/ताप) और कलबुरगी (सूखा/ताप) तथा केरल के आलप्पी (जलप्लावन/जल-निकासी) में प्रौद्योगिकियों का प्रदर्शन चलाए गए।
- 998.53 हेक्टेयर क्षेत्रों को एनआरएम से संबंधित उपचारों उपचारित किया गया, जिससे 773 किसान लाभान्वित हुए। प्रौद्योगिकियों के माध्यम से जलवायु-अनुकूलता के सृजन के लिए 480 हेक्टेयर क्षेत्रफल में फसलों पर 1262 प्रदर्शन आयोजित किए गए।
- तुअर (डीबीजीवी-5), लोबिया (केसी-8), रागी (एमएल-365), कँगनी (डीएचएफटी-109-3, आरएस-118), कोदो (स्थानीय), कुटकी (सीओ-2), बारहमासी चारा फसल (सीओएफएस-29/31), मटर (टीएस-3आर, बीआरजी-2 और बीआरजी-5) जैसी जलवायु-अनुकूल किस्मों का प्रदर्शन खरीफ में किया गया।
- रबी में चना (जैकी-9218) और रबी ज्वार (एसपीवी-2217, एम-35-1) का प्रदर्शन किया गया और इन्हें राज्य कृषि विभाग की फसल-योजना में शामिल किया गया।
- 149 विस्तार गतिविधियों के द्वारा 4339 किसानों को कृषि एवं संबद्ध क्षेत्रों पर जलवायु से संबंधित प्रभावों के बारे में जागरूक किया गया, जिनमें 1106 महिला कृषक शामिल थीं।
- युवाओं को कृषि के प्रति आकर्षित करने और स्थिर रहने के लिए 45 प्रशिक्षण कार्यक्रम आयोजित किए गए, जिनसे 688 ग्रामीण युवा लाभान्वित हुए।
- कर्नाटक सरकार की सुजला-3 परियोजना के तहत भू-संसाधन वस्तुसूची पर किसानों के क्षमता-उन्नयन कार्यक्रम 2019 के दौरान 11 कृषि

- विज्ञान केन्द्रों ने चालू रखे। इस अवधि के दौरान 201 प्रशिक्षण कार्यक्रमों के द्वारा 201 गाँवों के 8934 किसानों का क्षमता-उन्नयन किया गया।
- क्षेत्र-9 में पीपीवी एवं एफआरए छह जागरूकता कार्यक्रम आयोजित किए गए, जिनसे 735 किसान लाभान्वित हुए।
 - भा.कृ.अनु.प.-अटारी और इसके कृषि विज्ञान केन्द्रों ने 16-31 दिसंबर 2019 के दौरान स्वच्छता पखवाड़ा मनाया गया और सफाई, स्वास्थ्य एवं स्वच्छता के बारे में कई गतिविधियाँ चलाई, जिनमें 13280 प्रतिभागियों ने भाग लिया।
 - 'मेरा गाँव मेरा गौरव' कार्यक्रम के तहत भा.कृ.अनु.प. के 10 संस्थानों के वैज्ञानिकों के 126 बहु-विषयक दलों ने कृषि एवं संबद्ध क्षेत्रों के विभिन्न पहलुओं पर 3098 गतिविधियों के आयोजन के द्वारा 565 गाँवों में 101235 किसानों और अन्य साझेदारों की मदद की।
 - भारत सरकार की ग्रामीण कृषि मौसम सेवा योजना के तहत कर्नाटक के 12, केरल के 3 और लक्षद्वीप के एक कृषि विज्ञान केन्द्रों को फेस-1 में जिला कृषि मौसम इकाई की सहायता प्राप्त हुई। इस अवधि के दौरान 139959 किसानों ने कृषि-परामर्श के लिए पंजीकृत किया और इनमें से 86505 किसानों को कृषि-परामर्श दिए गए। इन केन्द्रों ने 34 जागरूकता कार्यक्रम भी आयोजित किए, जिनसे 2005 किसान लाभान्वित हुए।
 - उर्वरक-जागरूकता अभियान के तहत कृषि विज्ञान केन्द्रों ने उर्वरकों के सही उपयोग पर जागरूकता कार्यक्रम आयोजित किए, जिनमें 5158 किसानों और 544 विस्तार कर्मियों ने भाग लिया।
 - आठ कृषि विज्ञान केन्द्रों, जैसे रायचूर, यादगीर, वयनाड, तुमकूरु-2, कोडगु, कासरगोड, आलप्पुषा और कोषिककोड, को अपने अनुदेशात्मक प्रक्षेत्रों में सूक्ष्म-सिंचाई प्रणालियों पर प्रदर्शन इकाई स्थापित करने के लिए मदद दी गई। इन सुविधाओं का इस्तेमाल करते हुए कृषि विज्ञान केन्द्रों ने 1200 किसानों को जल-बचाव पद्धतियों को अपनाने के लिए प्रेरित किया गया।
 - 33343 किसानों और 2608 विस्तार कर्मियों को शामिल करते हुए जल शक्ति अभियान कार्यक्रम आयोजित किए गए।

- कृषि विज्ञान केन्द्रों में राष्ट्रीय पशु रोग-नियंत्रण कार्यक्रम अभियान चलाए गए, जिनमें 1259 पशुओं का टीकाकरण और कृत्रिम गर्भाधान किया गया। इस कार्यक्रम में 4433 किसान और 625 विस्तार कर्मी शामिल थे।
- कृषि विज्ञान केन्द्रों ने इफको के सहयोग से वृक्षारोपण अभियान चलाए, जिसके तहत 19213 पौधे लगाए, जिसमें 5560 किसानों और 1015 विस्तार कर्मियों ने भाग लिया।
- कर्नाटक और केरल के 40 जिलों में राष्ट्रीय टिकाऊ कृषि मिशन के तहत मृदा-स्वास्थ्य प्रबंधन की उप-योजना, परंपरागत कृषि विकास योजना, लागू की गई।

किसानों को प्राथमिकता

- तीन केन्द्रों ने किसानों को प्राथमिकता योजना लागू करना चालू रखा और फसल, बागवानी, पशुधन, प्राकृतिक संसाधन प्रबंधन, उद्यम और समेकित कृषि प्रणाली मॉड्यूल में प्रक्षेत्र स्तर पर कई परीक्षण लागू किया। इसके तहत 28 गाँवों/वार्डों में कुल 1930 परिवार लाभान्वित हुए।

कृषि प्रौद्योगिकी सूचना केन्द्र

- इस क्षेत्र के कृषि प्रौद्योगिकी सूचना केन्द्रों में 148044 किसान पधारें। कृषि प्रौद्योगिकी सूचना केन्द्रों ने 60321 किसानों को कृषि के विभिन्न पहलुओं से संबंधित जानकारी दी। इस अवधि के दौरान 87723 किसानों ने इन केन्द्रों में उपलब्ध तकनीकी उत्पाद खरीदे।

विस्तार निदेशालय द्वारा तकनीकी मदद

- विस्तार निदेशालय और उनके अधिकारियों ने नियमित तौर पर कृषि विज्ञान केन्द्रों की निगरानी की और राज्य कृषि विश्वविद्यालयों, गैर-सरकारी संगठनों और भा.कृ.अनु.प.-संस्थानों के अधीन वाले कृषि विज्ञान केन्द्रों की मदद की। इस अवधि के दौरान निदेशालय ने 34 वैज्ञानिक सलाहकार समिति की बैठकों, 126 कृषि दिवसों, 125 कार्यशालाओं/संगोष्ठियों तथा 157 प्रशिक्षण कार्यक्रमों में भाग लिया। कृषि विज्ञान केन्द्रों द्वारा आयोजित 52 प्रक्षेत्र परीक्षणों और 133 अग्रिम पंक्ति प्रदर्शन प्रक्षेत्रों का दौरा करते हुए प्रक्षेत्र स्तरीय निगरानी भी की गई।

प्रकाशन

- भा.कृ.अनु.प.–अटारी, बेंगलूरु के वैज्ञानिकों ने शोध पत्र प्रकाशित किए(3), राष्ट्रीय/अंतर्राष्ट्रीय सम्मेलनों में शोध पत्र प्रस्तुत किए (14), पुस्तकों (4) और रिपोर्टों (1) का संपादन किया। कर्नाटक के कृषि विज्ञान केन्द्रों ने 100 शोध पत्र, 146 तकनीकी रिपोर्ट, 44 तकनीकी बुलेटिन, 291 लोकप्रिय लेख और 236 विस्तार साहित्य प्रकाशित किए। केरल के कृषि विज्ञान केन्द्रों ने कृषि एवं संबद्ध क्षेत्रों के विभिन्न तकनीकी पहलुओं पर 34 शोध पत्र, 29 तकनीकी बुलेटिन, 29 तकनीकी रिपोर्ट, 6 तकनीकी बुलेटिन, 88 लोकप्रिय लेख और 67 विस्तार पुस्तिकाएँ प्रकाशित कीं।

मानव संसाधन विकास

- भा.कृ.अनु.प.–अटारी, बेंगलूरु ने कृषि विज्ञान केन्द्रों के नवनियुक्त कार्यक्रम समन्वयकों के लिए 04-08 जनवरी 2019 के दौरान प्रबंधन विकास कार्यक्रम आयोजित किया।

- तीन संस्थानों में कृषि विज्ञान केन्द्रों के कर्मचारियों को सार्वजनिक वित्तीय प्रबंधन प्रणाली (पीएफएमएस) पर प्रशिक्षण कार्यक्रम आयोजित किए गए।
- सितंबर 2019 के दौरान भा.कृ.अनु.प.–अटारी, बेंगलूरु ने कृषि विज्ञान केन्द्रों के नवनियुक्त कर्मचारियों के लिए दो अभिमुखीकरण कार्यक्रम आयोजित किए, एक कृषि विज्ञान केन्द्र, मैसूरु में और दूसरा कृषि विज्ञान केन्द्र, कासरगोड में।

कार्यशाला, बैठक और सम्मेलन

- इस अवधि के दौरान भा.कृ.अनु.प.–अटारी, बेंगलूरु के वैज्ञानिकों ने वैज्ञानिक कार्यशालाओं (11), बैठकों (12) और सम्मेलनों (3) में भाग लिया।

Krishi Vigyan Kendras (KVKs) is the nation-wide network of frontline extension system of the Indian Council of Agricultural Research (ICAR), New Delhi. The Agricultural Extension Division at the national level and the Agricultural Technology Application Research Institutes (ATARI) at the Zonal level monitor and coordinate the activities of Krishi Vigyan Kendras under the overall guidance and support of DDG Agricultural Extension. 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 ICAR-ATARI has the mandate of 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. This mandate is achieved through on-farm testing, frontline demonstration, capacity development, serving as knowledge and resource centre and provide farm advisories.

Major Activities at ATARI Bengaluru

- 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.
- Action Plan Workshop for KVKs of Karnataka (Zone-XI) for the year 2019-20 was organized at the Directorate of Extension, University of Agricultural Sciences, Dharwad during 25-27 April, 2019.
- The ICAR-Agricultural Technology Application Research Institute, Bengaluru organized the Review cum Action Plan Workshop of Farmer FIRST Programme of Zone XI, Bengaluru & Zone VIII, Pune on 9th May, 2019.
- Zonal Review Workshop (2018-19) of KVKs in Karnataka, Kerala, & Lakshadweep was organized at KVK Chikkamagaluru during 14-16, May 2019.
- The International Conference on Extension for Strengthening Agricultural Research and Development (eSARD 2019) was jointly organized by ICAR ATARI Bengaluru, Extension Education Society, Coimbatore and ICAR JSS Krishi Vigyan Kendra Mysuru for three days during 14-16, December 2019.

Major Achievements of KVKs

Technology Assessment

- The KVKs conducted 235 On Farm Tests (OFTs) which included 199 under crops, 28 under livestock and 8 under home science enterprises. These OFTs were conducted to test 538 technologies of which 464 were under crops, 57 under livestock and 17 under home science enterprises. These activities involved a total of 1051 farmers/trials, 829 under crops, 107 under livestock and 115 under home science enterprises.
- Under Crops, the KVKs conducted 199 OFTs, which included 141 OFTs in Karnataka and 58 in Kerala. Out of the 464 technological options tested / assessed, 326 were tested in Karnataka and 138 in Kerala. Karnataka KVKs laid out 527 trials whereas Kerala KVKs laid out 302 trials, making up a total of 829 trials.
- In the livestock category, the KVKs conducted 28 OFTs, 16 in Karnataka and 12 in Kerala. This was done by laying out 107 trials, 69 in Karnataka and 38 in Kerala. In the process, the KVKs assessed 57 technological options, 39 in Karnataka and 18 in Kerala.
- All the home science enterprises were reported from Karnataka wherein KVKs conducted 8 OFTs by involving 115 trials to assess 17 technological options.

Frontline demonstrations

- Under crops, 900 demonstrations were conducted on cereals and millets, 61 on oilseeds, 320 on pulses, 127 on commercial crops, 35 on fibre crops, 157 on fodder crops, 454 on vegetable crops, 45 on tuber crops, 177 on fruit crops, 50 on flowers, 75 on plantation crops, 95 on spice and medicinal crops and 356 on hybrids of various crops, during 2019.
- In paddy, technologies such as ICM, IPM, INM, IDM, improved varieties viz. GNV-10-90, Gangavathi Sona and KKP-5, salt tolerant variety GGV-05-01 and eco-friendly pest management gave 5.05 to 18.61 % increase in grain yield over their respective local check in the state of Karnataka. In Kerala, technologies such as ICM, Resource conservation, INM, IWM, IPDM, IDM, organic cultivation and varietal population such as Pournami and Akshaya gave on an average 54.97q/ha yield as compared to farmers' practice(43.72q/ha).
- Finger millet varietal demonstration included KMR 204, KMR-360, ML-365, KMR 340 and KMR 204, out of which KMR 204 variety yielded the max yield of 29.56.q/ha. Finger millet-cowpea double cropping gave higher net return of Rs.61516/ha in the state of Karnataka.
- In rabi sorghum, ICM, improved varieties SPV-2217, GS-23 and fall armyworm management technologies were demonstrated that gave an average of 13.32q/ha as against 11.08q/ha in local check.
- Under minor millets, kodo millet variety RK 390-25 was demonstrated with 7.2 q/ha yield, proso millet integrated crop management practices gave 11.5 q/ha, barnyard millet variety DHBM 93-3 recorded yield of 12.43 q/ha and small millet var. Poshitha, as contingent crop, yielded 2.85 q/ha.
- Groundnut crop demonstrations with Integrated Pest and Disease Management performed better (22.30 q/ha) as compared to farmers' practice. The highest yield of 25.1 q/ha was recorded by variety GPBD-4, which is 14.36% higher than the farmers local variety (22 q/ha).
- In pulses, intercropping of pigeonpea with maize has recorded highest yield of 33.8 q/ha (CEY), followed by 17.36q/ha under integrated nutrient management. Greengram variety BGS-9 produced 9.5q/ha as compared to 6.37q/ha in farmers' practice. In blackgram demonstrations, overall yield increase due to ICM and INM was 38.55% over local check. In Kerala, demonstrations in blackgram with micro irrigation, recorded a yield of 5.54 q/ha.
- In cotton, seed cotton yield was 25.46 q/ha and 24.71 q/ha, respectively in varietal introduction and intercropping demonstrations as compared to farmers' practice in the state of Karnataka.
- Vegetable crops such as amaranthus, brinjal, cauliflower, chilli, cucurbits, cucumber, field bean, french bean, cluster bean, green pea, onion, tomato, ridge gourd, bitter gourd, yard long bean, watermelon and vegetable cowpea were demonstrated with improved technologies under 454 farmers' fields covering an area of 76.07 ha by the KVKs of Karnataka and Kerala states.
- A total of 45 demonstrations were conducted on major tuber crops like potato, elephant foot yam and cassava covering an area of 10.03 ha by the KVKs of Karnataka and Kerala during 2019. Demonstration in elephant foot yam crop on variety Gajendra, INM, and bio intensive pest & disease management recorded superior yield as compared to local checks. Cassava demonstrations resulted in higher yield of 421 q/ha, and net return of Rs. 209635 /ha as compared to 372q/ha and net returns of Rs. 141575/ha in farmers practice in the state of Kerala.
- Fruit crops demonstrations on banana, grapes, citrus, mango, papaya pomegranate, Coorg mandarin, lime and guava were conducted with 177 farmers of Karnataka and Kerala covering an area of 48.62 ha during the year.
- In plantation crops like arecanut, coconut, coffee and cashew, 75 demonstrations were undertaken by the KVKs of Karnataka and Kerala covering an area of 24.30 ha.



- In spices, a total of 40 demonstrations were conducted in an area of 4.9 ha in Karnataka and 55 demonstrations were implemented by 10 KVKs of Kerala covering 4.38 ha area.
- Flower crops demonstrations in marigold variety Arka Agni recorded higher yield of 71.25 q/ha as compared to 52.5 q/ha in farmers' variety. ICM technology with Arka Prajwal variety in tube rose has given 25% higher yield (187 q/ha) as compared to 150 q/ha in farmers' practice.
- Under hybrids, 356 demonstrations were conducted in various crops by the KVKs in the states of Karnataka (341) and Kerala (15) covering 122.62 ha area in crops like paddy, maize, tomato, sunflower, cabbage, chilli, brinjal, cucurbits, marigold, onion, tomato, watermelon, muskmelon etc. with higher yields as compared to check.
- Farm mechanization was popularized through 60 demonstrations on various farm implements covering an area of 8.80 ha during the year by KVKs of Karnataka and Kerala.
- A total of 114 demonstrations units were established on other enterprises such as value addition, processing and sericulture benefiting 244 farmers/farm women in the states of Karnataka and Kerala.
- A total of 552 demonstrations were conducted in livestock including poultry by the KVKs of Karnataka and Kerala. Dairy management technologies such as prevention and control of milk fever in cross breed cows, CIDR synch in anoestrus animals, prevention of subclinical and clinical mastitis, nutritional and hormonal management in indigenous cows, fodder crops, azolla production and its impact on milk yield, silage production, hydroponic fodder production and area specific mineral mixture to enhance milk yield were demonstrated.
- Technologies such as composite fish culture of catla, rohu and common carp, monoculture of Tilapia in farm pond, promotion of inland

fisheries in farm pond, fish culture in storage ponds and cage culture were implemented.

Capacity Development

- KVKs organized 4926 training courses which included 3358 courses for farmers/farmwomen, 503 courses for rural youth, and 223 courses for extension personnel. Through these courses, 168429 persons were trained comprising of 116628 farmers/farmwomen, 17671 rural youth, 9385 extension personnel. In addition, 717 sponsored and 125 vocational courses were organized for 21867 and 2878 participants.
- For farmers and farmwomen, the major area of training was crop production in which 703 courses were conducted involving 27190 farmers/ farmwomen. Training courses on plant protection (498) and home science/women empowerment (484) were the next most demanded courses followed by soil health and fertility management (381 courses).
- For rural youth, value addition (51 courses, 1574 participants) and nursery management of horticultural crops (40 courses, 1494 participants) were the major training areas.
- For extension functionaries, organic cultivation with water management and innovative agriculture practices were the major areas with 57 courses and 2011 participants.
- Large number of sponsored training courses (190) were organized on soil health and fertility management with the participation of 7261 farmers/rural youth/extension functionaries followed by agricultural extension with 183 programs and 1850 participants.
- Vocational training courses were mostly organized on integrated crop management with 24 courses and 538 participants.

Frontline extension programmes

- KVKs organized a total of 92980 extension activities and created awareness among 19.68 lakh farmers, 2.96 lakh SC/ST farmers and 1.05 lakh extension personnel on various aspects of agriculture and its allied sectors like varietal performance, production technologies, integrated pest and disease management, animal health and nutrition, production technologies of poultry, fisheries and human nutrition.
- KVKs published extension literature (894), popular articles (368) and research papers/abstracts (162), besides newspaper coverage (1691), radio coverage/talks (289), T V coverage/talks (163), CDs/DVDs (38), exhibitions (204) and Kisan melas (80).

Production of technological inputs

- KVKs produced and supplied 2478.98 q of seeds of different crop varieties, 26.09 lakh planting material of different crops and hybrids, and 2.54 lakh number of livestock strains and fish fingerlings benefiting 1.36 lakh farmers.
- During the period, KVKs produced and supplied 3244.27 q of bio-products through which 0.89 lakh farmers were motivated and supported to adopt biological control of pests and diseases.

Kisan Mobile Advisory Services

- 42 KVKs of the zone sent 10216 text messages to 35.71 lakh farmers. The messages were related to crops (4756), weather (4091), awareness about KVK activities (494), livestock (456), other enterprises (310), and marketing (109).

Soil, Water and Plant Analysis

- KVKs analysed 43626 samples of soil, water, plant, and organic manure received from 40034 farmers belonging to 19170 villages based on which 23189 soil health cards were distributed to farmers.

World Soil Day Celebration

- The World Soil Day was celebrated on December 5, 2019 at 44 KVKs of the zone with participation of 5,556 farmers, wherein 3269 soil health cards were distributed. On the occasion, 34 VIPs including ministers, MPs, MLAs, 116 other public representatives, and 302 officials. The celebration of world soil day was given wide publicity through 105 media coverage.

Rainwater Harvesting Units

- Rainwater harvesting and recycling units established in 16 KVKs were utilized to organize 53 training courses and conduct 67 demonstrations. The facility was used to produce 177137 planting material for use in KVKs and to provide to farmers. These units were visited by 22,593 farmers and 1,995 officials and got acquainted with the rainwater harvesting techniques.

Convergence and Linkages of KVKs

- As part of convergence with ATMA, KVKs participated in 721 programmes organized by ATMA during the year and at the same time KVKs organized 434 programmes in collaboration with ATMA.
- External funding was received by the KVKs to organize various programs and activities. Rashtriya 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 agencies that funded/supported KVK activities.

Success stories

As a result of persistent efforts of the KVKs, the following technologies have spread to larger area. The technologies have helped farmers in terms of enhancing productivity, reducing cost of cultivation and augmenting income:

- Crop residue management in sugarcane at KLE KVK, Belagavi-II
- Pulse magic promoted yield in Pigeonpea at KVK, Kalaburagi-I
- Management of Yellow mosaic virus in Pole beans through integrated approach at KVK, Bangalore Rural
- Spread of Finger millet variety ML-365 in Chitradurga district at KVK, Chitradurga
- Tree mulberry – A boon for rainfed sericulture at KVK, Kolar
- Modified PG protocol in management of repeat breeding in dairy animals at KVK, Uttara Kannada
- Satellite Production Centres: Income for partner farmers, solution to unfavourable location of KVK at KVK, Ernakulam
- Revitalization of rice farming in Idukki District at KVK, Idukki

With the help of technologies, technological inputs and technical guidance of KVKs, many farmers have reaped rich dividends in terms of yield, income while maintaining the natural resources. As a result, they have emerged as model farmers and some of them are listed as success stories hereunder:

- Income from Dairy in coffee based farming system at KVK Kodagu
- Agri+Horti+Silviculture at KVK, Koppal
- Enhancing the livelihood through upgradation of local goat at KVK, Gadag
- Whole tuber planting with Potato planter gave profit at KVK, Hassan
- Sunhemp green manuring crop increases mulberry leaf yield at KVK, Haveri

- Mayyil Rice Producers Company at KVK, Kannur
- Success story in Integrated Farming System at KVK Alappuzha

Awards and Recognition

- Sh.C.M.Mohamed, Chundan Veetil, Mandayapurathu House, Vettom PO, Malappuram Distt., Kerala received Jagjivan Ram Abhinav Kisan Puraskar /Jagjivan Ram Innovative Farmer Zonal Award-2018.
- KVK Davanagere received the Zonal Best KVK "Pandit Deen Dayal Upadhyay Krishi Vigyan Rashtriya Protsahan Puraskar 2018.

Special Programmes

- Under cluster frontline demonstrations on pulses, 3363 demonstrations on blackgram, greengram, pigeonpea, chickpea and cowpea were conducted by KVKs of Karnataka and Kerala in an area of 1345 ha of farmers fields.
- Under cluster frontline demonstrations on oilseeds, 1300 demonstrations on groundnut, soybean, sunflower, niger, linseed, mustard and sesame crops were conducted by KVKs of Karnataka and Kerala in 790 ha of farmers fields.
- Eight seed hub KVKs produced 2989.66 q seeds of pulses which included chickpea (1636 q), pigeonpea (953.40 q), blackgram (312.41 q), greengram (83.75 q), and cowpea (4.10 q).
- Under National Innovations in Climate Resilient Agriculture (NICRA), technology demonstrations were implemented in seven most vulnerable districts, namely Belagavi (drought/heat), Davanagere (drought/heat), Chikkaballapura (drought/heat), Tumkur (drought), Gadag (drought/heat) and Kalaburagi (drought/heat) in Karnataka and Alleppey (water inundation/drainage) in Kerala.

- 998.53 ha area has been treated with NRM related treatments benefiting 773 farmers. To build climate resilience through technologies, 1262 demonstrations were conducted on crops covering 480 ha area.
- Climate resilient varieties in blackgram (DBGV-5), cowpea (KC-8), finger millet (ML-365), foxtail millet (DHFt-109-3, R.S.-118), kodo millet (Local), little millet (CO-2), perennial fodder crop (CoFS-29/31), pigeon pea (TS-3R, BRG-2 and BRG-5) were demonstrated in Kharif. During rabi, varieties in chickpea (JAKI-9218) and rabi sorghum (SPV-2217, M-35-1) were demonstrated and have been incorporated in state agriculture department crop plans.
- 149 extension activities created awareness among 4339 farmers, including 1106 women farmers about the climate related impacts on the agriculture and related sector.
- Under Attracting and Retaining Youth in Agriculture (ARYA), 45 training programmes were conducted that benefited 688 rural youth.
- Farmers capacity building on land resource inventory under Sujala III project of Government of Karnataka was continued during 2019 by 11 KVKs. During the period, capacity building of 8934 farmers of 201 villages was achieved through 201 training programmes.
- Six awareness programs on PPV&FRA were organized in Zone-XI benefiting 735 farmers.
- The ICAR-ATARI and its KVKs observed Swachhta Pakhwada during 16-31 December, 2019 and organized various activities related to cleanliness, health and hygiene with involvement of 13280 participants.
- Under *Mera Gaon Mera Gaon* (MGMG) programme, 126 multidisciplinary teams of Scientists of 10 ICAR institutes helped 101235 farmers in 565 villages by conducting 3098 activities on various aspects of agriculture and allied sectors wherein benefitted and other stakeholders.
- Under *Gramin Krishi Mausam Sewa* scheme of Government of India, 12 KVKs of Karnataka, three KVKs of Kerala and one KVK in Lakshadweep (1), were supported with District Agricultural Meteorological Unit (DAMU) in Phase I. During the period, 139959 farmers are registered for receiving agro advisories, out of which, 86505 farmers were provided with agro advisories. These centres also conducted 34 awareness programmes benefitting 2005 farmers.
- Under fertilizer awareness campaign, KVKs organized awareness programme on right use of fertilizers wherein a total of 5158 farmers and 544 extension personnel took part.
- Eight KVKs viz., Raichur, Yadgir, Wayanad, Tumakuru-II, Kodagu, Kasaragod, Alappuzha and Kozhikode were supported to establish demonstration units on micro irrigation systems in their instructional farms. By using the facilities, the KVKs motivated 1200 farmers to adopt water saving approaches.
- Jal Shakti Abhiyan was organized by involving 33343 farmers and 2608 extension personnel.
- National Animal Disease Control Programme (NADCP) campaign was facilitated in the KVKs wherein 1259 animals were treated with vaccination and artificial insemination. The campaign involved 4433 farmers and 625 extension personnel.
- Tree plantation campaign supported by IFFCO was organized by the KVKs whereby 19213 plants were planted with the participation of 5560 farmers and 1015 extension personnel.

- Paramparagat Krishi Vikas Yojana (PKVY), a sub-component of Soil Health Management (SHM) scheme under National Mission of Sustainable Agriculture (NMSA), was implemented in 40 districts in Karnataka and Kerala.

Farmers' FIRST

- Three centers continued to implement the Farmer FIRST programme and implemented several interventions at the field level in crop, horticulture, livestock, natural resource management, enterprise and integrated farming system modules. A total of 1930 households in 28 villages/wards were benefited under this programme.

Agricultural Technology Information Centers

- A total of 148044 farmers visited Agriculture Technology Information Centres (ATICs) in the Zone. ATICs provided information related to various aspects of farming to 60321 farmers. The technological products available in these centres were purchased by 87723 farmers during the period.

Technological backstopping by Directorate of Extension

- Directors of Extension and their officials regularly monitored the KVKs and extended technical backstopping to KVKs under SAUs, NGOs, and ICAR Institutes. During the period, directorate participated in 34 Scientific Advisory Committee Meetings, 126 field days, 125 workshops/seminars and 157 training programmes. Field level monitoring was done by visiting 52 on farm trials and 133 plots of frontline demonstrations organized by the KVKs.

Publications

- Scientists of ICAR ATARI Bengaluru published research papers (3), presented papers at national/international conferences (14), edited books (4) and reports (1). KVK in Karnataka published 100 research papers, 146 technical reports, 44 technical bulletins, 291 popular articles and 236 extension literatures. Kerala KVKs published 24 research papers, 29 technical reports, 6 technical bulletins, 88 popular articles and 67 extension literatures on various technological aspects of agriculture and its allied enterprise.

Human Resource Development

- Management Development Programme for newly recruited Programme Coordinators of KVKs was organized by ICAR-ATARI, Bengaluru during 04th January to 08th January 2019.
- The training programmes for KVK staff on the Public Financial Management System (PFMS) were conducted in 3 institutes.
- Two orientation programmes were organized by ICAR ATARI Bengaluru for the newly recruited staff of KVKs, one at KVK Mysuru and the other at KVK Kasaragod during September 2019.

Workshops, Meetings and Conferences

- The scientists of ATARI attended scientific workshops (11), meetings (12) and conferences (3) during the reporting period.

ABOUT ICAR - AGRICULTURAL TECHNOLOGY APPLICATION RESEARCH INSTITUTE (ATARI)

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) since IV Five Year Plan in the country. KVKs are hosted by ICAR institutes, SAUs, State Government Departments and Non-Governmental Organizations (NGOs) with 100% financial support of Government of India. The Agricultural Extension Division headed by the Deputy Director General (Agricultural Extension) monitors and reviews the KVKs through 11 ICAR-Agricultural Technology Application Research Institutes (ATARIs) located in the country. The jurisdiction of ICAR-ATARIs is illustrated in Table 1.

Table 1: States and UTs covered by ICAR-ATARIs in the country

Zones	States/UTs (No.)	Name of states/UTs
I	5	Punjab, Uttarakhand, Himachal Pradesh, UT of Jammu & Kashmir, Ladakh
II	3	Rajasthan, Haryana, NCT of Delhi
III	1	Uttar Pradesh
IV	2	Bihar, Jharkhand
V	3	West Bengal, Odisha, UT of Andaman & Nicobar
VI	3	Assam, Arunachal Pradesh, Sikkim
VII	5	Tripura, Nagaland, Manipur, Mizoram, Meghalaya
VIII	5	Maharashtra, Gujarat, Goa, UT of Daman and Diu, Dadra & Nagar Haveli
IX	2	Madhya Pradesh, Chhattisgarh
X	4	Andhra Pradesh, Telangana, Tamil Nadu, UT of Puducherry
XI	3	Karnataka, Kerala, UT of 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 programmes.
- 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), Bengaluru in September, 1981. The jurisdiction included then was Karnataka, Kerala, Tamil Nadu, Puducherry and Lakshadweep. The unit was converted as a Plan Scheme with additional staff in 1986 and additional objective of monitoring the other Transfer of Technology projects of ICAR viz., KVK, Trainers Training Centre (TTC), National Demonstration Scheme (NDS), Operational Research Project (ORP), Scheduled Caste and Scheduled Tribe Project and Special Project on Oilseeds.

During 1990-91, another objective of implementing and monitoring of National Pulse Project was added, besides addition of Goa to the jurisdiction of the zone. The ZCU was upgraded as Zonal Project Directorate (ZPD) in March, 2009 and as Agricultural Technology Application Research Institute (ATARI) since 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 31.12.2019

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 KVKs functioning under this institute is depicted in Fig.1.

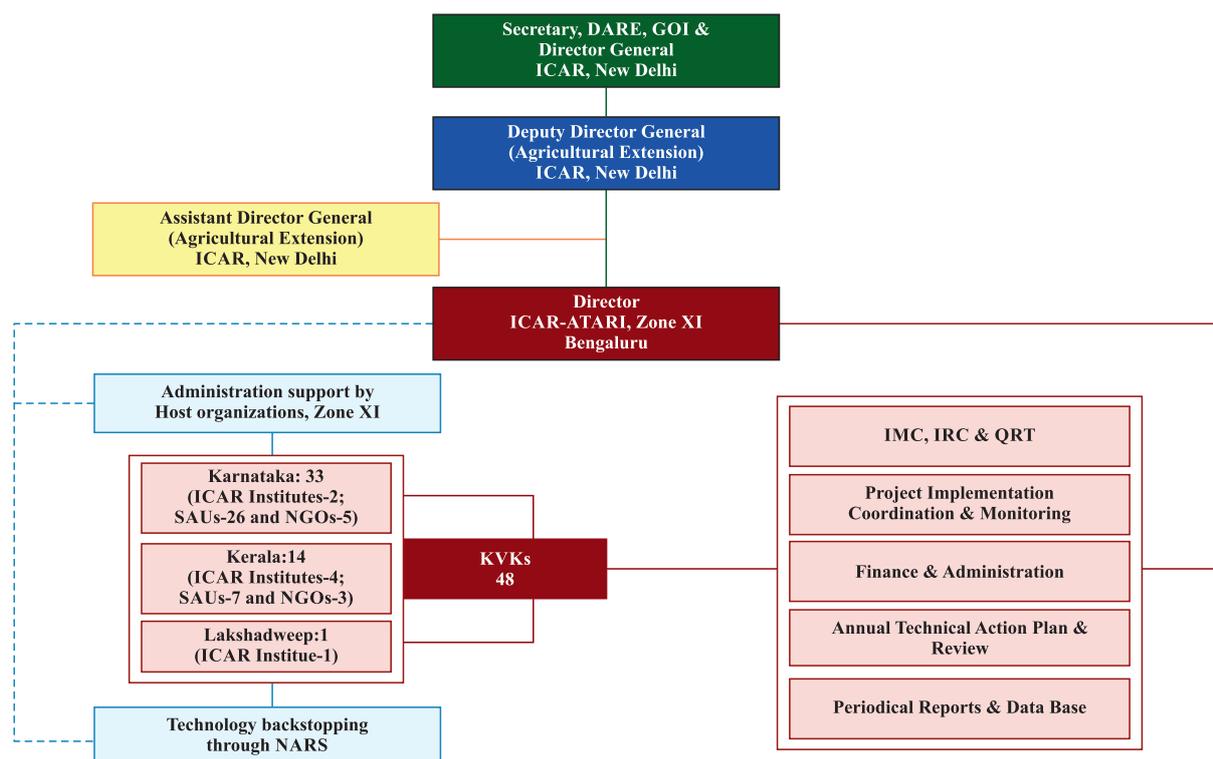


Fig 1: Organizational structure and nature of activities of ICAR-ATARI, Zone-XI, Bengaluru

1.2.4 Major activities

1.2.4.1 International conference on extension for strengthening agricultural research and development (eSARD 2019)

The international conference on extension for Strengthening Agricultural Research and Development (eSARD 2019) was inaugurated by Dr. A. K. Singh, Deputy Director General (Agricultural Extension), ICAR, New Delhi in the presence of His Holiness Sri Jagadguru Shivaratri Deshikendra Mahaswamiji on 14 December, 2019 at Suttur, Mysuru on the eve of Silver Jubilee celebration of KVK, Mysuru, which was established in 1994 under the host institute JSS Mahavidyapeetha.

Dr. P. Das, former DDG(Agricultural Extension), ICAR; Dr. S. Rajendra Prasad, Vice Chancellor, University of Agricultural Sciences, Bengaluru; Dr. M. Mahadevappa, former Chairman, ASRB New Delhi; Dr. C.G. Betsurmamath, Executive Secretary, JSS Mahavidyapeetha; Prof. Dr. Philip H., President, Extension Education Society Coimbatore; and Dr. M.J. Chandre Gowda, Director (Acting), ICAR-ATARI, Bengaluru were present.

This conference was jointly organized by ICAR-ATARI, Bengaluru, Extension Education Society,

Coimbatore and ICAR-Krishi Vigyan Kendra, Mysuru for three days during 14-16 December, 2019 with the objective of bringing together agricultural extension scientists, researchers, academicians, professionals, students and many other stakeholders for a purposeful dialogue to get deeper insights into the current dynamics and for drawing future roadmap for agricultural extension in the country.

Dr.P.Das, Former Deputy Director General (Agricultural Extension) gave Keynote address during the inaugural session. Prof. Murari Suvedi, Michigan State University and Fulbright Scholar at IGNOU, New Delhi spoke on Global Extension Systems and its Relevance for Indian context. Dr.P.Chandrashekhara, DG, NIAM deliberated on Value Chain and Market Led Extension. Dr.(Mrs.) Govind Kelkar, Senior Advisor, Landessa Development Institute addressed the gender perspectives. Dr.K.Narayana Gowda, Former Vice Chancellor, University of Agricultural Sciences, Bengaluru was the Chief Guest for the valedictory session.



Dr. A. K. Singh, Deputy Director General (Agricultural Extension), ICAR, New Delhi, in the divine presence of His Holiness Sri Jagadguru Shivaratri Deshikendra Mahaswamiji, inaugurating the eSARD 2019



Dr. A. K. Singh, Deputy Director General (Agricultural Extension), ICAR, New Delhi giving inaugural address

1.2.4.2 Annual review workshop of KVKs

Annual review workshop (2018-19) of KVKs in Karnataka, Kerala and Lakshadweep was organized at KVK, Chikkamagaluru during 14-16, May 2019. Workshop was inaugurated by Dr.M.K.Naik, Hon'ble Vice Chancellor, University of Agriculture and Horticulture Sciences (UAHS), Shivamogga, on 14 May in the presence of Dr.M.J.Chandre Gowda, Director (Acting), ICAR-ATARI, Directors of Extension -Dr.Jiju Alex, KAU, Thrissur; Dr.N.A.Yeledhalli, UAS, Dharwad; Dr.U.S.Biradar,

KVAFSU, Bidar; and Dr.S.P.Nataraju, UAHS, Shivamogga of Karnataka. Inaugural session was presided over by Dr.Hanumanthappa, Dean, Horticulture College. In his inaugural address, Hon'ble Vice Chancellor commended the KVKs as the face of SAUs and stressed that the SAUs look towards KVKs to provide feedback on researchable issues as well as emerging problems like Fall Army Worm. He recalled the role of KVKs in helping SAUs to develop adhoc recommendations for such emerging challenges.



Dr.M.K.Naik, Hon'ble Vice Chancellor, UAHS, Shivamogga inaugurating Annual Review Workshop 2018-19

During three days, all KVKs of the zone presented the progress achieved during 2018-19 on the mandated activities as well as the impact over a period of time in the form of cases of large scale adoption and success stories. Directors of Extension chaired the technical sessions, which were co-chaired by Principal Scientists of ATARI. Experts from SAUs offered observations on the performance of technologies based on data generated through OFTs and FLDs.

On 16 May, 2019, valedictory of workshop was graced by Dr.S.Rajendra Prasad, Hon'ble Vice Chancellor, UAS, Bengaluru as Chief Guest and Dr.Randhir Singh, ADG(Agricultural Extension) as Guest of Honour. Dr.M.J.Chandre Gowda, Director (Acting), ICAR-ATARI presented a summary report highlighting the salient processes and significant

outcomes recorded during the workshop. The Hon'ble Vice Chancellor inspired the KVKs to continue the good work being done. He highlighted the support extended by UAS-B to its KVKs and assured more support. ADG (AE) echoed on the over-burdened position of KVKs, and requested the SAUs to fill-up all the existing vacancies in KVKs. He urged upon KVKs to be smart in their thinking and actions by adopting state-of-the art technologies including ICTs, micro irrigation, farm mechanization, processing and value addition, and market intelligence in reaching more farmers and stakeholders. He stressed upon efficient utilization of ICAR budget besides mobilizing external sources and judicious use of revolving fund for better performance of KVKs.



Dr.S.Rajendra Prasad, Hon'ble Vice Chancellor, UAS, Bengaluru and Dr.Randhir Singh, ADG (Agricultural Extension) released the district strategy documents prepared by KVKs for Doubling Farmers Income (DFI)

1.2.4.3 Inter-zonal review cum action plan workshop of farmer FIRST programme

The ICAR-ATARI, Bengaluru organized the review cum action plan workshop of farmer FIRST programme of Zone-XI, Bengaluru and Zone-VIII, Pune on 9 May, 2019. Inter-zonal review cum action plan workshop of farmer FIRST programme was the first of its kind among ICAR-ATARIs in the country.

Dr. M.J. Chandre Gowda, Director (Acting), ICAR-ATARI, Bengaluru emphasized the importance of review and action plan exercise in the context of cross-learning and experience-sharing. Achievements over the years should be looked for major impact points and the

intervention-specific benchmark should be the basis for interpretation. Action plan should be realistic, focusing on interventions that are problem-solving and must also maintain continuity on the impacts already initiated.

Dr. Lakhan Singh, Director, ICAR-ATARI, Pune while appreciating the initiative stressed the importance of planning, involvement of researchers in FFP activities, on-site input management, institution building, ground reality and holistic view. Planning at community level as well as village level must be an inclusive exercise wherein focus on landless, marginal and women are given equal attention.



A view of Farmer FIRST review-cum-action plan meeting at ICAR ATARI Bengaluru

Three ICAR institutes from Zone-XI viz. ICAR-CPCRI, Kasaragod; ICAR- IIHR, Bengaluru; and ICAR-NIANP, Bengaluru and three SAUs from Zone-VIII viz. MPKV, Rahuri; NAU, Navsari; and JAU, Junagadh presented the progress of farmer

FIRST programme for the year 2018-19 and action plan for the year 2019-20. Publications brought out by MPKV, Rahuri were released. The scientists from ICAR-ATARI, Bengaluru and KVK, Bengaluru Rural were also participated in the workshop.



Release of publications during inter-zonal workshop of Farmer FIRST programme

1.2.4.4 Annual action plan workshops for KVKs

Karnataka: Annual action plan workshop for KVKs of Karnataka (Zone-XI) for the year 2019-20 was organized in collaboration with Directorate of Extension, University of Agricultural Sciences, Dharwad during 25-27 April, 2019. Dr. M.B.Chetti, Hon'ble Vice-Chancellor, UAS, Dharwad, inaugurated the workshop by lighting the lamp. During his inaugural speech he said that KVKs are playing a key role in technology assessment and dissemination of newly released technologies /varieties to the farmers which will help in increasing the farmers knowledge and income . Head of KVKs in Karnataka and participating scientists were advised to prepare the action plan based on the vision document prepared by the KVKs for doubling farmers income. Every extension personnel should have three important characters like good scientific knowledge, communication skills and good relationship with the farmers. Dr. M.J. Chandre Gowda, Director (Acting), ICAR-ATARI, Bengaluru, during his introductory remarks suggested that KVK action plans should focus on the recent technologies /varieties, ways to reduce the cost of cultivation by stopping the excess use of

fertilizers, pesticides, herbicides and reduced labour cost by adopting appropriate farm mechanization.

Farmers' income can be increased by giving more emphasis on value addition and good market linkage. Dr. N.A.Yeledhalli, Director of Extension UAS, Dharwad welcomed dignitaries, scientists and experts from different SAU's and ICAR institutes. During his welcome address he requested all ICAR institutes in Karnataka to guide the KVKs to work on crop diversification, soil and water management and post harvest technologies to double the farmers income.

Dr. B. M. Chittapur, Director of Extension, Raichur; Dr. M. S. Nataraju, Director of Extension, UAS, Bengaluru; Dr. Y. K. Kotikal, Director of Extension, UHS, Bagalkot; Dr. S. P. Nataraj, Director of Extension, UAHS, Shivamogga; Dr. H.L.Nadaf, Director of Research, UAS, Dharwad were present. More than 75 participants including senior scientists & heads, experts from different SAU's, ICAR institutes of Karnataka and faculty of UAS, Dharwad participated in the workshop.



Dr. M.B.Chetti, Hon'ble Vice-Chancellor, UAS, Dharwad, inaugurating annual action plan workshop for KVKs of Karnataka

Kerala and Lakshadweep: Annual action plan workshop 2019-20 for KVKs of Kerala and Lakshadweep was held during 18-20 March, 2019 at Karshaka Bhavan, KAU, Thrissur. KVK Heads along with SMSs made presentations before the panel of subject experts from KAU, KVASU, ICAR-ATARI and scientists 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,

Kerala and Dr. D.V.S Reddy, Principal Scientist, ICAR-ATARI coordinated the workshop.

1.3 Budget

A total of Rs. 7368.03 lakh was sanctioned for the year 2019-20 as Grant in Aid for KVKs and another Rs. 592.1 lakh was sanctioned for special programmes. Head-wise details of budget are furnished in Table 3.

Table 3: Head-wise budget of Zone XI for 2019-20

Heads	Sanction			
	ATARI	KVKs	Support to DEE at SAUs	Total (Rs. Lakh)
(A) Recurring				
Pay & Allowance	223.4	5686.49	0	5909.89
T.A	13.64	77.05	51.0	95.79
HRD	0.6	0	3.2	3.8
Contingencies	96.24	612.83	20.4	729.47
Total (A)	333.88	6376.37	28.7	6738.95
(B) Non Recurring				
Works	0	588.66	0	588.66
Furniture & Equipment	2.42	22	0	24.42
Vehicle	0	16	0	16
Library	0	0	0	0
Revolving Fund	0	0	0	0
Total (B)	2.24	626.66	0	629.08
Total (A+B)	336.3	7003.03	28.7	7368.03
(C) Special Programmes				
ARYA	6.49	104.7	0	111.9
NICRA	7.25	65.8	0	73.05
NFSM	10.51	113.4	0	123.91
NMOOP	9.01	40.85	0	49.89
FFP	5.85	56.07	0	61.92
DAMU	8.59	131.26	0	139.96
Sujala - 3	5.98	26.23	0	32.21
Total C	53.68	538.42	0	592.1
Total A+B+C	389.98	7541.45	28.7	7960.13

ABOUT KRISHI VIGYAN KENDRA (KVK)

Krishi Vigyan Kendra (KVK) is the agricultural knowledge and resource centre for farmers, farmwomen, rural youth, extension functionaries and other stakeholders. These are the innovative district level institutions meant for promoting science-based practices in agriculture and allied sectors in a problem-solving mode. KVKs accomplish this through assessment, demonstration and capacity building on 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. 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-XI had the privilege of establishing the first additional KVK in India at Tumakuru district, Karnataka. With effect from April 2017, reorganization of zones was implemented and ATARI Bengaluru became Zone-XI with jurisdiction of 3 states/UTs viz., Karnataka, Kerala and Lakshadweep. There are 48 KVKs in the Zone at present. State and host organization wise distribution of KVKs 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	05	02	33
Kerala	7	03	04	14
Lakshadweep	-	-	01	01
Total	33	08	07	48

SAU - State Agricultural University; NGO - Non-Governmental Organization; ICAR - Indian Council of Agricultural Research

2.2 Vision, mission, mandate and activities of KVKs

2.2.1 Vision:

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

2.2.2 Mission:

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

2.2.3 Mandate:

Technology assessment and demonstration for its application and capacity development.

2.2.4 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 Staff strength of KVKs

The approved strength of manpower at each KVK is 16, which includes one Head of KVK at Senior Scientist level, six Scientists /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 561 (73.05%) were in position. Details of State-wise and category wise staff strength of KVKs are furnished in Table 5.

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

Category	Karnataka (33 KVKs)		Kerala (14 KVKs)		Lakshadweep (1 KVK)		Total (48 KVKs)	
	S	F	S	F	S	F	S	F
Heads of KVKs (Senior Scientist)	33	27	14	14	1	0	48	41
Subject Matter Specialists	198	159	84	67	6	1	288	227
Programme Assistants	99	74	42	24	3	0	144	98
Administrative staff	66	40	28	25	2	0	96	65
Drivers	66	47	28	22	2	0	96	69
Supporting staff	66	34	28	25	2	2	96	61
Total	528	381	224	177	16	3	768	561
Filled (%)	72.16		79.02		18.75		73.05	

S - No. of sanctioned posts; F - No. of filled posts

2.4 Infrastructure at KVKs

State wise details of infrastructure in KVKs of Zone –XI are presented in Table 6. As on December 2019, 45 KVKs have administrative building, 40 KVKs have farmers hostel, 28 KVKs have staff quarters, 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 and 44 KVKs have four-wheelers. All together there are 80 demonstration units and 94 two-wheelers in KVKs.

Table 6: State wise details of infrastructure in KVKs

Infrastructure	Infrastructure (No.)			
	Karnataka	Kerala	Lakshadweep	Total
Administrative buildings	31	14	0	45
Farmers hostels	28	12	0	40
Staff quarters	19	09	0	28
Demonstration units	49	31	0	80
Rainwater harvesting units	10	06	0	16
E-connectivity	11	10	0	21
Soil and water testing labs	24	13	01	38
Portable carp hatcheries	04	03	0	7
Minimal processing units	01	02	0	3
Plant health diagnostic labs	09	05	0	14
Four wheelers	31	13	0	44
Two wheelers	63	38	03	94

2.5 Scientific Advisory Committee

Scientific Advisory Committee (SAC) is the advisory body, which guides and reviews KVK activities every year. Head of host organization is the Chairman and members include Director of ICAR-ATARI, Director of Extension under the jurisdiction of KVK, officials from all development departments of respective district, and representatives of farmers/farmwomen from respective district. SAC discusses the progress of work done as per mandate and provide guidance for future activities. A total of 29 KVKs conducted SAC meetings during the reporting period.

2.6 Revolving fund

Revolving fund is in operation at 45 KVKs of the Zone provided by ICAR and the remaining three have revolving fund of their own. KVKs are utilizing revolving fund for production of technological products and the net balance as on 31 December, 2019 was Rs.11.98 crore. Nineteen KVKs had closing balance of more than Rs.20 lakh, nine KVKs had a balance in the range of Rs.10 to 20 lakh, eleven KVKs had closing balance in the range of Rs.4 to 10 lakh and nine KVKs had closing balance less than Rs.4 lakh.

2.7 Thrust areas

Based on the agro-ecological situation and 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, reducing cost and drudgery reduction.
- Capacity building of rural youth and women to establish self-employment units.
- Human resource development in fishery sector through training and capacity building.

ACHIEVEMENTS

3.1 Krishi Vigyan Kendras

3.1.1. Technology Assessment

On Farm Testing (OFT) is an important mandate of Krishi Vigyan Kendra (KVK) and the details of OFTs carried out by KVKs in Zone-XI during 2019 are presented under this head. KVKs conducted 199 OFTs under crops, 28 OFTs under livestock and eight OFTs under Home Science categories. Details of thematic areas covered under each category and brief results are presented below.

3.1.1.1 Crops

KVKs in the zone conducted a total of 199 OFTs during the year which are spread over 13 different thematic areas. It included 141 OFTs in Karnataka and 58 in Kerala. The maximum number of OFTs were taken up on varietal evaluation (93), followed by integrated pest management (26). Altogether, 464 technological options were assessed by laying out 829 trials. Among the different themes, varietal evaluation was the major theme wherein 214 technologies were assessed through 366 trials. Under Integrated Pest Management, a total of 67 technologies were assessed through 111 trials, followed by 48 technologies assessed on Integrated Nutrient Management through 86 trials (Table 7).

Table 7: Thematic area wise technology assessment on crops by KVKs in Zone-XI

Thematic areas	Technology assessment on crops								
	OFTs (No.)			Technologies (No.)			Trials (No.)		
	Karnataka	Kerala	Total	Karnataka	Kerala	Total	Karnataka	Kerala	Total
Cropping system	8	0	8	20	0	20	29	0	29
Drudgery reduction	1	0	1	2	0	2	5	0	5
Farm mechanization	3	5	8	6	10	16	11	18	29
Integrated Crop Management	5	3	8	9	6	15	21	9	30
Integrated Disease Management	14	4	18	34	8	42	44	20	64
Integrated Nutrient Management	11	19	20	24	24	48	40	46	86
Integrated Pest anagement	16	10	26	39	28	67	58	53	111
Resource conservation echnology	8	4	12	21	8	29	37	32	69
Seed / Plant production	0	1	1	0	2	2	0	2	2
Storage technique	1	0	1	3	0	3	3	0	3
Value addition	0	2	2	0	4	4	0	30	30
Varietal evaluation	73	20	93	166	48	214	274	92	366
Weed management	1	0	1	2	0	2	5	0	5
Total	141	58	199	326	138	464	527	302	829

(a) Crop wise OFTs

Details of OFTs taken up under different crops are presented in Table 8 and data indicate that maximum OFTs were taken up on vegetable crops in both the states. In Karnataka, more OFTs were taken up on pulses and commercial crops, whereas in Kerala, it was on cereal (mostly paddy) and plantation crops.

Table 8: Break-up of OFTs taken up by KVKs under different crops

Crop category	OFTs (No.)		
	Karnataka	Kerala	Total
Cereals	13	9	22
Oilseeds	13	2	15
Pulses	25	1	26
Commercial	21	4	25
Vegetables	44	20	64
Fruits	5	7	12
Flowers	4	1	5
Plantations	12	9	21
Tubers	4	5	9
Total	141	58	199

(b) Management of YMV in pole beans

Approaches to manage yellow mosaic virus in pole beans was assessed in four locations viz.,

Bengaluru Rural, Chikballapur, Kolar and Mandya. The technological option from ICAR-IIVR, Varanasi i.e. Seed treatment with Thiomethaxam 25 WG – 5g/kg seeds, mulching with black silver sheet, intercropping with two rows of border crops of maize, soil application of *Pseudomonas fluorescens* along with neem cake, installation of yellow sticky trap @ 10 no/acre, spraying of neem soap (5g/l), salicylic acid 2mM, seaweed extract (1.5ml/l), Entomopathogenic fungus *Beauveria bassiana* (2ml/l), Thiamethoxam 25% WG (0.5 g/l) and Imidacloprid 17.8 SL (0.5ml/l) performed better with yield up to 32.21 t/ha. Cost of plant protection reduced to Rs.7680/ha from Rs.18575/ha in farmers practice. YMV incidence was less than 5 % as compared to 28% in farmers practice.



OFT on polebeans at Bengaluru Rural and Kolar districts of Karnataka

(c) Root grub management in sugarcane

In Karnataka, Belagavi and Mysuru districts of Karnataka tested biological management of root grub in sugarcane. In Belagavi, *Metarhizium anisopliae*, EPN and *Beveria* were tested against farmers practice. Number of grubs reduced from 7.80 to 1.40 per 10 m row and the yield increased from 93.00 t/ha to 106.00 t/ha. In Mysuru,

Entamo Pathogenic Nematode (EPN-*Heterorhabditis indica*) was tested against the chemicals - Chlorpyrifos @ 4 ml/l per sqmt, and drenching of Imidacloprid 40WG+Fipronil 40WG (150g/400lt @ planting). EPN was as effective as drenching of chemicals (grub incidence reduced by 50 % from 11.80 to 6.40), and was better than farmers practice.

(d) Composting

Different compost cultures were assessed for time taken and quality parameters. Sugarcane trash and silkworm rearing waste were composted using different cultures individually and in combination with rock phosphate and cow dung slurry. ICAR-IIHR decomposer culture and CSRTI culture with rock phosphate were able to achieve desired composting in 90 days. NCOF culture was effective at higher dose of culture solution (200 l per ton of material).

(e) Varietal evaluation

(i) Okra

Arka Nikhita hybrid of okra performed better at both KVKs of Dharwad and Koppal with yield up to 200.00 q/ha. CoBH-4 also performed better with yield of 190.00 q/ha at KVK, Koppal (Table 9).

Table 9: Performance of okra hybrids under OFTs conducted by KVKs

Name of KVK	Farming situation	Okra hybrids assessed	Yield (q/ha)	Gross return (Rs. /ha)	BCR
Koppal	Irrigated	Hybrid	179.00	233412	4.44
		CoBH - 4	190.00	265195	5.03
		Arka Nikhita	197.00	282847	5.22
Dharwad	Protective irrigation	Local variety	143.00	116600	3.12
		Arka Nikitha	200.00	232300	4.40
		Arka Anamika	174.00	177934	3.72



OFT on okra at Koppal district of Karnataka

(ii) Chickpea

Seven varieties of chickpea were tested in different locations with different combinations as detailed in Table 10. Varieties viz., JAKI-9218, NBeG-3, BGD 103, NBeG-47, GBM-2, BGD-111-01, and JG-14 were tested against the farmers practice of JG-11 in rainfed, with protective irrigation and irrigated

conditions. Highest yield was obtained under irrigated conditions with JG 14 (18.58 q/ha), BGD-111-01 performed better with yield of 16.52 q/ha under protective irrigation and NBeG-3 and BGD-103 varieties performed better with yield of 16 q/ha under rainfed.

Table 10: Performance of chickpea varieties under OFTs conducted by KVKs

Name of KVK	Farming situation	Chickpea varieties assessed	Yield (q/ha)	Gross return (Rs. /ha)	BCR
Belagavi-II	Rainfed	JG-11	14.70	55944	2.40
		JAKI-9218	13.70	51997	2.20
		NBeG-3	16.00	60694	2.60
Ballari	Rainfed	BJG-11	14.00	56000	2.80
		BGD 103	16.00	64000	3.20
		NBeG-47	14.50	58000	2.90
Dharwad	Protective irrigation	JG-11	14.93	41653	2.54
		JAKI-9218	15.63	44873	2.66
		GBM-2	13.47	33907	2.21
Gadag	Protective irrigation	JG-11	11.95	28097	2.08
		JAKI-9218	13.57	35038	2.33
		BGD-111-01	16.52	47521	2.75
		NBeG-3	15.30	42225	2.57
Bagalkot	Irrigated	JG-11	13.50	24775	1.85
		JAKI-9218	16.33	36108	2.24
		JG-14	18.58	45108	2.54



OFT on chickpea at Ballari and Gadag districts of Karnataka

(iii) Chilli

Arka Kyathi hybrid of chilli performed better in both the locations at KVK, Tumakuru-I and KVK,

Vijayapura-II during 2019 with the best yield of 262.00 q/ha and 324.20 q/ha, respectively (Table 11).

Table 11: Performance of chilli varieties under OFTs conducted by KVKs

Name of KVK	Farming situation	Chilli varieties assessed	Yield (q/ha)	Gross return (Rs. /ha)	BCR
Tumakuru-I	Irrigated	Ulka	224.00	116300	2.21
		Arka Kyathi	262.00	168100	2.82
		DC 1007	249.50	153700	2.90
Vijayapura-II	Irrigated	Jwala	265.00	291316	1.77
		Arka Meghana	290.80	349000	2.40
		Arka Kyathi	324.20	405208	2.78

(iv) Groundnut

Different varieties of groundnut were tested by six KVKs viz. Dharwad and Tumakuru-II under rainfed situations and Belagavi-II, Haveri, Yadgir and Vijayapura-II under irrigated situations. Due to very good rainfall throughout the cropping season at KVK, Dharwad, best yields were recorded with JL-1085

variety (24.60 q/ha). Under deficit rainfall situations, DGRMB-24 exhibited drought tolerance with yield up to 12.35 q/ha at KVK, Tumakuru-II. Under irrigated situations, JL-1064 performed better with yield of 23.17 q/ha at KVK, Haveri (Table 12).

Table 12: Performance of groundnut varieties under OFTs conducted by KVKs

Name of KVK	Farming situation	Groundnut varieties assessed	Yield (q/ha)	Gross return (Rs. /ha)	BCR
Dharwad	Rainfed	JL-24	18.50	69525	2.71
		GPBD-4	22.50	93325	3.3
		JL-1085	24.60	105820	3.61
Tumakuru-II	Rainfed	K-6	8.44	42960	1.91
		DGRMB-24	12.35	62862	2.72
		DGRMB-32	11.13	56652	2.52
		TG37A	9.75	49628	2.23
Belgaum-1	Irrigated	Dhanalaxmi	17.27	82896	2.91
		TGLPS-3	18.79	90192	3.88
		ICGV-06189	23.93	114864	4.17
Haveri	Irrigated	Local	17.17	84117	2.67
		G-2-52	22.67	111067	2.94
		JL-1064	23.17	113517	3.01
Yadgir	Irrigated	G-2-52	23.10	47660	3.84
		GPBD-4	20.38	40575	3.27
		TMV-2	17.38	33175	2.76
Vijayapura-II	Irrigated	G-2-52	17.86	53426	2.23
		K-9	16.03	44106	2.12
		GKVK-5	15.24	39928	2.02



OFT on groundnut at Tumakuru and Dharwad districts of Karnataka

Technology assessment on livestock

3.1.1.2 Under livestock sector, 28 OFTs were taken up out of which 16 are by KVKs of Karnataka and 12 by KVKs of Kerala. These OFTs were mostly on cattle (13), followed by poultry (10). Evaluation of

breeds was the major theme (12 OFTs) which was used to assess 26 technological options through 38 trials. Feed and fodder related OFTs were taken up to assess 20 technological options laid out in 45 trials (Table 13).

Table 13: Details of OFTs on livestock conducted by KVKs in Zone - XI

Thematic areas	OFTs (No.)				Technologies (No.)	Trials (No.)
	Cattle	Poultry	Fisheries	Total		
Zonal level						
Evaluation of breeds	0	7	5	12	26	38
Nutrition management	2	0	0	2	2	10
Disease of management	1	0	0	1	2	2
Production and management	2	2	0	4	6	9
Feed and fodder	8	0	0	8	20	45
Drudgery reduction	0	1	0	1	1	3
Zone total	13	10	5	28	57	107
KARNATAKA						
Evaluation of breeds	0	4	3	7	17	24
Nutrition management	2	0	0	2	2	10
Disease of management	1	0	0	1	2	2
Production and management	1	0	0	1	2	3
Feed and fodder	5	0	0	5	16	30
Karnataka total	9	4	3	16	39	69
KERALA						
Evaluation of breeds	0	3	2	5	9	14
Production and management	1	2	0	3	4	6
Feed and fodder	3	0	0	3	4	15
Drudgery reduction	0	1	0	3	4	3
Kerala total	4	6	2	12	18	38

(a) Fodder varieties

Different fodder varieties/species were tested by four KVKs viz., Ballari, Vijayapura-II and Yadgir in Karnataka and Wynad in Kerala. Among the tested varieties, Super Napier yielded 4050 q/ha at KVK,

Ballari in Karnataka, which was almost the double that of the next best yield of 2100 q/ha recorded with Co-5 Hybrid Napier at KVK, Wynad in Kerala.

Table 14: Fodder varieties assessed under OFTs by KVKs in Zone-XI

Name of KVK	Fodder varieties assessed	Yield (q/ha/Year)	Gross return (Rs. /ha)	BCR
Ballari	NB -21	1333	199995	5.69
	Co-3	1567	235005	6.69
	Super Napier	4050	607500	8.77
Vijayapura-II	Napier	1380	21600	3.60
	Co-5	1815	29300	4.19
	DHN-6	1510	23200	3.31
Yadgir	SSV-74	790	44250	4.42
	COFS-29	1420	75600	4.15
	COFS-31	1660	96800	4.60
Wynad	Co-3	1850	370000	2.24
	Suguna	1940	388000	2.35
	Co-5	2100	255000	2.54

(b) Feed

Urea-treated dry roughages, green fodders and compounded animal feeds as per the NRC specifications + 1-2 kg grain mixture at the time of feeding urea-treated dry roughages gave the best results with a BCR of 2.08 at KVK, Davanagere

followed by balanced feed prepared by using locally available ingredients (replacing 10% GNC with Karanj cake) 3 kg + 15 kg green fodder + 4-5 kg dry fodder per day with BCR of 1.88 at KVK, Belagavi-II.

Table 15: Feed formulations assessed under OFTs by KVKs in Zone-XI

Name of KVK	Title of OFT	Feed formulations assessed	Milk yield	Unit	Gross return Rs. / unit	BCR
Belagavi -II	Assessment of different concentrate feed formulations in cross bred cows during peak production.	Assessment of different concentrate feed formulations in cross bred cows during peak production.	7.38	l/day/cow	31677	1.20
		Concentrate feed 3 kg + 15 kg green fodder + 4-5 kg dry fodder per day	7.88	l/day/cow	40290	1.68
		Balanced feed prepared by using locally available ingredients (replacing 10% GNC with Karanj cake) 3 kg + 15 kg green fodder + 4-5 kg dry fodder per day	8.52	l/day/cow	45000	1.88
Davanagere	Effect of feeding urea treated paddy straw along with grain mixture in dairy animals	Farmers practice: Dry roughages and non-leguminous green fodders along with cake and bran items	1955.4	1 / lactation	48885	1.31
		Urea-treated dry roughages, green fodders and compounded animal feeds as per the NRC specifications	2577.6	1 / lactation	64440	1.86
		Urea-treated dry roughages, green fodders and compounded animal feeds as per the NRC specifications + 1-2 kg grain mixture at the time of feeding urea-treated dry roughages	2647.6	1 / lactation	66190	2.08

3.1.1.3 Technology assessment under Home Science

Eight KVKs carried out testing of technological options under Home Science category which included (i) Assessment of methods for nutritional adequacy in agro based farming

systems by 4 KVKs, and (ii) Assessment of vitamin C supplementation foods for children by 2 KVKs. Altogether, 8 OFTs were conducted with 17 technological options through 115 trials.

3.1.2 Frontline Demonstrations (FLDs)

Frontline demonstrations on field crops, horticulture crops, livestock and fisheries, farm implements and other allied enterprises were taken up to demonstrate the production potential of newly released crop varieties, natural resource conservation technologies, crop production and protection technologies, improved technologies in livestock and fisheries and other income generating activities. A total of 3641 frontline demonstrations were conducted including 900 on cereals and millets, 61 on oilseeds, 320 on pulses, 127

on commercial crops, 35 on fibre crops, 157 on fodder crops, 454 on vegetable crops, 45 on tuber crops, 177 on fruit crops, 50 on flower crops, 75 on plantation crops, 95 on spice and medicinal crops, 356 on hybrids of various crops, besides 60 demonstrations on agricultural farm implements, 552 demonstrations on livestock, 63 demonstrations on fisheries and 114 demonstrations on enterprises covering the states of Karnataka and Kerala (Table 16).

Table 16: State-wise frontline demonstrations conducted by KVKs in Zone-XIa

Crop category	Karnataka		Kerala		Total	
	Demo (No.)	Area (ha)	Demo (No.)	Area (ha)	Demo (No.)	Area (ha)
Cereals and millets	802	311.00	98	37.70	900	348.70
Oilseeds	61	24.40	-	-	61	24.40
Pulses	313	127.20	7	0.14	320	127.34
Commercial crops	127	42.00	-	-	127	42.00
Fibre crops	35	14.00	-	-	35	14.00
Fodder crops	147	41.10	10	0.20	157	41.30
Vegetables	327	69.53	127	6.54	454	76.07
Tubers	20	6.00	25	4.03	45	10.03
Fruits	129	42.51	48	6.11	177	48.62
Flowers	10	0.08	40	12.00	50	12.08
Plantation crops	50	6.00	25	8.30	75	24.30
Spices and medicinal plants	40	4.90	55	4.38	95	9.28
Hybrids	341	121.80	15	0.82	356	122.62
Farm implements	50	8.00	10	0.80	60	8.80
Livestock	235	-	317	-	552	-
Fisheries	33	-	30	-	63	-
Enterprises	109	-	5	-	114	-
Total	2829	517.52	812	81.02	3641	909.54

3.1.2.1 Cereals and millets

A total of 890 demonstrations were conducted in various cereals and millets covering an area of 344.70 ha during the year by the KVKs in Zone-XI. The state wise break up includes 792 in Karnataka and 98 in Kerala. The state wise results are presented in the foregoing discussions.

Karnataka

A total of 242 demonstrations in paddy, 35 in wheat, 100 in maize, 69 in *rabi* jowar, 165 in finger millet, 30 in little millet, 126 in foxtail millet, 10 in kodo millet and 5 in proso millet, 10 in barnyard millet and 10 in small

millet crops were conducted covering an area of 311.00 ha in the farmers' fields during the year 2019 (Table 17). In paddy, technologies such as ICM, IPDM, INM, IDM, improved varieties viz. GNV-10-90, Gangavathi Sona and KKP-5, salt tolerant variety GGV-05-01 and eco-friendly pest management gave 5.05% to 18.61% increase in grain yield over their respective check. BCR was higher with adoption of resource management technology (3.42) and salt tolerant variety (3.29) besides higher net returns.

The highest yield of 84.87 q/ha was recorded with GNV-05-01 variety and lowest was 19.80 q/ha under resource conservation technology of Jyothi variety as upland cultivation. In wheat, an average of 35.20 q/ha grain yield was recorded under ICM by UAS-446 as compared to 31.50 q/ha in check. The improved wheat variety DDK-1029 has recorded 31.50 q/ha and with ICM, it yielded 36.20 q/ha under demonstrations with higher BCR as compared to their check. IPDM in maize gave an increase of 13.48% in yield as compared to check. In rabi jowar, ICM, improved varieties, SPV-2217 and GS-23 and fall armyworm management technologies gave an average of 13.32 q/ha as compared to check with 11.08 q/ha. Varietal demonstration in finger millet with KMR 204, KMR-360, ML-365, KMR-340 and KMR-204 and

finger millet-cowpea double cropping gave an average yield of 23.84 q/ha under demonstrations as compared to 20.08 q/ha in check. The average BCR of 1.85 was obtained with varietal introduction and production technologies with an average yield of 10.33 q/ha in little millet. Intercropping system with pigeonpea + foxtailmillet (1:2) gave higher net returns of ₹. 60671/ha as compared to check (14995/ha). Kodo millet variety RK 390-25 has recorded 7.2q/ha which is 30.55% higher yield than check. Similarly proso millet under crop production gave 11.50 q/ha, DHBM 93-3 variety of barnyard millet 12.43 q/ha and small millet variety Poshitha as contingent crop 2.85 q/ha.

Table 17: Frontline demonstrations conducted on cereals and millets by the KVKs of Karnataka

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Paddy	ICM	8	KPR-1, MGD-03, JGL-Sona, PSB-68, MO-4, Kaveri Sona, Abhilash, Paustic-9	71	31.00	48.01	40.12	18.61	46210	2.14	29227	1.71
	Variety demonstration	1	Gangavathi Sona	14	4.00	47.99	45.68	5.05	57330	2.48	45529	2.22
	Variety demonstration	2	GNV-10-90	15	6.00	74.89	65.40	18.21	78829	2.83	60015	2.17
	Variety demonstration	1	KKP-5	10	4.00	73.35	62.58	17.20	86395	2.59	67675	2.34
	Salt tolerant variety	1	GGV-05-01	10	4.00	84.87	72.28	17.43	83923	3.29	68936	2.43
	INM	3	JGL-1798, MO-4, Gangavati Sona	15	6.00	49.35	43.50	14.16	41669	2.06	33881	1.91
	Resource management technology	5	RNR-150-48, BPT-5204, Mo-4, Kaveri Sona	52	21.00	53.76	50.77	6.47	80488	3.42	63937	2.41
	Resources conservation technology (upland)	1	Jyothi	10	4.00	19.80	18.50	7.00	70800	2.99	51313	2.07
	IDM	2	BPT-5204	10	4.00	68.35	62.00	8.98	64858	2.21	55198	2.05
	IPDM	5	JGL-1798, Jyothi, BR-2655, KPR-1, RP Bio-226	30	12.00	55.04	50.68	10.49	56678	2.32	44388	1.96
	Eco-friendly pest management	1	MO-4 & Kajejaya	5	2.00	51.00	44.00	15.90	61502	2.97	50756	2.55
	Total/Average				242	98.00	56.95	50.50	12.68	66244	2.66	51896

Wheat	ICM	1	UAS-446	10	4.00	35.20	30.80	14.30	32672	2.07	17245	1.49
	ICM	1	DDK-1029	15	4.00	36.20	29.40	23.20	52483	3.10	38898	2.60
	Varietal introduction	1	DDK-1029	10	4.00	31.50	28.30	11.31	24675	2.10	19875	1.90
	Total/Average			35	12.00	34.30	29.50	16.27	36610	2.42	25339	2.00
Maize	INM	1	Local	10	4.00	26.55	22.00	17.14	28790	2.52	21600	2.20
	IPDM	2	Dekalb -9141	30	11.00	71.07	61.54	13.48	79583	3.12	56946	2.20
	Intercropping(Maize+Pigeonpea)	2	TS-3R + BRG-5	50	20.00	40.45	30.40	28.77	33337	1.84	19192	1.53
	Invasive pest management (Fall army worm)	1	Local	10	4.00	51.25	47.50	7.89	68625	3.38	55909	2.57
Total/Average			100	39.00	47.33	40.36	16.82	52584	2.71	38412	2.12	
Rabi Sorghum	ICM	3	SPV-2217	34	13.60	16.58	14.61	13.47	27408	2.48	21708	2.26
	Varietal evaluation	1	SPV-2217	20	8.00	6.55	5.11	28.18	7140	1.44	4124	1.27
	High yielding variety	1	GS-23	10	4.00	14.75	12.50	15.25	34125	2.95	26250	2.50
	Fall armyworm management	1	M 35-1	5	2.00	15.40	12.10	21.43	28962	1.92	17064	1.50
Total/Average			69	27.60	13.32	11.08	19.58	24409	2.20	17287	1.88	
Finger millet	ICM	5	ML-365	80	32.00	26.22	20.47	26.85	33768	1.91	26391	1.70
	Short duration variety	3	KMR - 630	25	8.00	26.38	22.06	22.03	45166	2.43	34052	2.12
	Double cropping finger millet-cowpea	1	ML-365, Cow pea - IT 38956-1	20	8.00	20.50	17.30	18.50	61561	2.03	30459	1.80
	Introduction of variety	1	ML – 365	25	10.00	21.50	16.50	30.30	38850	2.65	23350	2.12
	Variety demonstration	1	KMR-340	10	2.00	18.90	17.50	18.08	32575	2.41	32135	1.85
	Variety demonstration	1	KMR-204	5	2.00	29.56	26.67	10.8	41856	2.19	36342	2.10
Total/Average			165	62.00	23.84	20.08	21.09	42296	2.27	30455	1.95	
Little millet	Crop production	2	DHLM-36-3	15	6.00	9.94	4.50	35.71	11204	1.66	2500	1.18
	Variety demonstration	1	OLM- 203	10	4.00	9.95	7.68	29.58	13373	1.41	9170	1.08
	Variety introduction	1	DHL36-3	5	2.00	11.10	8.80	26.10	16609	2.49	11540	2.09
Total/Average			30	12.00	10.33	6.99	30.46	13729	1.85	7737	1.45	
Foxtail millet	Crop production	4	DHFT 109-3, HN-6, HMT-100-1	50	20.00	9.58	6.42	27.29	15807	3.00	10617	1.63
	Varietal introduction	2	DHFT-109-3	30	8.00	16.20	12.57	33.65	30260	4.08	20920	2.85
	Varietal demonstration	3	HN-46	26	10.40	20.70	15.50	19.89	40141	3.27	28226	3.02
	Intercropping- Pigeonpeae+ foxtail millet (1:2)	2	DHLM-36-3 & TS 3R	20	8.00	29.36	11.05	164.50	60671	4.07	14995	1.88
Total/Average			126	46.40	18.96	11.39	61.33	36720	3.50	18689	2.34	
Kodo millet	ICM and value addition	1	RK-390-25	10	4.00	7.20	5.00	30.55	11100	2.00	5700	1.61
Proso millet	Crop production	1	DHPM-2769	5	2.00	11.50	-	-	15223	1.73	-	-
Barnyard millet	ICM	1	DHBM-93-3	10	4.00	12.43	10.48	18.62	24175	2.85	18700	2.47
Small millet	Contingent crop	1	Poshita	10	4.00	2.85	-	-	24025	2.28	-	-
Grand total				802	311.00							



FLD on paddy variety GNV 10-89 by KVK Raichur



FLD on ICM in wheat by KVK, Dharwad



FLD on foxtailmillet by KVK Koppal

Kerala

A total of 98 demonstrations on paddy covering an area of 37.70 ha were conducted during the year (Table 18). The technologies such as ICM, resource conservation, INM, IWM, IPDM, IDM, organic cultivation and varietal demonstration viz., Pournami and Akshaya gave an average 54.97 q/ha yield as compared to check

(43.72 q/ha). The highest yield was recorded in Akshaya variety 70.00 q/ha followed by uma with weed management with (68.75 q/ha) and jyothi with bio intensive pest and disease management (62.85 q/ha). New varieties Pournami and Akshaya recorded 42.30% and 27.00% increased yield respectively as compared to their checks.

Table 18: Frontline demonstrations on cereals conducted by KVKs of Kerala

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Paddy	Crop production	1	Manuratna	10	4.00	55.00	35.00	57.00	47000	1.40	44500	0.63
	Resource conservation technology	1	Uma	10	5.00	28.05	28.05	0.00	32615	1.75	19865	1.35
	IPDM	1	Matta Thriveni	10	2.50	47.75	31.69	33.63	89690	2.54	43925	1.80
	IDM	1	Sreyas, Mahamaya, Jyothi	15	6.00	50.80	40.80	24.50	79068	2.38	55918	2.04
	Bio intensive pest and disease management	1	Jyothi	5	2.00	62.85	47.30	32.80	57232	1.71	25161	1.32
	INM	2	Shreyas	10	7.00	52.50	41.50	20.50	136929	2.16	100578	1.90
	Weed management	1	Uma	20	4.00	68.75	63.80	7.75	97537	2.27	82914	2.05
	Organic cultivation	1	Manuratna (KAU)	3	1.20	55.00	50.00	10.00	68000	2.06	50000	1.71
	Demonstration of variety	1	Pournami (MO-23)	10	4.00	59.00	48.00	42.30	90300	2.06	64600	1.70
	Varietal Demonstration	1	Akshaya	5	2.00	70.00	51.10	27.00	119000	2.83	86870	2.13
Total/Average				98	37.70	54.97	43.72	25.5	147096	2.12	77333	1.67



FLD on paddy variety Akshaya by KVK Idukki

3.1.2.2 Oilseeds

During the year 51 demonstrations were conducted by KVKs of Karnataka covering groundnut, linseed and sesamum in 20.40 ha area in farmers' fields. The crop-wise results are presented in the forgoing discussion.

Karnataka

During the year, total demonstrations of 35 in groundnut, 10 in linseed and 16 in sesamum were conducted by KVKs of Karnataka under oilseeds in an area of 20.4 ha in farmers' fields (Table19). The groundnut crop performed better under Integrated Pest

and Disease Management (GPBD-4 and TMV-2) as compared to check. The highest yield of 25.10 q/ha was recorded by

variety GPBD-4, which is 14.36% higher than check (22.00 q/ha). This was followed by 22.30 q/ha under IPDM demonstrations in groundnut. Sesame variety E8 under ICM recorded higher yield of 7.50 q/ha as compared to check (6.50 q/ha). Linseed variety NL-115 recorded an average yield of 6.50 q/ha, which is 23.80% higher as compared to check (5.25 q/ha).

Table 19: Frontline demonstration on oilseeds conducted by KVKs of Karnataka

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Groundnut	ICM	2	TMV-2, G2-52	15	6.00	15.05	12.20	23.42	42342	2.74	31449	2.39
	IPDM	1	TMV-2	10	4.00	22.30	18.42	17.39	44320	1.91	30314	1.65
	IPM	1	GPBD-4	5	2.00	25.10	22.00	14.36	112919	5.49	94636	4.60
	Varietal demonstration	1	KCG 6	5	2.00	14.10	11.22	25.00	9940	1.22	49460	2.00
	Total/Average			35	14.00	19.14	15.96	20.04	52380	2.84	51465	2.66
Linseed	Varietal introduction	1	NL-115	10	4.00	6.50	5.25	23.80	16750	2.21	13175	2.14
Sesamum	ICM	1	E8	6	2.40	7.50	6.50	24.60	30530	3.68	35890	3.87
	Varietal introduction	1	GT-01	10	4.00	1.31	0.96	36.00	-4225	0.72	-6133	0.56
	Total/Average			16	6.40	4.41	3.73	30.30	13153	2.20	14879	2.22
Grand total				61	24.40							



FLD on ICM in groundnut by KVK Chitradurga

3.1.2.3 Pulses

A total of 313 demonstrations were undertaken on major pulses in 127.20 ha area of farmers' fields by KVKs in Zone-XI. The state wise and technology wise results are presented below.

Karnataka

A total demonstrations of 148 in pigeonpea, 53 in greengram, 11 in blackgram, 5 in horsegram, 20 in cowpea, 35 in chickpea and 41 in soyabean were organized by KVKs of Karnataka covering an area of 16.41 ha (Table 20).

The technologies such as ICM, IDM, INM, IPM, intercropping and weed management were demonstrated in pigeonpea. Among these technologies, intercropping of pigeonpea with maize has recorded highest yield of 33.80 q/ha, which was followed by 17.36 q/ha under Integrated Nutrient Management. In greengram, improved variety BGS-9 gave highest yield of 9.50 q/ha as compared to 6.37 q/ha in check. In blackgram, overall yield increase due

to ICM and INM was 38.55% over check, wherein ICM recorded 14.81 q/ha and INM gave 10.62 q/ha. Varietal demonstration in horsegram recorded 5.54 q/ha over check as a contingent crop for late sowing. The double cropping demonstration in cowpea has recorded 32.50 q/ha with BCR of 2.44. During *rabi* season, varietal demonstration and IPM in chickpea gave an average increase of 20.64 % and 20.19% in yield over their checks, respectively. The highest yield of 20.75 q/ha was recorded in varietal demonstration of JAKI -9218 followed by 16.35 q/ha in IPDM technology. Overall average yield of 14.18 q/ha was recorded in chickpea under demonstrations as against 11.91 q/ha in check. In soybean, bio-intensification (soyabean+ pigeonpea) recorded higher (CEY) yield of 52.20 q/ha followed by varietal introduction with DSb-23 (22.40 q/ha) with high economic returns.

Table 20: Frontline demonstrations on pulses conducted by KVKs of Karnataka

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Pigeonpea	ICM	5	BRG-1, GRG-152, TS-3R	98	44.00	10.72	8.75	15.73	18631	2.22	12200	2.04
	Intercropping with maize	1	BRG-3, KBC-9	10	2.00	33.80*	26.40	31.50	53150	2.77	39900	2.55
	IDM	1	GRG-811	5	2.00	16.42	11.89	38.10	72736	4.23	49462	3.54
	INM	1	GRG-811	5	2.00	17.36	12.68	36.91	66862	3.86	43826	2.98
	IPM	1	TS-3R	5	2.00	13.97	11.03	26.65	51186	2.57	26134	1.65
	Nipping	1	TS-3R	10	4.00	13.60	10.50	29.52	67760	4.08	48300	3.30
	Transplanting technique	1	BSMR-736	5	2.00	13.80	10.40	32.69	170500	5.67	121500	3.52
	Weed management	1	TS-3R	10	4.00	11.60	10.20	13.72	55560	3.64	48320	3.54
	Total/Average			148	62.00	16.41	12.73	28.10	69548	3.60	48705	2.89
Greengram	ICM	3	KKM 3	36	14.40	6.89	5.17	50.94	19127	1.41	10889	1.07
	Improved variety	1	BGS-9	12	5.00	9.50	6.37	49.10	29750	2.29	14938	1.09
	Variety demonstration	1	KKM-3	5	2.00	4.80	3.90	23.10	12676	2.10	8998	1.84
				53	21.40	7.06	5.15	41.05	20518	1.93	11608	1.33
Blackgram	INM	1	DU-1	5	2.00	10.62	7.50	41.60	34654	1.95	17750	1.55
	ICM	1	DU-1	6	2.40	14.81	10.93	35.49	65984	5.26	44891	3.94
	Total/Average			11	4.40	12.72	9.22	38.55	50319	3.61	31321	2.75

Horsegram	Variety demonstration	1	CRIDA-18	5	1.00	5.54	4.18	32.53	2680	1.47	5520	1.99
Cowpea	Variety introduction	1	DC-15	10	4.00	18.75	13.00	44.23	40200	2.30	18350	2.30
	Double cropping (Cowpea-Finger millet)	1	Cowpea KBC-9 Finger millet KMR 630	10	4.00	32.50*	24.80	31.00	73000	2.44	44600	2.31
	Total/Average			20	8.00	25.63	18.90	37.62	56600	2.37	31475	2.31
Chickpea	ICM	1	JAKI-9218	10	4.00	7.40	6.18	16.50	19580	2.24	14550	1.96
	Varietal demonstration	1	JAKI-9218	5	2.00	20.75	17.20	20.64	62021	2.96	48682	2.68
	IPM	1	BGD-103	10	4.00	12.20	10.15	20.19	37040	3.61	26680	2.67
	IPDM	1	BGD-103	10	4.00	16.35	14.12	12.71	35010	2.30	28336	2.12
	Total/Average			35	14.00	14.18	11.91	17.51	38413	2.78	29562	2.36
Soybean	ICM	1	Dsb-21	5	2.00	17.50	13.00	34.62	48650	3.11	33800	2.73
	Variety demonstration	1	Dsb-21	6	2.40	14.10	12.50	12.80	34550	3.06	30175	2.50
	Varietal introduction	1	DSb-23	10	4.00	22.40	18.64	20.16	54608	2.79	39207	2.24
	IPDM	1	JS-335	10	4.00	11.70	8.80	32.90	22431	1.83	9802	1.36
	Bio-intensification (Soybean+Pigeonpea)	1	JS-9305 + TS-3R	10	4.00	52.20	39.20	33.16	114580	3.15	51766	2.65
	Total/Average			41	16.40	23.58	18.43	26.73	54964	2.79	32950	2.30
Grand total				313	127.20							

*Crop equivalent yield of pigeonpea



IPDM in soybean by KVK Belagavi-II



FLD on greengram by KVK Chitradurga

Kerala

A total of 7 demonstrations were conducted in blackgram during the year by one KVK of Kerala (Table 21). Micro irrigation technique in blackgram recorded a yield of

5.54 q/ha with BCR of 1.47 and high economic returns of ₹. 20835/ha as compared to 3.74 q/ha with 1.35 BCR and economic returns of ₹. 10435/ha under check.

Table 21: Frontline demonstrations on pulses conducted in the state of Kerala

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Blackgram	Micro irrigation technique	1	VBN-8	7	0.14	5.54	3.74	32.49	20835	1.47	10435	1.35

3.1.2.4 Commercial crops

A total of 127 demonstrations were organized on major commercial crops covering an area of 42.00 ha during the year by the KVKs of Karnataka. Technology wise results are presented below:

Karnataka

Demonstrations conducted in commercial crops like sugarcane and mulberry are presented in Table 22. In sugarcane, technologies like ICM, IPM and green

manuring demonstrated in the farmers' field have recorded an average yield of 13060.3q/ha and BCR of 3.65 as compared to only 984.10 q/ha cane yield and BCR of 2.63 under check. In mulberry, the results revealed that mulberry leaf yield increased by 11.31% due to INM and water management technologies in V-1 variety as compared to check. The net return and BCR were ₹. 54315/ha and 2.13, respectively.

Table 22: Frontline demonstrations on commercial crops conducted by KVKs of Karnataka

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Sugarcane	ICM	1	VCF517	10	4.00	1900.00	1170.00	62.40	177390	2.89	71700	1.83
	Green manuring	1		5	2.00	1550.00	1370.00	26.60	305000	5.37	205000	3.90
	IPM	5	Co-86032	75	20.00	468.90	412.20	29.13	53089	2.70	37504	2.15
	Total/Average			90	26.00	1306.30	984.10	39.00	178493	3.65	104735	2.63
Mulberry	INM	4	V-1	35	12.00	126.71	109.46	14.45	98537	3.58	73100	2.96
	Water management	1	V1	2	4.00	4015.00	37.12	8.16	10093	0.67	9200	0.65
	Total/Average			37	16.00	2070.86	1910.73	11.31	54315	2.13	41150	1.81
Total				127	42.00							



INM in mulberry by KVK, Chikkaballapura

3.1.2.5 Fibre crops

During the year, 35 demonstrations on cotton were organized by three KVKs in Karnataka covering 14 ha area. Technology wise results are discussed below:

Karnataka

Ten demonstrations on crop production technology, five on varietal introduction and 20 on intercropping of cotton with greengram covering 14 ha were conducted by KVKs of Karnataka (Table23). The seed

cotton yield was 25.46 q/ha and 24.71 q/ha, respectively leading to 3.01% and 35.71% increase in yield in varietal introduction and intercropping demonstrations as compared to checks, respectively. The crop production technology demonstrated under rainfed condition gave only 3.75 q/ha seed cotton yield.

Table 23: Frontline demonstrations on fibre crops conducted by KVKs of Karnataka

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Cotton	Crop Production (RF)	1	BG-II	10	4.00	3.75	3.00	25.00	-18125	0.75	-10250	0.66
	Varietal introduction	1	BGDS-1063	5	2.00	25.46	24.71	3.01	67142	2.22	62024	2.10
	Intercropping with greengram	1	DGGV-2 & Kanaka	20	8.00	22.04	16.24	35.71	70643	2.60	43834	2.08
Total/Average				35	14.00	23.75	20.47	19.36	68893	2.41	52929	2.09



FLD on cotton+greengram intercropping system by KVK, Gadag

3.1.2.6 Fodder crops

During the year, 157 demonstrations were conducted on fodder crops in 41.30 ha in Zone-XI. State wise and technology wise results are presented below:

Karnataka

A total of 147 demonstrations were conducted on fodder crops covering an area of 41.10 ha by 13 KVKs of Karnataka (Table24). The technologies like

cultivation of improved varieties of fodder such as CoFS-29, DHN-6 and COFS-31, besides guinea, stylo grass and mixture of crops as fodder cafeteria were implemented. Guinea and stylo grass gave 1223.00 q/ha green fodder yield than check with only 244.00 q/ha. The multicut sorghum CoFS-29 demonstration gave 800.00 q/ha green fodder with net returns of ₹. 38370/ha.

Table 24: Frontline demonstrations on fodder crops conducted by KVKs of Karnataka

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Areca sheet	Fodder Production	1	Areca sheet	5	-	7.29	6.03	17.20	6700	-	-	-
Guinea and Stylo grass production	Fodder Production	1	Guinea, Stylo	16	2.00	1223.00	244.00	400.00	46333	2.11	29046	1.62
Fodder var. CoFS 31 for higher yield	Fodder development	1	CoFS-31	20	4.00	150.00	130.00	20.00	-	-	-	-
Tree fodder crops	Fodder management	1	Susbenia, Moringa	10	0.40	285.00	243.00	17.29	114300	5.05	90100	3.86
Fodder seed production	Variety demonstration	1	CoFS-29, CoFS-31	6	2.00	7.70	6.30	22.22	181000		144000	
Mixed fodder crops	Fodder	1	Co-9, DHN-6, CoFS-31	20	20.00	610.30	155.00	14.80	22170	1.37	4110	1.08
Multi-cut Sorghum variety CoFS-29	Variety demonstration	1	CoFS-29	5	2.00	800.00	600.00	33.33	38370	2.50	17300	1.93
Fodder sorghum CoFS-31	Fodder production	1	CoFS-31	30	6.00	943	745	26.51	43537	2.13	71959	2.75
Napier DHN-6	ICM	1	DHN-6	10	1.00	659.00	-	-	53900	5.49	-	-
Napier+Fodder sorghum mixed fodder	Green fodder	1	DHN-6, CoFS-31	5	1.00	1463.00	473.00	209.00	83367	2.97	9349	1.28
Fodder cafeteria	Feed and Fodder	3	CoFS-31, Hedge Lucerne, Cowpea, Guinea grass, Sesbania, Drumstick	20	2.70	196.00	-	-	102250	3.26	-	-
Total/Average				147	41.10	549.00	241	84.52	69193	3.11	52266	2.09



Demonstration on CoFS-31 fodder by KVK BRD



FLD on fodder cafeteria for stall fed goat farms at KVK Kalaburagi-I

Kerala

A total of 10 demonstrations were organized by one KVK of Kerala on fodder production technology covering an area of 0.20 ha (Table 25). Results indicated

an increase of fodder yield to the extent of 36.36% in Co-5 fodder grass with average green fodder yield of 3000.00 q/ha under demonstration over check with 2200.00 q/ha.

Table 25: Frontline demonstrations on fodder crops conducted by KVKs of Kerala

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Fodder	Variety demonstration	1	Napier CO-5	10	0.2	3000.00	2200.00	36.36	920000	4.20	6	3.14

3.1.2.7 Vegetable crops

Vegetable crops such as amaranthus, brinjal, cauliflower, chilli, cucurbits, cucumber, field bean, french bean, cluster bean, green pea, onion, tomato, ridge gourd, bitter gourd, yard long bean, watermelon and vegetable cowpea were demonstrated with improved technologies under 454 farmers' fields covering an area of 76.07 ha by the KVKs of Karnataka and Kerala states. The state wise and technology wise results are presented below:

Karnataka

A total of 327 demonstrations were conducted in major vegetables covering an area of 69.53 ha by the KVKs of Karnataka (Table 26). Cultivation of amaranthus recorded 29.80% increased green leaf yield (19.25 q/ha) with BCR of 14.40 as compared to check. In tomato, ICM, INM, IPDM technologies resulted an increased yield by 17.20% over check. Micronutrient management and cropping system technologies demonstrated in ridge gourd have given increased yield of 22.98% and 19.39% as compared to check, respectively. The micronutrient management demonstration in bitter gourd recorded yield of 1063.00 q/ha with BCR of 1.92. In spine gourd, demonstration of Arka Neelanchal recorded an average yield of 78.50 q/ha (59.39 % increased yield) as compared their check (49.25 q/ha). In brinjal, INM technology gave 354.00 q/ha leading to 21.11% increase of yield over their check. IPM demonstration in cauliflower gave 11.14% increased yield (26.83 q/ha) over their check. In chilli, varietal demonstration of Arka Meghana gave an average 252.00 q green chilli/ha over check with 192.00 q/ha. ICM in Daiya 619 variety of chilli has given yield of 145.80 q/ha with BCR of 3.74 as compared to 117.80 q/ha in check. In French bean, ICM and organic farming gave an increased yield to the extent of 24.40% and 22.10%,

respectively over their checks. Varietal demonstration of Arka sampurna in green pea gave yield of 5.65 q/ha, which is 44.07 % higher than the check. Weed management in field bean recorded yield to the extent of 32.50 q/ha as compared to 29.12 q/ha in check. In yardlong bean, improved variety Arka Mangala gave an yield of 211.57 q/ha over check with only 161.30 q/ha. IPM in cucurbits recorded yield to the extent of 123 q/ha as compared to 107.5 q/ha in check. Similarly, ICM demonstration in cluster bean gave 42.60 q/ha yield as compared to 38.20 q/ha in check. In cucumber, micro nutrient management technology recorded 12.34% higher yield (1374.00 q/ha) over its check (1223.00 q/ha). The micronutrient management technologies demonstrated in watermelon recorded a yield of 4329.00 q/ha as compared to check with only 3973.00 q/ha. The nutri farm demonstrated in schools by four KVKs through 80 demonstrations gave an average vegetable yield of 106.72 q/ha per annum. In onion, INM, ICM, varietal demonstration and weed management (Arka Kalyan, Bellary red and Bheema super) technologies were demonstrated through 80 farmers' fields. All the technologies gave higher yield ranging from 17.44% to 28.85%. ICM practice has given yield of 175.67 q/ha with BCR of 9.92 in onion as compared to 140.70 q/ha in check. Varietal demonstration of Bhima super recorded higher yield of 241.00 q/ha as compared to check with 166 q/ha. ICM in white onion and IPDM in small onion gave higher yield of 124.44 q/ha and 8.68 q/ha as compared to check, respectively.

Table26: Frontline demonstrations on vegetables crops conducted in the state of Karnataka

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Amaranthus	Varietal Evaluation	1	Arka Arunima	5	2.00	192.5	135	29.80	537000	14.40	260000	9.60
Tomato	ICM	1	Local	10	4.00	219.5	155	29.38	74040	1.88	18600	1.20
	INM	1	DMT-2	5	2.00	468	406	13.24	169000	3.60	141000	3.27
	IPDM	1	NS-5002	3	1.00	669.9	614.7	8.98	598504	3.91	461566	3.15
	Total/Average			18	7.00	452.5	391.93	17.20	280515	3.13	207055	2.54
Ridge gourd	Cropping System	2	Arka Prasan, Saniya	25	3.00	247.00	207.35	19.39	196250	2.59	139150	2.13
	Micro nutrient management	1	Private variety	2	0.80	610.00	496.00	22.98	36174	1.74	29975	1.67
	Total/Average			27	3.80	429.00	352.00	21.19	116212	2.17	84563	1.90
Bittergourd	Micro nutrient management	1	Private variety	2	0.80	1063.00	953.00	11.51	61045	1.92	40933	1.64
Spine gourd	Varietal demonstration	1	Arka Neelanchal, Shanthi	5	1.00	78.50	49.25	59.39	183550	2.40	78765	1.66
Brinjal	INM	1	Arka Harshitha	5	1.00	354.00	292.00	21.11	139320	2.54	93380	2.14
	IPDM	1	Ankur Vijay	3	1.00	316.6	297.7	6.35	319551	4.47	267451	3.97
	Total/Average			8	2.00	335.3	244.8	13.73	229436	3.51	180416	3.06
Cauliflower	IPM	1	Suhasini plus	3	1.00	268.3	241.4	11.14	355500	3.79	256036	2.96
Chilli	ICM	1	Daiya 619	5	1.00	145.80	117.80	23.76	192318	3.74	146496	3.25
	Varietal demonstration	1	Arka Meghana	10	1.00	252.00	192.00	31.25	266100	3.14	173100	2.39
	Intercrop in onion	1	Arkakyathi	10	2.00	904.9	520	4.40	513000	12.40	330000	10.43
	Total/Average			25	4.00	162.70	120.60	19.80	323806	6.43	216532	5.36
French bean	ICM	2	Arka Arjun	10	2.00	107.80	62.70	24.40	137912	3.16	87518	3.31
	Organic farming	1	Arka Sharath	5	1.00	112.20	91.90	22.10	1,35,169	5.07	1,01,597	3.80
	Intercropping in Areca plantation	1	Arka Arjun	10	2.00	46.5+ 8750 nuts	8707 nuts/ha		64670	2.62	96686	2.77
	Total/Average			25	5.00	88.80	77.30	23.50	112583	3.62	95267	3.29
Green pea	Varietal demonstration	1	Arka Sampoorna	5	2.00	5.65	3.16	44.07	392000		205000	
Field bean	Weed management	1	HA 4	5	2.00	32.50	29.12	11.60	52000	2.33	44336	2.19
Yard long Bean	Varietal demonstration	1	Arka Mangala	10	1.00	211.57	161.30	31.18	303140	3.53	207650	2.81
Cucurbits	IPM	1	Private variety	5	2.00	123.00	107.50	14.41	73700	2.42	54350	2.02
Cluster Bean	ICM	1	PUSA Noubaha	10	2.00	42.60	38.20	11.50	63794	1.80	47195	1.60
Cucumber	Micro nutrient management	1	Private variety	2	0.8.00	1374.00	1223.00	12.34	95290	2.77	69275	1.58
Watermelon	Micro nutrient management	1	Private variety	2	0.80	4329.00	3973.00	8.96	274532	5.51	219260	4.73
Nutri-farm	Nutritional security	4	Mixed vegetables	80	0.33	106.72			482107	2.88		

Onion	ICM	5	Raj onion, Bheema Dark Red, Ballary red, Bheema Super	30	12.00	175.67	140.70	23.55	732280	9.92	547158	8.94
	INM	1	Bhima Super	20	4.00	176.60	137.05	28.85	283842	3.71	38656	1.28
	Varietal demonstration	1	Bhima super	10	4.00	241.00	166.00	31.10	436000	11.9	297000	9.49
	Weed management	1	Pvt variety	10	4.00	183.70	153.10	19.98	115050	2.70	76105	2.00
	Weed management	1	Arka Kalyan	10	4.00	188.50	160.50	17.44	119850	2.70	83500	2.10
	Total/Average				80	28.00	193.09	151.47	24.18	337404	6.19	208484
White onion	IPDM	1	Thelagi White	5	2.00	124.44	105.33	18.15	71217	2.80	55080	2.42
Small Onion	ICM	1	Co-5	5	2.00	8.68	8.12	6.89	141975	2.89	115410	2.32
Grand total				327	69.53							



FLD on IPDM in brinjal by KVK, Bengaluru Rural



Demonstration on nutri garden by KVK, Gadag

Kerala

A total of 132 demonstrations were implemented by KVKs of Kerala in vegetable crops such as bhendi, bitter gourd, brinjal, carrot, cowpea, tomato and snake gourd covering an area of 6.70 ha mostly in the homestead farming situation (Table 27). IDM and INM technologies in bhendi led to 72.20 % and 48.00 % increased yield over check, respectively. In bitter gourd, pest management technology performed superior by recording 30.35% increased average yield over check. High yielding variety Haritha of brinjal gave 29.42 q/ha yield as compared to only 24.54 q/ha in check. IPDM technology in carrot has given 75.00

q/ha yield with BCR of 2.80. Snake gourd variety Kaumudi gave an average yield of 254.30 q/ha as compared to check with 200.50 q/ha. Grafting technique in tomato recorded 290.00 q/ha as compared to 165.00 q/ha in check. Vegetable cowpea performed better under ICM, bio intensive pest and disease management and improved varietal demonstrations. Among these, disease management and bio intensive pest and disease management practices resulted in higher yield of 244.00 q/ha and 225.00 q/ha, respectively.

Table 27: Frontline demonstrations on vegetables conducted by KVKs of Kerala

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Bhendi	Hydroponics	1	Arka Samrat	9	-	193.50	-	29.00	52250	1.08	-	-
	INM	1	Samrat	3	0.12	164.50	111.00	48.00	242950	1.73	94000	1.32
	IDM	1	Arka Anamika	5	0.10	79.18	71.40	72.20	162947	3.63	98,250	2.51
				17	0.22	145.70	91.20	49.73	152716	2.15	96125	1.92
Bitter gourd	Pest management	1	Priyanka	5	0.01	202.30	160.00	26.46	631000	2.08	356000	1.59
	IPDM	2	Preethi, Priyanka	15	0.44	114.20	77.50	34.23	176634	1.81	39375	1.20
	Total			20	0.45	158.30	118.75	30.35	403817	1.94	197688	1.39
Brinjal	IPM	1	Haritha	5	0.30	29.42	24.54	19.89	317602	1.76	209882	1.52
Carrot	IPDM	1	local	5	1.00	75.00	60.00	20.00	72500	2.80	50000	2.25
Snake gourd	Bio intensive pest and disease management	1	Kaumadi	5	0.20	246.50	195.00	26.05	369200	2.01	183000	1.46
	ICM	1	Kaumudi	20	0.40	262.00	206.00	27.10	471102	2.01	282341	1.63
	Total			25	0.60	254.30	200.50	26.58	420151	2.01	232671	1.54
Tomato	Grafting technique	1	Grafted tomato	5	0.06	290.00	165.00	75.00	387000	3.01	187000	2.31
Cowpea	ICM	2	Arka Mangala	15	1.50	214.00	180.00	18.89	752730	2.48	458250	1.90
	Bio intensive pest and disease management	1	Arka Mangala	10	1.00	225.00	183.00	22.60	823560	2.61	440500	1.86
	Disease management	2	Geethika	10	0.21	244.00	164.00	47.53	785000	2.37	299000	1.44
	Variety demonstration	1	Githika	10	1.00	192.00	162.00	18.52	456450	2.12	332800	1.84
	Varietal demonstration	1	Arka Mangala	5	0.20	193.00	162.00	19.00	221000	1.61	131000	1.37
	Total			50	3.91	226.33	169.33	33.59	570957	2.3	308092	1.7
Grand total				127	6.54							



Demonstration on grafted tomato seedlings in Kottayam district

3.1.2.8 Tuber crops

A total of 45 demonstrations were conducted on major tuber crops like potato, elephant foot yam and cassava covering an area of 10.03 ha by KVKs of Zone-XI. State and technology wise results are discussed below:

Karnataka

A total of 20 demonstrations were conducted on ICM

technology in potato covering an area of 6.00 ha in two KVKs of Karnataka. Results indicated that demonstrated technologies out yielded its check to the extent of 33.08%. The tuber yield obtained with ICM technology was 136.00 q/ha as compared to 101.60 q/ha in check.

Table 28: Frontline demonstrations on tuber crops conducted by KVKs of Karnataka

Crop	Thematic area	Variety	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Potato	ICM	Kufri Jyothi	2	20	6.00	136.00	101.60	33.08	104491	2.40	59778	1.77



FLD on ICM in potato by KVK, Chamarajanagara

Kerala

A total of 25 frontline technologies were demonstrated in tuber crops like elephant foot yam and cassava in 4.03 ha area by 4 KVKs of Kerala (Table 29). Gajendra variety of elephant foot yam recorded average yam yield of 283.75 q/ha as compared to 256.25 q/ha in check. In

Cassava, demonstrations resulted in higher average yield of 421.00 q/ha, and net return of ₹. 209635/ha as compared 372.00 q/ha and net returns of ₹. 141575/ha in check.

Table 29: Frontline demonstrations on tuber crops conducted by KVKs of Kerala

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Elephant foot yam	Varietal demonstration	1	Gajendra	5	0.02	300.00	280.00	10.00	520000	2.40	210000	1.60
	INM	1	Gajendra	5	0.01	267.50	232.50	15.05	277500	1.53	118750	1.26
	Total/Average			10	0.03	283.75	256.25	12.52	398750	1.96	164375	1.43
Cassava	INM	1	Ambakadan	10	2.00	679.00	625.00	8.69	336470	1.98	268150	1.75
	Bio intensive pest and disease management	1	Local	5	2.00	163.00	120.00	37.67	82800	1.50	15000	1.09
	Total/Average			15	4.00	421.00	372.00	23.00	209635	1.74	141575	1.42
	Grand total			25	4.03							



FLD on amorphophallus variety- Gajendra by KVK Kannur

3.1.2.9 Fruit crops

A total of 177 demonstrations on major fruit crops like banana, grapes, citrus, mango, papaya pomegranate, coorg mandarin, lime and guava were conducted by KVKs of Zone-XI covering an area of 48.62 ha during the year. State and technology wise results are discussed in the foregoing discussions.

Karnataka

A total of 129 demonstrations on various fruit crops were conducted in farmers' fields covering 42.51 ha area (Table 30). Results indicated that the yield was substantially higher under demonstrations of ICM, IPDM and nutrient management technologies in banana. Among the technologies demonstrated in banana, nutrient management technology registered highest yield of 157.00 q/ha in *yelakki* variety and 458.50 q/ha in G-9 variety with higher economic benefits as compared to their checks. ICM and IDM in acid lime (citrus) also performed superior under

demonstrations with better economic returns. Demonstration of ICM in Coorg mandarin gave a fruit yield of 153.70 q/ha with better economic returns. In grapes, demonstration on nutrient management with Thompson seedless variety gave 1245.00 q/ha yield as compared to check with 1089 q/ha. Demonstrated IPM technology in guava gave 10.95% higher yield over check. ICM, INM, irregular bearing and pest management demonstrations in mango resulted in overall increase of 15.55% in yield over check. Among these demonstrations, alphanso variety recorded higher yield of 600.00 q/ha with BCR of 6.30. In pomegranate, IDM and ICM demonstrations proved superior by recording higher yield than checks. Average yield under ICM demonstration in pomegranate was 96.00 q/ha as compared to 81.00 q/ha in check.

Table30: Frontline demonstrations on fruit crops conducted by KVKs of Karnataka

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Banana	ICM	2	Yelakki	20	8.00	33.75	28.89	15.84	445597	3.47	359607	3.00
	Nutrient management	1	Yelakki	1	0.40	157.00	138.00	13.76	163400	1.90	123595	1.69
	IPDM	1	Yelakki	15	6.00	28.81	22.78	26.84	735383	3.71	507358	2.77
	Nutrient management	1	G-9	2	0.80	458.50	429.00	6.87	284950	3.40	240025	2.88
	Total/Average			38	15.20	169.51	154.67	15.83	407333	3.12	307646	2.59
Lime	ICM	1	Kagzi lime	5	1.00	180.00	130.00	38.46	490000	2.13	252000	0.94
	IDM	1	Khagzi lime	6	2.40	127.00	94.00	35.10	57950		31030	
	Total/Average			11	3.40	153.50	112.00	36.78	273975	2.13	141515	0.94
Coorg Mandarin	ICM	1	Coorg Mandarin	5	1.00	153.70	133.00	15.50	101982	2.24	85752	2.16
Grapes	Nutrient Management	1	Thomson seedless	5	2.00	1245.00	1089.00	14.32	219280	2.42	178420	2.20
Guava	IPM	1	L-49	5	2.00	210.30	189.70	10.95	306985	7.08	233330	5.55

Mango	ICM	3	Alphanso, Mallika	27	17.00	155.60	130.97	13.70	271560	6.39	213303	5.29
	INM	1	Alphanso	10	4.00	600.00	350.00	17.14	133925	6.30	50000	3.50
	Irrregular bearing	1	Alphanso	10	1.00	217.40	188.90	15.08	308878	4.80	258465	4.20
	Pest management	1	Baneshan	10	2.00	125.60	108.00	16.29	258300	6.99	209500	5.90
	Total/Average			57	24.00	274.65	194.50	15.55	243166	6.12	182817	4.72
Pomegranate	ICM	1	Bhagwa	3	2.00	96.00	81.00	18.50	578850	7.20	380100	3.40
	IDM	1	Kesar	5	2.00	24.50	-		1470	2.88		
	Total			8	4.00							
Grand total				129	42.51							



FLD on INM in G-9 banana by KVK Kalaburagi-II



FLD on grapes by KVK Vijayapura-II

Kerala

A total of 48 demonstrations were conducted by KVKs of Kerala on banana covering 6.11 ha during the year. The technologies such as ICM, INM, micro nutrient management, pest management and problematic soil management demonstrated in Nendran banana have performed better with an average yield of 307.71 q/ha as

against their local check (244.71 q/ha). Pest management demonstration with Nendran variety gave 485.00 q/ha fruit yield as compared to 401.10 q/ha with check. Big Ebanga banana under ICM recorded 311.50 q/ha yield as compared to 240.00 q/ha under check (Table 31).

Table 31: Frontline demonstrations on fruit crops conducted by KVKs of Kerala

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Banana	ICM	1	Big Ebanga	5	0.25	311.50	240.00	29.79	502750	1.86	277500	1.49
	ICM	1	Nendran	10	1.00	271.25	200.63	35.20	585000	2.17	402440	2.00
	INM	1	Nendran	15	0.36	256.00	201.50	27.00	691250	2.17	425000	1.73
	Problematic soil management	1	Nendran	5	0.50	220.00	180.00	22.22	990000	2.20	410000	2.02
	Micro nutrient management	1	Nendran	10	1.50	302.50	245.00	23.47	307500	1.51	18500	1.33
	Pest management	1	Nendran	3	2.50	485.00	401.10	9.80	495000	2.02	91776	1.21
Total/Average				48	6.11	307.71	244.71	24.58	595250	1.99	270869	1.63



FLD on INM in banana by KVK Idukki

3.1.2.10 Plantation crops

A total of 75 demonstrations were undertaken by KVKs of Zone-XI on major plantation crops like arecanut, coconut, coffee and cashew covering an area of 24.30 ha during the year. State and technology wise results are discussed below:

Karnataka

A total of 50 demonstrations on plantation crops like

arecanut, cashew and coffee were conducted in 16.00 ha by 7 KVKs of Karnataka (Table 32). Demonstrations on arecanut gave 17.66 q/ha chali yield as compared to 14.49 q/ha in check. IPM and ICM technologies demonstrated in cashew gave an average yield of 11.00 q/ha as compared to 7.70 q/ha under check. In coffee, INM technology demonstrated in farmers' fields has given an overall 20.00% higher yield with 37.50 q/ha/year.

Table 32: Frontline demonstrations on plantation crops conducted by KVKs of Karnataka

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Arecanut	ICM	4	Hirehalli local, SAS-1, Bheemasamudra local	30	8.00	17.66	14.49	19.61	321895	4.18	237961	3.68
Cashew	ICM	1	Vengurla-4	5	2.00	11.50	9.50	21.98	105551	5.16	81089	4.09
	IPM	1	Local	10	4.00	10.50	5.94	43.42	72900	2.71	25737	1.65
	Total/Average			15	6.00	11.00	7.70	32.70	89226	3.94	53413	2.87
Coffee	INM	1	S-274	5	2.00	37.50	31.25	20.00	142200	2.35	106400	2.07
Grand total				50	16.00							



Demonstration on ICM in arecanut by KVK Hassan

Kerala

The important plantation crop of Kerala i.e coconut was demonstrated under frontline technologies such as INM and IPDM in the fields of farmers covering an area of 2.80 ha during the year (Table 33). Demonstration on INM technology gave an average yield of 12600 nuts/ha/year over check (11025

nuts/ha/year) leading to positive net returns in demonstrations. INM in arecanut has maintained remunerative returns with BCR of 1.73 as compared to 1.60 in check. In coffee, IPM technology demonstrated in farmers' fields has given an overall 11.84% higher yield with 79.00 q/ha/year.

Table33: Frontline demonstrations on plantation crops conducted in the state of Kerala

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Coconut (Nuts/ha/year)	IPDM	1	WCT	11	2.00	9900	3240	66.00	397830	1.59	115452	1.01
	INM	1	WCT	5	0.80	12600	11025	14.29	111000	2.71	85000	2.22
	Total/Average			16	2.80	11250	7133	40.00	254415	2.15	100226	1.61
Arecanut	INM	1	Mangala	5	5.00	6.20	5.55	13.00	35500	1.73	28425	1.60
Coffee	IPM	1	Robusta	4	0.50	79.00	75.00	11.84	34608	2.39	30310	2.32
Grand total				25	8.30							



Integrated management of stem bleeding in coconut by KVK Pathanamthitta

3.1.2.11 Spice crops

A total of 95 demonstrations were undertaken in major spices like black pepper, ginger, turmeric and garlic covering an area of 9.28 ha by KVKs of Zone-XI. State and technology wise results are discussed below:

Karnataka

In spices, a total of 40 demonstrations were conducted in black pepper, garlic, ginger and turmeric covering an area of 4.90 ha during the year (Table 34). Yield recorded in IDM and ICM technologies was 16.40

q/ha and 12.75 q/ha as compared to checks with 10.96q/ha and 10.15 q/ha in black pepper, respectively. IDM technology in ginger gave 249.20 q/ha rhizome yield as compared to 183.00 q/ha in check. Average yield in turmeric and garlic due to ICM demonstration was 35.22 % and 8.03% higher over their checks, respectively. Average yield recorded under demonstrations was 83.02 q/ha in turmeric and 51.10 q/ha in garlic.

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Black pepper	IDM	1	Paniyur -1	5	0.20	16.40	10.96	49.63	348565	2.98	200410	2.34
	ICM	1	Panniyur -1	20	2.00	12.75	10.15	23.31	321050	3.61	205900	3.08
	Total/Average			25	2.20	14.58	10.56	36.47	334808	3.30	203155	2.71
Ginger	IDM	1	Himachal	5	0.10	249.20	183.00	36.17	566692	4.13	383340	3.30
Turmeric	ICM	1	Prathiba	5	0.60	83.02	61.4	35.22	288100	3.08	132700	2.10
Garlic	ICM	1	Ooty Local	5	2.00	51.10	47.30	8.03	501975	2.90	389000	2.54
Grand total				40	4.90							

Kerala

A total of 55 demonstrations were implemented in black pepper, ginger and turmeric crops by 10 KVKs of Kerala covering 4.38 ha (Table 35). In black pepper, INM demonstration gave 23.30% increased yield (17.90 q/ha) over check (14.45 q/ha). BCR of black pepper demonstration was 1.88 as compared 1.61 in check. Turmeric yield was higher with varietal demonstration with 128.95 q/ha as compared to 84.2q/ha in check.

Whereas seed production in Kasturi turmeric recorded 40.00 q/ha with net returns of ₹. 340000/ha. In ginger, INM, IDM, IPDM and seed production demonstrations gave higher yield of 165.00 q/ha, 171.00 q/ha, 180.00 q/ha and 101.25 q/ha, which were 27.90%, 11.76%, 28.00% and 52.09% increase over their checks, respectively.

Table 35: Frontline demonstrations on spice crops conducted by KVKs of Kerala

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Black Pepper	INM	2	Panniyur - 1	10	0.90	17.90	14.45	23.30	240000	1.88	149875	1.61
Turmeric	Varietal demonstration	2	Pragati	15	1.06	128.95	84.20	46.54	418386	2.51	200152	1.96
	INM	1	Pragati	3	0.10	150.00	121.00	90.00	2,14,500	1.95	157821	1.43
	Total/Average			18	1.16	139.48	102.60	68.27	316443	2.23	178987	1.70
Kasturi turmeric	Seed production	1	Original	4	0.10	40.00	-	-	340000	2.30	-	-
Ginger	INM	1	Varada	5	0.40	165.00	129.00	27.90	272500	1.89	161500	1.55
	IDM	1	Rio de janeiro	10	1.20	171.00	153.00	11.76	771568	2.57	747880	2.51
	IPDM	1	Mahima	3	0.12	180.00	141.00	28.00	454800	1.90	322881	1.69
	Seed production	1	Varada	5	0.50	101.25	-	-	323229	1.32	-	-
	Total/Average			23	2.22	154.00	141.00	23.00	455524	1.93	410754	1.91
Grand total				55	4.38							



Demonstration of IISR micronutrient mixture application in ginger by KVK Kollam

3.1.2.12 Flower crops

A total of 50 demonstrations on flower crops covering an area of 12.08 ha were implemented by KVKs of Zone-XI during the year. Technology wise results are discussed in foregoing discussion.

Karnataka

Demonstrations were conducted in flower crops such as

marigold and tube rose covering 0.08 ha by KVKs of Karnataka (Table 36). Demonstration of Arka Agni variety in marigold recorded higher yield of 71.25 q/ha as compared to 52.5 q/ha in check. ICM technology in tube rose has given 25.00% higher yield (187.00 q/ha) with Arka Prajwal variety as compared to 150.00 q/ha in check.

Table 36: Frontline demonstrations on flower crops conducted by KVKs of Karnataka

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Marigold	Varietal demonstration	1	Arka Agni	5	0.06	71.25	52.50	35.71	310000	2.38	170000	1.76
Tuberose	demonstration of variety	1	Arka Prajwal	5	0.02	187.00	150.00	25.00	383514	2.76	233515	2.08
Grand total				10	0.08							

Kerala

Demonstrations were conducted on flower crops chrysanthemum, gaillardia and rose covering 12 ha by KVKs of Kerala (Table 37). ICM demonstration in chrysanthemum recorded higher yield of 144.08 q/ha as compared to 128.93q/ha in check. BCR was also higher (3.81) in demonstrated flower crop than check

(3.04) due to higher market price. IPDM technology in gaillardia has given 15.88% higher yield (74.50 q/ha) as compared to check. Yield of rose was 121.52 q/ha under demonstration of Cherishma variety as compared to 109.34 q/ha under check.

Table37: Frontline demonstrations on flower crops conducted by KVKs of Kerala

Crop	Thematic area	KVKs (No.)	Variety	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of demonstration (₹./ha)		Economics of check (₹./ha)	
						Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Chrysanthemum	ICM	3	Purnima, Arka Kamini, Scent white	20	4.00	144.08	128.93	60.13	429884	3.81	358935	3.04
	IPDM	2	Kurnool, Chandani	10	4.00	55.73	46.95	17.24	215779	2.36	164221	2.11
	Total/Average			30	8.00	99.90	87.94	38.68	322832	3.08	261578	2.57
Gaillardia	IPDM	1	Galate	5	2.00	74.50	64.25	15.88	161232	2.18	128278	2.00
Rose	ICM	1	Cherishma	5	2.00	121.52	109.34	11.10	842246	4.34	676696	3.20
Grand total				40	12.00							

3.1.2.13 Demonstrations on hybrids

During the year, 356 demonstrations on hybrids in various crops like paddy, maize, tomato, sunflower, cabbage, chilli, brinjal, cucurbits, marigold, onion, tomato, watermelon, muskmelon etc. were conducted by

KVKs in the states of Karnataka (341) and Kerala (15) covering 122.62 ha. State, crop and hybrid wise results are presented as under:

Karnataka

A total of 341 demonstrations were conducted by KVKs of Karnataka on hybrids covering 121.80 ha as presented in Table 38. KRH-4 hybrid of paddy recorded higher yield of 73.00 q/ha as compared to only 39.80 q/ha in check. In maize mostly private hybrids were demonstrated, which gave higher yield ranging from 11.34% to 25.46% higher yield over check. In sunflower, RSFH-1887 recorded 28.42 % higher yield (18.66 q/ha) over check (14.53 q/ha). In cotton, mostly Bt hybrids were demonstrated in 46 farmers fields covering 18.4 ha across 6 KVKs performed superior (27.41%) to check with better BCR (3.40). Average yield in Bt hybrids was 22.12 q/ha as compared to 17.64 q/ha under check. In cabbage, Unnati hybrid recorded 12.16% higher yield (26.84 q/ha) as compared to check (23.93 q/ha). Brinjal hybrids Arka Niketha and Arka Anand performed superior to their checks by registering an average yield of 208.30 q/ha and 621.00 q/ha, respectively with higher economic returns. In chilli, hybrids Arka Kyathi, Arka Haritha, Vaishnavi and

Sitara have performed superior to their checks. The private hybrid of cucurbit gave higher yield of 123.00 q/ha, which was 14.42 % higher over check. Marigold hybrid Benz tall gave 11.77 q/ha yield as against check (9.76 q/ha) with yield increase of 20.59% and BCR 1.98. Onion hybrid Arka Laalima gave 282.00 q/ha as compared to check (220.00 q/ha) with yield increase of 28.18% and BCR 5.26. IIHR hybrids of tomato namely Arka Samrat (655.00 q/ha), Arka Rakshak (570.00 q/ha) and Arka Abhed (482.00 q/ha) have performed better than checks and gave better economic returns to the farmers. However, although private hybrid Saaho gave 29.00% higher yield but the net return was less as compared to check on account of less preference in market for Saaho. In watermelon, Namdhari gave 431.30 q/ha. Private hybrid Patasha of muskmelon recorded yield of 36.30 q/ha with net returns of ₹. 484070/ha.



Demonstration on maize hybrid MAH 14-5 by KVK, Mandya

Table38: Frontline demonstrations on hybrids conducted in the state of Karnataka

Crop	Name of hybrid	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of hybrid (₹./ha)		Economics of check (₹./ha)	
					Demo	Check	Change (%)	Net returns	BCR	Net returns	BCR
Paddy	KRH-4	1	10	4.00	73.00	39.80	83.42	12677	1.21	54567	1.99
Maize	CP-819	3	30	12.00	58.02	49.97	15.75	64176	2.72	51077	2.41
	Dekalb-9141	1	10	2.00	75.19	66.36	13.31	84158	2.27	56074	1.88
	DKC 1972	1	5	2.00	54.15	48.08	12.62	61376	2.58	50140	2.29
	MAH-14-5	7	50	20.00	68.99	61.53	12.51	74706	2.68	72661	2.66
	SONA 5101	1	10	4.00	67.50	53.80	25.46	39700	2.15	25375	1.75
	NK-6240	1	5	5.00	22.80	18.20	25.27	18627	1.59	30574	4.20
	Pioneer (P3 501)	1	10	4.00	54.00	48.50	11.34	59723	2.86	50538	2.59
Sunflower	RSFH- 1887	1	10	2.40	18.66	14.53	28.42	217565	14.87	38542	3.21
	KBSH-78	1	10	4.00	10.31	3.39	204.10	104962	5.40	10490	1.37
Bt Cotton	Pvt Hybrids (Myhico, Ajit 155, Minarva)	6	46	18.40	22.12	17.64	27.41	72102	3.40	64293	2.59
Cabbage	Saint	1	10	4.00	247.50	227.0	9.03	156470	5.01	100822	3.45
	Unnati	1	5	1.00	268.4	239.3	12.16	180880	3.07	123318	2.34
Brinjal	Arka Nikitha	2	10	3.00	208.30	173.40	20.27	240130	2.96	168438	2.30
	Arka Anand	1	5	1.00	621.00	531.00	16.95	862270	5.32	982800	4.79
Chilli	Sitara	2	20	8.00	177.90	151.90	16.84	372651	4.69	281606	3.78
	Arka Kyathi	1	10	2.00	306.30	219.60	39.48	168556	2.77	252500	3.20
	Vaishnavi	1	5	1.00	215.80	188.40	14.54	470134	2.91	571154	3.29
	Arka Harita	1	5	1.00	224.90	177.50	26.70	157080	3.81	211940	4.66
Cucurbits	Private	1	5	2.00	123.00	107.50	14.42	54350	2.02	73700	2.43
Marigold	Benz tall	1	5	1.00	11.77	9.76	20.59	84500	1.98	116708	2.31
Onion	ArkaLaalima	1	5	2.00	282.00	220.00	28.18	375600	5.26	531450	5.83
Tomato	Shivam(Pvt.)	1	10	4.00	61.14	55.21	10.74	27261	1.42	14446	1.21
	Arka Abhed	1	5	1.00	482.00	384.00	25.52	549100	4.15	357540	2.98
	Arka Samrat	1	10	2.00	655.00	520.00	25.96	167000	2.76	105000	2.02
	Arka Rakshak	1	5	2.00	570.00	380.00	50.00	448000	4.67	258000	3.11
	Abhinav (Pvt.)	1	5	1.00	613.00	543.60	12.77	244980	2.00	301340	2.20
	Saaho(Pvt.)	1	5	1.00	645.00	500.00	29.00	254890	2.20	385575	2.77
Watermelon	Naamdari	2	15	6.00	431.30	296.90	40.06	247875	3.82	146250	2.60
Muskmelon	Patasha (Kalash seeds)	1	5	1.00	363.00	254	42.86	484070	4.20	244684	3.85
Grand total			341	121.8							

Kerala

A total of 15 demonstrations were conducted on hybrids in cabbage and tuberose with Green Voyager and Arka Prajwal, respectively. Results revealed that higher yield

of 187.00 q/ha over check (150.00 q/ha) in tuberose hybrid with net returns of ₹.383514/ha and 19.89 q/ha in cabbage hybrid with net returns of ₹. 317645 /ha were recorded.

Table 39: Frontline demonstrations on hybrids conducted by KVKs of Kerala

Crop	Name of hybrid	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics of hybrid (₹./ha)		Economics of check (₹./ha)	
					Demo	Check	% change	Net returns	BCR	Net returns	BCR
Cabbage	Green Voyager	1	10	0.80	198.90	-	-	317645	1.52	-	-
Tuberose	Arka Prajwal	1	5	0.02	187.00	150.00	24.67	383514	2.77	23514	2.08
Grand total			15	0.82							

3.1.2.14 Frontline demonstrations on farm implements/machinery

Farm mechanization was popularized through 60 demonstrations on various farm implements/machinery covering an area of 8.80 ha during the year by KVKs of Zone-XI. State wise details of implements/machinery demonstrated are presented in the forgoing discussion.

Karnataka

Farm implements/machinery such as spiral separator, cono weeder and cotton picking machine were demonstrated covering 8.00 ha and 50 farmers by 4

KVKs of Karnataka (Table 40). Spiral separator insoyabean demonstrated in 30 farmers' fields was found to reduce labour requirement by 80.00 to 162.00% as compared to check. Use of cono weeder in paddy has reduced the labour required to cover 1 ha to 2 man days as against 22 man days and cost reduction by 137.00% over check. Demonstration of cotton picking machine reduced the labour requirement and cost of cotton picking by 50.00% as compared to manual picking.

Table 40: Frontline demonstrations on farm implements conducted in the state of Karnataka

Name of the implement	Crop	Farmers (No)	Area covered (ha)	KVKs (No)	Field observation	Field observation (output/manhour)			Labour reduction (mandays/ha)			Cost reduction (₹./ha or ₹./Unit)		
						Demo	Check	Change (%)	Demo	Check	Change (%)	Demo	Check	Change (%)
Spiral separator	Soybean	20	-	1	capacity q/hr	1.15	0.224	80.00	2	10	80.00	33	33	296.00
Spiral separa	Soybean	10	-	1	Cleaning (q/hr)	2.25	8.16	72.40	2	66	162.00	338	1224	262.00
Conoweeder	Paddy	10	4.00	1	Weeding/s q.m	16.00	38.00	58.00	2	22	100.00	2400	5700	137.00
Cotton picking machine	Bt. Cotton	10	4.00	1	Cotton picking/sq.m	50.00	100.00	50.00	25	50	50.00	7500	15000	50.00
Total		50	8.00											



Demonstration on spiral separator by KVK Belagavi-I

Kerala

Paddy mechanization was attempted through transplanter and power weeder by KVKs of Kerala during the year (Table 41). Four row walking type paddy transplanter has reduced the labour requirement to

transplant paddy by 92.00% and cost of transplanting by 63.80%. Similarly, two-row paddy power weeder reduced the labour requirement for paddy weeding by 92.00% and cost of weeding by 84.20%.

Table41:Frontline demonstrations on farm implements conducted by KVKs of Kerala

Name of the implement	Crop	Farm-ers (No)	Area covered (ha)	Field observa tion	Field observation (output/man hour)			Labor reduction (man days/ha)			Cost reduction (₹./ha or ₹./Unit)		
					Demo	Check	Change (%)	Demo	Check	Change (%)	Demo	Check	Change (%)
Four row walking type paddy transplanter	Paddy	5	0.40	Area coverage (ha/hr)	0.20	0.005	97.50	2	25	92.00	6650	18400	63.80
Two row power paddy weeder	Paddy	5	0.40	Area coverage (ha/hr)	0.10	0.005	95.00	2	25	92.00	2370	15000	84.20
Total		10	0.80										



Demonstration of 4 row walking type transplanter in Kollam district

3.1.2.15 Farm enterprises

A total of 114 demonstration units were established on farm enterprises such as value addition, processing and sericulture benefiting 244 farmers/farm women.

Karnataka

A total of 109 demonstration units were established

under various small scale income generating enterprises such as value addition to millets, tamarind, nutri gardens, sericulture and mushroom production. KVK wise enterprises established are presented in Table 42.

Table 42: Frontline demonstrations on farm enterprises conducted by KVKs of Karnataka

Name of KVK	Category	Farmers (No)	Units (No)	Major parameters	Production/unit/year	Economics of demonstration (₹.) or ₹./unit		
						Gross cost	Net return	BCR
Belagavi-I	Value addition - EDP on oil expeller	5	1	Oil extracted/year (l)	22.5	2750	625	1.22
Belgavi -II	Value addition - Foxtail millet cookies	8	1	Quantity processed (q/unit)	1	18000	7000	1.39
	Value addition - Finger millet cookies	8	1	Quantity processed (q/unit)	1	15000	10000	1.67
	Value addition - Little millet sandige, ragi laddu, ragi halwa, navanenipatu, navane chakli	5	1	Quantity processed (q/unit)	5	120000	30000	1.26
Gadag	Value addition - Tamarind lollypop	4	1	Additional income (Rs/kg)	425	300	325	2.08
	Value addition - Tamarind Chutney	4	1	Additional income (Rs/kg)	200	200	200	2.00
Tumakuru - I	Oyster mushroom	30	2	Yield (kg/unit/batch)	18.5	1888	2832	2.50
	Production, Branding and Market linkage of value added foxtail millet products as IGA	40	1	Quantity processed (q/unit)	40	160000	56000	1.35
Tumakuru - II	EDP on Tamarind Value addition, Branding and market linkage	2	2	Quantity processed (q/unit)	1	35330	46670	2.64
Hassan	Nutri-farms for year round vegetable production	10	10	production of vegetable (kg/unit/day)	233	4735	920	3650
Davanagere	Terrace garden	10	10	Vegetables (kg/day)	15			

Kolar	Production of improved mulberry and silkworm hybrids rearing	20	20	Cocoon yield (q/100 DFLs)	1.07	15755	24558	2.69
Chikkaballa pura	Production of improved mulberry and silkworm hybrids rearing	20	20	Cocoon yield (q/100 DFLs)	0.90	10472	22041	2.85
Belagavi-1	Production of improved mulberry and silkworm hybrids rearing	10	10	Cocoon yield (q/100 DFLs)	0.75	12278	17682	2.44
Hassan	Production of improved mulberry and silkworm hybrids rearing	10	10	Cocoon yield (q/100 DFLs)	0.74	15600	21500	2.38
Mandya	Production of improved mulberry and silkworm hybrids rearing	15	15	Cocoon yield (q/100 DFLs)	0.85	18686	25480	2.36
Gadag	Production of improved mulberry and silkworm hybrids rearing	3	3	Cocoon yield (q/100 DFLs)	486	55693	114525	3.05
Total		204	109					



EDP on oil extraction unit under KVK Belagavi-I

Kerala

A total of 5 demonstration units were established by KVKs of Kerala under various small scale enterprises on processing and value addition and mushroom

production for higher income generation. KVK wise enterprises are presented in Table 43.

Table 43: Frontline demonstrations on farm enterprises conducted by KVKs of Kerala

Name of KVK	Category	Farmers (No)	Units (No)	Major parameters	Production/unit/year	Economics of demonstration (₹.) or ₹./unit		
						Gross cost	Net return	BCR
Trivandrum	EDP on bittergourd products	10	1	Quantity processed (q/unit)	2.24	9535	13515	2.40
Trivandrum	EDP on value addition in mushroom	20	2	Quantity processed (q/unit)	2.40	9765	17460	2.70
Wayanad	Value addition - Avocado milk shake	5	1	Quantity processed (q/unit)	0.25	14000	17000	2.21
Wayanad	Value addition - Avocado cake	5	1	Quantity processed (q/unit)	0.10	38400	14100	1.36
Total		40	5					

3.1.2.16 Livestock

A total of 552 demonstration units were conducted in livestock including poultry during the year by KVKs of Zone-XI. State wise break up includes 235 in Karnataka and 317 in Kerala. State and enterprise wise results are given below.

Karnataka

A total of 93 in dairy, 10 in buffalo, 117 in sheep and goat and 15 in piggery units were demonstrated during the year (Table 44). In dairy, technologies such as Prevention and control of milk fever in cross breed cows, Demonstration of CIDR synch in anoestrus animals, Preventive strategies for subclinical and clinical mastitis, Nutritional and hormonal management in indigenous cows, Fodder crops and azolla production and its impact on milk yield, Silage production, Hydroponic fodder

production and Area specific mineral mixture to enhance milk yield were demonstrated. In buffalo, management practices to reduce prolapse in buffalos was demonstrated. In sheep and goat, balanced nutrition and deworming in goats, fodder crops in stall feeding lactating goats, use of special feed pellets for calcium supplementation in lactating goats, deworming and balanced feeding as per NRC standards, strategic health care practices in sheep flock from weaning till the age of maturity, supplementation of immuno boosters to stall fed small ruminants and species-specific mineral mixture for small ruminants in intensive system of rearing were demonstrated. Integrated approaches to reduce piglet mortality at the age of weaning was demonstrated in piggery. Details and results are given in Table 44.

Table 44: Frontline demonstrations on livestock conducted by KVKs of Karnataka

Name of the technology demonstrated	Name of KVK	Farmers (No)	Units (No)	Major parameters	Major parameters			Other parameters	Other parameters		Net returns (₹.)	
					Demo	Check	Change (%)		Demo	Check	Demo	Check
Dairy												
Integrated dairy management	Kalaburagi -I	5	5	Milk Yield (l/cow/day)	11.45	9.00	27.20	FAT (%)	4.30	3.50	472	280
Prevention and control of milk fever in cross breed cows	Belagavi-I	5	2	Milk yield (l/cow/day)	9.00	8.50	6.00	Susceptibility to milk fever	Nil	Nil	7650	6100
Demonstration of CIDR synch in anoestrus animals	Uttara Kannada	10	10	Conception rate (%)	60.00	0	-	Animals shown heat (No)	10.00	3.00	3678	-
Preventive strategies for subclinical and clinical mastitis	Uttara Kannada	10	20	SNF (%)	8.81	8.06	9.30	Incidence of subclinical mastitis (%)	10.00	90.00	6400	1813

Management of ectoparasite infestation	Dharwad	10	10	Milk yield (l/cow/day)	6.50	4.00	62.50	Prevalence (%)	0	72.00	-	-
Pre and post partum feeding and nutritional management	Mysuru	8	8	Milk yield (l/cow/day)	6.60	5.80	13.70	Body condition score (Numerical)	3.80	3.40	30730	17250
Nutritional and hormonal management in indigenous cows	Tumakuru I	10	10	Time taken for involution of uterus	95.00	180.00	47.00	Insemination (No.)	2.00	6.00	-	-
Fodder crops and azolla production and its impact on milk yield	Gadag	5	5	Milk yield (l/cow/day)	8.26	6.70	23.00	-	-	-	39755	15890
Silage production	Gadag	10	10	Milk yield (l/cow/day)	7.56	6.55	15.00	-	-	-	19576	15066
Hydroponic fodder production and milk yield	Gadag	10	3	Milk yield (l/cow/day)	8.42	7.25	16.00	-	-	-	35073	21229
Area Specific mineral mixture to enhance milk yield	Gadag	10	10	Milk yield (l/cow/day)	7.15	6.10	17.00	-	-	-	20522	13015
Total		93	93									
Buffalo												
Management practices to reduce prolapse in buffalos	Tumakuru I	10	10	Occurrence of prolapse (%)	1.00	20.00		Metritis (%)	16.00	-	-	-
Sheep and goat												
Balanced nutrition and deworming in goats.	Belagavi-1	10	10	Body weight (kg/animal)	23.00	18.00	27.80	Susceptibility to diseases	10.00	25.00	71401	55650
Fodder crops in stall fed calcium supplementation in lactating goats	Raichur	5	5	Fodder yield (q/ha)	108.00	75.00	139.00	Body weight gain (kg/month)	3.10	2.00	237000	180000
Use of special feed pellets for calcium supplementation in lactating goats	Raichur	10	10	Body weight gain in lambs	4.00	2.50	73.00	Mortality (%)	2.00	4.00	-	-
Fodder cafeteria and its impacts on stall fed goats	Kalaburagi-I	6	2	Body weight (kg/animal)	35.00	29.00	20.69				10800	8400
Deworming and balanced feeding as per NRC standards	Davanagere	5	50	Body weight gain in 90 days (kg/animal)	69.20	53.00	30.56	Cost of meat production per kg (₹.)	148.50	170.00	10510	6900
Strategic health care practices in sheep flock from weaning till the age of maturity	Ballari	15	15	Live body weight (kg) (At 9 month of age)	30.63	24.80	18.36	Haemoglobin (%)	13.20	9.80	5827.85	4452
Use of deworming and liver tonics	Yadgir	20	10	Body weight gain (kg/animal)	32.95	25.98	26.82				2287.5	1295
Supplementation of immuno boosters to stall fed small ruminants	Dharwad	10	10	Body weight (kg/animal)	31.50	26.50	18.86	Mortality (%)	2.00	12.00	4375	2525
Demonstration of species specific mineral mixture for small ruminants in intensive system of rearing	Koppal	5	5	Weight gain (kg/animal)	30.00	28.50	8.55	-	-	-	4660	2310
Total		86	117									
Piggery												
Integrated approaches to reduce piglet	Kodagu	5	15	Average litter size at weaning (No.)	14.00	11.00	27.27	Mortality (%)	6.80	26.60	23708	16894
Grand total		194	235									



Latitude: 14.759452
Longitude: 76.60592
Elevation: 573.01m
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Time: 20-09-2019 13:31
Note: Ramasagarahatti DFI

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Strategic health care practices in sheep flock from weaning till the age of maturity by KVK, Ballari



FLD on CIDR intravaginal application by KVK
Uttara Kannada

Kerala

A total of 216 demonstrations in dairy, 58 in sheep and goat, and 43 in poultry were conducted during the year (Table 45). In dairy, technologies such as Masti-guard germicidal teat protect spray for preventing common mastitis bacteria from entering teat canal and extended anti-microbial protection, TANUVAS- Masti-Guard for prevention of common mastitis, Ethno-Veterinary Medicine (EVM) for bloat in dairy cattle, Area specific Mineral Mixture in dairy cows, Prophylactic management against hoof rot in cattle, parasite control on dairy farms, Infertility management in cattle exhibiting anoestrus, Automatic drinker assembly, Moringa PKM-1 as fodder, Low cost hydroponic fodder production, Little silage bags and injection

GnRh@100mcgm/animal at the time of first Artificial Insemination followed by second AI at 24 hrs interval in dairy animals and technologies such as Scientific goat farming with pure Malabari goats, Custom made feed for kids and Injection PGF2 α at 11 days apart and fixed time breeding at 72 and 96 hrs in sheep and goat were demonstrated. In poultry, small sized, table top portable automatic incubators, Low cost portable mini poultry brooder with package of practices for backyard poultry rearing, Fish silage supplement in backyard poultry, Nandanam quail III for meat production and Vigoa ducks were demonstrated. Details and results are given in Table 45.

Table 45: Frontline demonstrations on livestock conducted by KVKs of Kerala

Name of the technology demonstrated	Name of KVK	Farmers (No)	Units (No)	Major parameters	Major parameters			Other parameters	Other parameters		Net returns (₹.)	
					Demo	Check	Increase (%)		Demo	Check	Demo	Check
Dairy												
Masti-Guard germicidal teat protect spray for preventing common mastitis bacteria from entering teat canal and extended anti microbial protection	Idukki	5	5	Quantity of milk production (l/lactation)	3381.50	2586.00	24.00	Incidence of Mastitis (%)	0.00	14.00	52237	35750
TANUVAS- Masti-Guard for prevention of common mastitis	Kollam	5	5	Disease incidence (%)	0	20.00	100.00					
Ethno-Veterinary Medicine (EVM) for bloat in dairy cattle	Idukki	5	5	Milk yield (l/cow/lactation)	4175.00	3418.00	18.00	Treatment duration (days)	1.50	3.00	65982	47841
Area specific Mineral Mixture in dairy cows	Pathanamthitta	10	20	Milk yield (l/cow/day)	11.00	6.00	45.45	Panting score to quantify heat stress (in a scale of 0 to 4.5)	0	2 to 3	10608	6919

Prophylactic management against hoof rot in cattle	Trivandrum	25	25	Milk yield (l/cow/day)	12.40	12.00	3.00	Hoof health score	4	3	36575	15063
Integrated parasite control on dairy farms	Trivandrum	40	40	Milk yield (l/cow/day)	12.80	12.00	7.00	Duration of action of drug (No. of days)	21	4	34560	17980
Infertility management in cattle exhibiting anoestrus	Trivandrum	15	15	Conception rate (%)	60.00	33.33	26.70	Services required per conception (No.)	2	4	46800	22750
Automatic drinker assembly	Thrissur	10	10	Average production (l/animal/day)	11.70	10.20	11.00	Decrease in use of water unit/ month	6 times.	3 times	28548	24889
Moringa PKM-1	Thrissur	20	20	Moringa fodder production (kg/day)	0.70	0.20	6.00	Change in fat percentage in milk	not observed		10500	1200
Low cost hydroponic fodder production	Thrissur	1	1	Production (kg/unit)	6.80							
Little bag silage	Thrissur	20	20	Per bag (kg)	4.20							
injection GnRh@100mcg/animal at the time of first Artificial Insemination followed by second AI at 24 hrs interval	Kozhikode	50	50	Conception rate %	49.00	40.00	22.50	Body weight (kg/animal)				
Total		206	216									
Sheep and Goat												
Scientific goat farming with pure Malabari goats	Ernakulam	2	3 nos	Average body weight of kids at 6 months (kg)	10.50	8.00	31.00	Disease incidence (%)	0	20.00	6825	3500
Custom made feed for kids	Thrissur	10	5 units	Weight gain animal/month (kg)	9.00	3.00	45.00	Growth rate, acceptance of feed, digestive problems occurred	feed well accepted; no digestive problems		7300	800
Injection PGF2 α at 11 days apart and fixed time breeding at 72 and 96 hrs	Kozhikode	50	50	Conception rate (%)	48.85	30.00	62.80	Body weight (kg/animal)				
Total		62	58									
Poultry												
Small sized, table top portable automatic incubators	Pathanamthitta	3	3	Hatchability of eggs (%)	70.83	51.66	27.06	Eggs sets (No)	40	10	26200	2000
Low cost portable mini poultry brooder with package of practices for backyard poultry rearing	Kollam	5	5	Mortality during brooding (%)	2.00	12.00	83.30					
Demonstration of Fish Silage Supplement in backyard poultry	Kollam	5	5	Egg production (No./year)	196.00	175.00	12.00	Occurrence cannibalism (%)	0	20.00	4393	3375

Nandanam quail III for meat production	Ernakulam	5	5	Weight at 4 weeks (g)	183.50	131.00	40.00	Mortality (%)	5.40	6.00	2485	1650
Vigoa ducks	Thrissur	25	25	Body weight (kg/bird)	3.00						230	100
Total		43	43									
Grand total		311	317									

3.1.2.17 Fisheries

A total of 66 demonstrations were conducted in case of fisheries during the year by KVKs of Zone-XI. State wise break up includes 33 demonstrations in Karnataka and 30 in Kerala. State and enterprise wise results are given below.

Karnataka

A total of 33 demonstrations in fisheries were conducted by KVKs of Karnataka during the year. Technologies such as Composite fish culture of Catla, Rohu and

Common carp, Composite Fish Culture in IFS plot - Grass carp, Rohu, Silver carp, Monoculture of Tilapia in farm pond, Promotion of inland fisheries in farm pond and Fish culture in storage ponds were demonstrated. Results on its performance are given in Table 46. A total of 66 demonstrations were conducted in case of fisheries during the year by KVKs of Zone-XI. State wise break up includes 33 demonstrations in Karnataka and 30 in Kerala. State and enterprise wise results are given below.

Table 46: Frontline demonstrations on fisheries conducted by KVKs of Karnataka

Name of KVK	Name of the technology	Farmers (No)	Units (No)	Major parameters	Major parameters			Economics of demo (₹.)		Economics of check (₹.)	
					Demo	Check	Change in major parameter (%)	Net return	BCR	Net return	BCR
Dakshina Kannada	Composite fish culture of Catla Rohu and Common carp	3	3	Fish yield (q/ha)	49.9	30.6	63.38	277705	2.88	148751	2.34
Kodagu	Composite Fish Culture in IFS plot - Grass carp, Rohu, Silver carp	7	7	Fish yield (q/ha)	64.85	38.42	68.79	198631	4.46	75648	2.97
Dakshina Kannada	Monoculture of Tilapia in farm pond	3	3	Fish yield (q/ha)	33.13	19.48	70.11	108414	1.69	63073	1.41
Dharwad	Promotion of inland fisheries in farm pond	10	10	Fish yield (q/ha)	80.68	50.65	59.28	335920	3.26	178900	2.43
Vijayapura-I	Fish culture in storage ponds	10	10	Fish yield (q/ha)	60.9	0	0	438100	4.9	0	0
Total		33	33								



Scientific fish rearing in farm pond by KVK Vijayapura-II

Kerala

A total of 33 demonstrations in fisheries were conducted by KVKs of Kerala during the year. Technologies such as Cage culture of finfish in Granite quarry ponds, Fresh water cage fish farming, Nursery rearing and marketing of finfish fingerlings using ponds, Aquaponics in peri urban areas, Gut probiotics combo (marine yeast and *Bacillus cereus sensulato* & *Arthrobacter nicotianae*) isolated from Kerala to enhance growth rate in Tilapia, Demonstration of *Bacillus cereus sensulato* Detrodigest isolated from aquaculture fields of Kerala for improving water quality in

Aquaculture , Demonstration of Asian Seabass (*Lates calcarifer*) seed fattening as a pre-requisite for its growout farming in brackishwater, ICAR-CIBA pellet feed Bhetkiahar on growth performance of Asian seabass farmed in brackish water cages, Scientific farming of milkfish (*Chanos chanos*) in brackishwater ponds with water acidity management, Demonstration of aquaponics farming system and use of carotenoid rich feed for freshwater ornamental fish culture were demonstrated. Results under these technologies are reported in Table 47.

Table 47: Frontline demonstrations on fisheries conducted by KVKs of Kerala

Name of KVK	Name of the technology	Farmers (No)	Units (No)	Major parameters	Major parameters			Economics of demo (₹.)		Economics of check (₹.)	
					Demo	Check	Change (%)	Net return	BCR	Net return	BCR
Pathanamthitta	Cage culture of finfish in granite quarry ponds	3	1	Production rate (kg/m ³)	13.33			4100	1.21		
Pathanamthitta	Fresh water cage fish farming	2	1	Growth rate (g/ 3 months)	200.00						
Kozhikode	Cage culture of pearl spot fish	2	2	-	-	-	-	11875	1.88	-	
Pathanamthitta	Nursery rearing and marketing of finfish fingerlings using ponds	1	1	Size of finger lings (cm)	6.00	nil	NA	13500	1.71	NA	NA
Pathanamthitta	Aquaponics in peri urban areas	1	1	Growth rate (g)	90 gm (13 cm)						
Ernakulam	Gut probiotics combo (marine yeast and <i>Bacillus cereus sensulato</i> & <i>Arthrobacter nicotianae</i>) isolated from Kerala to enhance growth rate in Tilapia	2	2	Growth rate (g)	425.00	375.00	13.33	110	1.79	95	1.60
Ernakulam	Demonstration of <i>Bacillus cereus sensulato</i> "Detrodigest" isolated from aquaculture fields of Kerala for improving water quality in Aquaculture	2	2	Growth rate (g)	325.00	300.00	8.33	70	1.54	50	1.30
Ernakulam	Demonstration of Asian Seabass (<i>Lates Calcarifer</i>) seed fattening as a pre-requisite for its growout farming in brackishwater	2	2	Survival (%)	65.00	40.00	62.50	15	1.60	3	1.10

3.1.3 Capacity Development

During the year under report, 4926 training courses were organized and trained 168429 participants representing farmers, farmwomen, rural youth and extension personnel (Table 48). This includes 3358 training courses for farmers (116628 participants), 503 training

courses for rural youth (17671 participants), 223 training courses for extension personnel (9385 participants), 717 sponsored courses (21867 participants) and 125 vocational training courses (2878 participants). Details are given in Table 48.

Table 48: State/UT and category wise training courses organized by KVKs of Zone-XI

State / UT	Farmers / Farm Women		Rural Youth		Extension personnel		Sponsored Programs		Vocational Programs		Total	
	C	P	C	P	C	P	C	P	C	P	C	P
Karnataka	2328	80197	191	7505	140	6331	524	15400	51	1334	3234	110767
Kerala	1021	36184	312	10166	83	3054	191	6406	71	1509	1678	57319
Lakshadweep	9	247	0	0	0	0	2	61	3	35	14	343
Total	3358	116628	503	17671	223	9385	717	21867	125	2878	4926	168429

C= No. of courses; P= No. of participants

3.1.3.1 Farmers and farmwomen

(a) State/UT wise training courses:

Training courses conducted for farmers and farmwomen by KVKs in state/UT wise are presented in Table 49. Data reveals that 2328 courses were conducted by KVKs of Karnataka for 80197

participants, 1021 courses by KVKs of Kerala (36184 participants) and 9 courses by KVK, Lakshadweep (247 participants). Out of 116628 participants, 24440 (20.96%) were from SC/ST farmers and 36728 (31.49%) were women farmers.

Table 49: State/UT wise training courses conducted for farmers and farmwomen by KVKs of Zone-XI

State/UT	Courses (No.)	Farmers and farm women (No.)								
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	2328	47572	14804	62376	12269	5552	17821	59841	20356	80197
Kerala	1021	16842	12970	29812	3116	3256	6372	19958	16226	36184
Lakshadweep	9	0	0	0	101	146	247	101	146	247
Total	3358	64414	27774	92188	15486	8954	24440	79900	36728	116628

(b) Area wise training courses:

Training courses conducted for farmers/farmwomen on different training areas (Table 50) reveals that crop production was the major area of training with 703 courses and 27190 participants. Training on plant protection (498 courses) and home science/women empowerment (484 courses) were next major

important areas followed by soil health and fertility management (381 courses). More courses were also organized for vegetable crops under horticulture (228 courses). Area wise training courses conducted for farmers and farmwomen by KVKs of Karnataka, Kerala and Lakshadweep are presented in Tables 51, 52 and 53, respectively.

Table 50: Area wise training courses conducted for farmers and farmwomen by KVKs of Zone-XI

Area of training	Courses (No.)	Farmers and farm women (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production	703	17390	4147	21537	4282	1371	5653	21672	5518	27190
Horticulture										
a) Vegetable crops	228	4290	1710	6000	894	421	1315	5184	2131	7315
b) Fruit crops	124	2509	789	3298	543	270	813	3052	1059	4111
c) Ornamental plants	30	505	343	848	101	78	179	606	421	1027
d) Plantation crops	64	1372	407	1779	165	56	221	1537	463	2000
e) Tuber crops	7	74	136	210	5	35	40	79	171	250
f) Spices	49	1278	670	1948	79	35	114	1357	705	2062
g) Medicinal and aromatic plants	7	165	35	200	6	11	17	171	46	217
Soil health and fertility management	381	8627	1735	10362	2321	688	3009	10948	2423	13371
Livestock production and management	360	7232	3375	10607	2292	1183	3475	9524	4558	14082
Home science/women empowerment	484	3249	8485	11734	552	2292	2844	3801	10777	14578
Agriculture Engineering	73	1320	442	1762	377	165	542	1697	607	2304
Plant protection	498	10069	2549	12618	2264	1252	3516	12333	3801	16134
Fisheries	24	377	84	461	76	35	111	453	119	572
Production of inputs at site	177	3102	1311	4413	931	531	1462	4033	1842	5875
Capacity building and group dynamics	117	2315	1293	3608	421	430	851	2736	1723	4459
Agro-forestry	32	540	263	803	177	101	278	717	364	1081
Total	3358	64414	27774	92188	15486	8954	24440	79900	36728	116628

Table 51: Area wise training courses conducted for farmers and farmwomen by KVKs of Karnataka

Area of training	Courses (No.)	Farmers and farm women (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production	578	14771	2418	17189	3803	897	4700	18574	3315	21889
Horticulture										
a) Vegetable crops	135	2599	592	3191	648	190	838	3247	782	4029
b) Fruit crops	93	1893	378	2271	405	186	591	2298	564	2862
c) Ornamental plants	17	255	143	398	54	16	70	309	159	468
d) Plantation crops	44	890	186	1076	139	40	179	1029	226	1255
e) Tuber crops	5	12	127	139	4	32	36	16	159	175
f) Spices	11	221	47	268	39	12	51	260	59	319
g) Medicinal and aromatic plants	7	165	35	200	6	11	17	171	46	217

Soil Health and fertility management	330	7695	1124	8819	1907	425	2332	9602	1549	11151
Livestock production and management	265	4926	1638	6564	1749	687	2436	6675	2325	9000
Home Science/women empowerment	239	1270	4944	6214	345	1310	1655	1615	6254	7869
Agriculture Engineering	30	737	146	883	307	110	417	1044	256	1300
Plant protection	357	8090	1459	9549	1758	923	2681	9848	2382	12230
Fisheries	15	271	31	302	71	31	102	342	62	404
Production of inputs at site	97	2024	603	2627	526	278	804	2550	881	3431
Capacity building and group dynamics	75	1257	716	1973	334	312	646	1591	1028	2619
Agro-forestry	30	496	217	713	174	92	266	670	309	979
Total	2328	47572	14804	62376	12269	5552	17821	59841	20356	80197

Table 52: Area wise training courses conducted for farmers and farmwomen by KVKs of Kerala

Area of training	Courses (No.)	Farmers and farmwomen (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production	120	2619	1729	4348	418	375	793	3037	2104	5141
Horticulture										
a) Vegetable crops	93	1691	1118	2809	246	231	477	1937	1349	3286
b) Fruit crops	31	616	411	1027	138	84	222	754	495	1249
c) Ornamental plants	13	250	200	450	47	62	109	297	262	559
d) Plantation crops	20	482	221	703	26	16	42	508	237	745
e) Tuber crops	2	62	9	71	1	3	4	63	12	75
f) Spices	38	1057	623	1680	40	23	63	1097	646	1743
Soil health and fertility management	49	932	611	1543	406	224	630	1338	835	2173
Livestock production and management	93	2306	1737	4043	511	488	999	2817	2225	5042
Home Science/women empowerment	245	1979	3541	5520	207	982	1189	2186	4523	6709
Agriculture Engineering	43	583	296	879	70	55	125	653	351	1004
Plant protection	141	1979	1090	3069	506	329	835	2485	1419	3904
Fisheries	9	106	53	159	5	4	9	111	57	168
Production of inputs at site	80	1078	708	1786	405	253	658	1483	961	2444
Capacity building and group dynamics	42	1058	577	1635	87	118	205	1145	695	1840
Agro-forestry	2	44	46	90	3	9	12	47	55	102
Total	1021	16842	12970	29812	3116	3256	6372	19958	16226	36184



Method demonstration of release of *Goniozus nephantidis*, at KVK, Davanagere

Method demonstration of soil sample collection at KVK Kalaburgi II

Table 53: Area wise training courses conducted for farmers and farmwomen by KVK, Lakshadweep

Area of training	Courses (No.)	Farmers and farm women (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production	5	0	0	0	61	99	160	61	99	160
Soil health and fertility management	2	0	0	0	8	39	47	8	39	47
Livestock production and management	2	0	0	0	32	8	40	32	8	40
Total	9	0	0	0	101	146	247	101	146	247

3.1.3.2 Rural youth

(a) State wise training courses:

KVKs of Kerala conducted 312 courses for rural youth whereas KVKs of Karnataka conducted 191 courses (Table 54). Nearly 42.17% of the rural youth trained were female, 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 (21.00%) that indicates the capacity building efforts of KVKs are equally valuable in mainstreaming the youth of socially disadvantaged sections.

Table 54: State wise training courses conducted for rural youth by KVKs of Zone-XI

State	Courses (No.)	Rural youth (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	191	3616	2137	5753	1099	653	1752	4715	2790	7505
Kerala	312	4390	3818	8208	1114	844	1958	5504	4662	10166
Total	503	8006	5955	13961	2213	1497	3710	10219	7452	17671

(b) Area wise training courses:

A total of 503 courses were conducted for rural youth (17671 participants) in different areas (Table 55). Topics on organic, family farming, vegetables and coconut cultivation under others category was the major training area with 104 courses (5202 participants) followed by 51 courses on value addition(1574 participants). The relative popularity of value addition reflects the preference of rural youth in areas representing secondary agriculture.

Nursery management of horticultural crops (40 courses, 1494 participants), post harvest technology (35 courses, 910 participants) and bee keeping (30 courses, 922 participants) were the other important training areas for rural youth. Area wise training courses conducted for rural youth by KVKs of Karnataka and Kerala are presented in Tables 56 and 57, respectively.

Table 55: Area wise training courses conducted for rural youth by KVKs of Zone-XI

Area of training	Courses (No.)	Rural youth (No.)								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery management of horticulture crops	40	651	637	1288	119	87	206	770	724	1494
Training and pruning of orchards	4	17	53	70	1	5	6	18	58	76
Protected cultivation of vegetable crops	15	149	194	343	27	39	66	176	233	409
Commercial fruit production	8	165	68	233	25	18	43	190	86	276
Integrated farming	21	523	278	801	101	60	161	624	338	962
Seed production	6	102	17	119	21	2	23	123	19	142
Production of organic inputs	18	258	131	389	68	43	111	326	174	500
Planting material production	7	78	50	128	19	5	24	97	55	152
Vermi-culture	21	413	104	517	86	21	107	499	125	624
Mushroom production	27	170	171	341	54	97	151	224	268	492
Bee-keeping	30	484	262	746	127	49	176	611	311	922
Sericulture	10	102	27	129	25	4	29	127	31	158
Repair and maintenance of farm machinery and implements	15	157	142	299	9	2	11	166	144	310
Value addition	51	366	857	1223	119	232	351	485	1089	1574
Small scale processing	6	87	194	281	7	42	49	94	236	330
Post harvest technology	35	252	489	741	39	130	169	291	619	910
Tailoring and stitching	6	0	106	106	0	15	15	0	121	121
Production of quality animal products	1	12	14	26	2	2	4	14	16	30
Dairying	22	427	76	503	153	86	239	580	162	742
Sheep and goat rearing	18	427	74	501	293	46	339	720	120	840
Quail farming	2	13	11	24	8	14	22	21	25	46
Poultry production	14	195	164	359	126	76	202	321	240	561
Ornamental fisheries	11	396	65	461	31	16	47	427	81	508

Composite fish culture	7	171	29	200	36	12	48	207	41	248
Freshwater prawn culture	1	4	3	7	0	1	1	4	4	8
Shrimp farming	1	4	3	7	1	0	1	5	3	8
Cold water fisheries	2	7	17	24	0	2	2	7	19	26
Any other (Organic, family farming, Vegetables, Coconut cultivation)	104	2376	1719	4095	716	391	1107	3092	2110	5202
Total	503	8006	5955	13961	2213	1497	3710	10219	7452	17671

Table 56: Area wise training courses conducted for rural youth by KVKs of Karnataka

Area of training	Courses (No.)	Rural youth (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery management of horticulture crops	8	125	63	188	35	11	46	160	74	234
Protected cultivation of vegetable crops	2	7	42	49	0	12	12	7	54	61
Commercial fruit production	4	103	8	111	4	5	9	107	13	120
Integrated farming	15	313	87	400	57	28	85	370	115	485
Seed production	5	99	2	101	21	0	21	120	2	122
Production of organic inputs	10	193	65	258	40	29	69	233	94	327
Planting material production	2	38	6	44	12	0	12	50	6	56
Vermi-culture	19	403	90	493	84	20	104	487	110	597
Mushroom production	12	82	104	186	24	63	87	106	167	273
Bee-keeping	11	195	57	252	47	13	60	242	70	312
Sericulture	4	75	0	75	20	0	20	95	0	95
Repair and maintenance of farm machinery and implements	1	16	0	16	6	0	6	22	0	22
Value addition	25	97	499	596	26	140	166	123	639	762
Small scale processing	2	0	145	145	0	38	38	0	183	183
Post harvest technology	1	14	26	40	8	3	11	22	29	51
Tailoring and stitching	3	0	64	64	0	7	7	0	71	71
Production of quality animal products	1	12	14	26	2	2	4	14	16	30
Dairying	18	403	61	464	151	84	235	554	145	699
Sheep and goat rearing	17	416	67	483	290	42	332	706	109	815
Poultry production	7	133	85	218	44	23	67	177	108	285
Composite fish culture	3	40	5	45	32	10	42	72	15	87
Any other (Vegetables, coconut cultivation)	21	852	647	1499	196	123	319	1048	770	1818
Total	191	3616	2137	5753	1099	653	1752	4715	2790	7505



On campus training on processing and value addition for rural youth at KVK Idukki



On campus training on apiculture at KVK Kalaburagi I

Table 57: Area wise training courses conducted for rural youth by KVKs of Kerala

Area of training	Courses (No.)	Rural youth (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery Management of Horticulture crops	32	526	574	1100	84	76	160	610	650	1260
Training and pruning of orchards	4	17	53	70	1	5	6	18	58	76
Protected cultivation of vegetable crops	13	142	152	294	27	27	54	169	179	348
Commercial fruit production	4	62	60	122	21	13	34	83	73	156
Integrated farming	6	210	191	401	44	32	76	254	223	477
Seed production	1	3	15	18	0	2	2	3	17	20
Production of organic inputs	8	65	66	131	28	14	42	93	80	173
Planting material production	5	40	44	84	7	5	12	47	49	96
Vermi-culture	2	10	14	24	2	1	3	12	15	27
Mushroom Production	15	88	67	155	30	34	64	118	101	219
Bee-keeping	19	289	205	494	80	36	116	369	241	610
Sericulture	6	27	27	54	5	4	9	32	31	63
Repair and maintenance of farm machinery and implements	14	141	142	283	3	2	5	144	144	288
Value addition	26	269	358	627	93	92	185	362	450	812
Small scale processing	4	87	49	136	7	4	11	94	53	147
Post Harvest Technology	34	238	463	701	31	127	158	269	590	859
Tailoring and Stitching	3	0	42	42	0	8	8	0	50	50
Dairying	4	24	15	39	2	2	4	26	17	43
Sheep and goat rearing	1	11	7	18	3	4	7	14	11	25
Quail farming	2	13	11	24	8	14	22	21	25	46
Poultry production	7	62	79	141	82	53	135	144	132	276
Ornamental fisheries	11	396	65	461	31	16	47	427	81	508

Composite fish culture	4	131	24	155	4	2	6	135	26	161
Freshwater prawn culture	1	4	3	7	0	1	1	4	4	8
Shrimp farming	1	4	3	7	1	0	1	5	3	8
Cold water fisheries	2	7	17	24	0	2	2	7	19	26
Any other (Vegetables, coconut cultivation)	83	1524	1072	2596	520	268	788	2044	1340	3384
Total	312	4390	3818	8208	1114	844	1958	5504	4662	10166

3.1.3.3 Extension personnel

(a) State wise training courses:

KVKs in Karnataka conducted 140 courses in which 6331 extension personnel participated, whereas KVKs

in Kerala conducted 83 courses for 3054 extension personnel (Table 58).

Table 58: State wise training courses conducted for extension personnel by KVKs of Zone-XI

State	Courses (No.)	Extension personnel (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	140	3816	1158	4974	846	511	1357	4662	1669	6331
Kerala	83	1437	1199	2636	183	235	418	1620	1434	3054
Total	223	5253	2357	7610	1029	746	1775	6282	3103	9385

(b) Area wise training courses:

Data from Table 59 shows that out of 223 courses conducted for 9385 extension personnel, Integrated Pest Management with 39 courses was the major area with the participation of 1594 extension personnel.

Details on area wise training courses conducted for extension personnel by KVKs of Zone-XI, KVKs of Karnataka and KVKs of Kerala are presented in Tables 59, 60 and 61, respectively.

Table 59: Area wise training courses conducted for extension personnel by KVKs of Zone-XI

Area of training	Courses (No.)	Extension personnel (No.)								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	30	739	141	880	96	33	129	835	174	1009
Integrated Pest Management	39	813	389	1202	242	150	392	1055	539	1594
Integrated Nutrient Management	20	748	153	901	93	40	133	841	193	1034
Rejuvenation of old orchards	2	65	10	75	3	0	3	68	10	78
Protected cultivation technology	1	12	9	21	3	3	6	15	12	27
Production and use of organic inputs	4	67	13	80	10	0	10	77	13	90
Care and maintenance of farm machinery and implements	2	24	62	86	0	0	0	24	62	86
Gender mainstreaming through SHGs	1	100	20	120	20	20	40	120	40	160
Formation and management of SHGs	6	66	89	155	8	45	53	74	134	208
Women and child care	12	7	223	230	4	94	98	11	317	328

Low cost and nutrient efficient diet designing	2	10	15	25	10	9	19	20	24	44
Group dynamics and farmers organization	6	131	34	165	9	7	16	140	41	181
Information networking among farmers	2	121	67	188	38	26	64	159	93	252
Capacity building for ICT application	6	184	80	264	29	12	41	213	92	305
Management in farm animals	9	426	115	541	48	19	67	474	134	608
Livestock feed and fodder production	19	651	144	795	279	73	352	930	217	1147
Household food security	5	52	129	181	7	35	42	59	164	223
Any other (organic cultivation, watershed management, innovation in agriculture)	57	1037	664	1701	130	180	310	1167	844	2011
Total	223	5253	2357	7610	1029	746	1775	6282	3103	9385

Table 60: Area wise training courses conducted for extension personnel by KVKs of Karnataka

Area of training	Courses (No.)	Extension personnel (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	22	683	61	744	86	25	111	769	86	855
Integrated Pest Management	26	487	199	686	207	120	327	694	319	1013
Integrated Nutrient Management	13	632	28	660	74	19	93	706	47	753
Rejuvenation of old orchards	2	65	10	75	3	0	3	68	10	78
Production and use of organic inputs	3	58	4	62	10	0	10	68	4	72
Gender mainstreaming through SHGs	1	100	20	120	20	20	40	120	40	160
Formation and management of SHGs	5	26	89	115	8	45	53	34	134	168
Women and child care	10	5	187	192	4	94	98	9	281	290
Low cost and nutrient efficient diet designing	2	10	15	25	10	9	19	20	24	44
Group dynamics and farmers organization	2	51	22	73	2	7	9	53	29	82
Capacity building for ICT application	2	62	26	88	24	10	34	86	36	122
Management in farm animals	5	306	73	379	42	12	54	348	85	433
Livestock feed and fodder production	18	628	137	765	273	67	340	901	204	1105
Household food security	3	38	106	144	7	35	42	45	141	186
Any other (organic cultivation)	26	665	181	846	76	48	124	741	229	970
Total	140	3816	1158	4974	846	511	1357	4662	1669	6331



On campus training programme on nutrition security for women and children at KVK, Chamarajangara

Table 61: Area wise training courses conducted for extension personnel by KVKs of Kerala

Area of training	Courses (No.)	Extension personnel (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	8	56	80	136	10	8	18	66	88	154
Integrated Pest Management	13	326	190	516	35	30	65	361	220	581
Integrated Nutrient Management	7	116	125	241	19	21	40	135	146	281
Protected cultivation technology	1	12	9	21	3	3	6	15	12	27
Production and use of organic inputs	1	9	9	18	0	0	0	9	9	18
Care and maintenance of farm machinery and implements	2	24	62	86	0	0	0	24	62	86
Formation and management of SHGs	1	40	0	40	0	0	0	40	0	40
Women and child care	2	2	36	38	0	0	0	2	36	38
Group dynamics and farmers organization	4	80	12	92	7	0	7	87	12	99
Information networking among farmers	2	121	67	188	38	26	64	159	93	252
Capacity building for ICT application	4	122	54	176	5	2	7	127	56	183
Management in farm animals	4	120	42	162	6	7	13	126	49	175
Livestock feed and fodder production	1	23	7	30	6	6	12	29	13	42
Household food security	2	14	23	37	0	0	0	14	23	37
Any other (organic cultivation)	31	372	483	855	54	132	186	426	615	1041
Total	83	1437	1199	2636	183	235	418	1620	1434	3054

3.1.3.4 Sponsored training courses

(a) State wise sponsored training courses:

KVKs of Zone-XI conducted sponsored training courses which are presented state wise in Table 62. A total of 524 courses were conducted by KVKs of

Karnataka with 15400 participants, followed by 191 courses by KVKs of Kerala with 6406 participants and KVK, Lakshadweep conducted 2 courses with 61 participants.

Table 62: State/UT wise sponsored training courses conducted by KVKs of Zone-XI

State/UT	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	524	9937	2117	12054	2679	667	3346	12616	2784	15400
Kerala	191	2628	2508	5136	577	693	1270	3205	3201	6406
Lakshadweep	2	0	0	0	43	18	61	43	18	61
Total	717	12565	4625	17190	329	1378	4677	15864	6003	21867

(b) Area wise sponsored training courses:

Besides the regular training courses, 717 sponsored training courses were conducted by KVKs of Zone-XI in different areas and trained 21867 participants (Table 63). More number of training courses (190) were conducted on soil health and fertility management with the participation of 7261 farmers/rural

youth/extension functionaries followed by agricultural extension with 183 courses and 1850 participants. Area wise sponsored training courses conducted by KVKs of Karnataka, Kerala and Lakshadweep are presented in Tables 64, 65 and 66, respectively.

Table 63: Area wise sponsored training courses conducted by KVKs of Zone-XI

Area of training	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management	94	1987	675	2662	365	163	528	2352	838	3190
Production and value addition	41	832	361	1193	155	47	202	987	408	1395
Soil health and fertility management	190	5191	322	5513	1549	199	1748	6740	521	7261
Production of inputs at site	9	123	76	199	27	51	78	150	127	277
Methods of protective cultivation	5	124	17	141	28	8	36	152	25	177
Others (IPDM)	37	910	383	1293	197	116	313	1107	499	1606
Post harvest technology and value addition	51	818	924	1742	155	357	512	973	1281	2254
Farm machinery	26	252	137	389	43	26	69	295	163	458
Livestock and fisheries	1	13	2	15	4	1	5	17	3	20
Livestock production and management	48	1032	620	1652	450	131	581	1482	751	2233
Home Science	32	177	645	822	174	150	324	351	795	1146
Agricultural Extension	183	1106	463	1569	152	129	281	1258	592	1850
Total	717	12565	4625	17190	3299	1378	4677	15864	6003	21867

Table 64: Area wise sponsored training courses conducted by KVKs of Karnataka

Area of training	Courses (No.)	No. of Participants								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management	63	1336	290	1626	284	89	373	1620	379	1999
Production and value addition	20	637	34	671	76	3	79	713	37	750
Soil health and fertility management	181	5009	156	5165	1506	127	1633	6515	283	6798
Production of Inputs at site	5	117	28	145	23	26	49	140	54	194
Methods of protective cultivation	2	35	9	44	16	4	20	51	13	64
Others (IPDM)	21	611	177	788	99	41	140	710	218	928
Post harvest technology and value addition	14	325	309	634	55	120	175	380	429	809
Farm machinery	4	83	46	129	17	5	22	100	51	151
Livestock and fisheries	1	13	2	15	4	1	5	17	3	20
Livestock production and management	33	811	444	1255	328	41	369	1139	485	1624
Home Science	22	141	494	635	168	118	286	309	612	921
Agricultural Extension	158	819	128	947	103	92	195	922	220	1142
Total	524	9937	2117	12054	2679	667	3346	12616	2784	15400

Table 65: Area wise sponsored training courses conducted by KVKs of Kerala

Area of training	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management	31	651	385	1036	81	74	155	732	459	1191
Production and value addition	21	195	327	522	79	44	123	274	371	645
Soil health and fertility management	9	182	166	348	43	72	115	225	238	463
Production of Inputs at site	4	6	48	54	4	25	29	10	73	83
Methods of protective cultivation	3	89	8	97	12	4	16	101	12	113
Others (IPDM)	16	299	206	505	98	75	173	397	281	678
Post harvest technology and value addition	37	493	615	1108	100	237	337	593	852	1445
Farm machinery	22	169	91	260	26	21	47	195	112	307
Livestock production and management	13	221	176	397	79	72	151	300	248	548
Home Science	10	36	151	187	6	32	38	42	183	225
Agricultural Extension	25	287	335	622	49	37	86	336	372	708
Total	191	2628	2508	5136	577	693	1270	3205	3201	6406

Table 66: Area wise sponsored training courses conducted by KVK, Lakshadweep

Area of training	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Livestock production and management	2	0	0	0	43	18	61	43	18	61



Sponsored training on sheep and goat farming as a economic security at KVK, Dharwad



Training on spawn production at KVK Ernakulam

3.1.3.5 Vocational training courses

(a) State wise vocational training courses:

KVKs of Zone-XI conducted vocational training courses which are presented state/UT wise in Table 67. KVKs of Kerala conducted 71 vocational training courses with 1509 participants followed by KVKs of Karnataka (51 courses with 1334 participants) and

KVK, Lakshadweep (3 courses with 35 participants). Out of the total of 2878 participants, 466 represented from SC/ST category (16.39 %). Extent of female participation was high in Kerala (46.26%) which is noteworthy.

Table 67: State/UT wise vocational training courses conducted by KVKs of Zone-XI

State/UT	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	51	719	356	1075	171	88	259	890	444	1334
Kerala	71	704	598	1302	107	100	207	811	698	1509
Lakshadweep	3	0	0	0	0	35	35	0	35	35
Total	125	1423	954	2377	278	223	501	1701	1177	2878

(b) Area wise vocational training courses:

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 125 training courses were conducted during the year involving 2878 budding entrepreneurs. Among the different vocations, integrated crop management was the major

area of training with 24 courses with 538 participants. Details of area wise vocational training courses conducted by KVKs of Zone-XI, KVKs of Karnataka, KVKs of Kerala and KVK, Lakshadweep are presented in Tables 68, 69, 70 and 71, respectively.

Table 68: Area wise vocational training courses conducted by KVKs of Zone -XI

Area of training	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management										
Commercial floriculture	8	65	88	153	5	10	15	70	98	168
Commercial fruit production	3	27	43	70	3	2	5	30	45	75
Commercial vegetable production	1	6	15	21	2	7	9	8	22	30
Integrated crop management	24	318	130	448	61	29	90	379	159	538
Organic farming	6	95	27	122	31	12	43	126	39	165
Others	10	42	18	60	9	10	19	51	28	79
Post harvest technology and value addition										
Value addition	7	53	45	98	6	51	22	59	61	155
Others	2	39	10	49	6	0	6	45	10	55
Livestock and fisheries										
Dairy farming	6	86	51	137	19	20	39	105	71	176
Composite fish culture	0	0	0	0	0	0	0	0	0	0
Sheep and goat rearing	5	241	12	253	53	3	56	294	15	309
Piggery	0	0	0	0	0	0	0	0	0	0
Poultry farming	3	35	23	58	19	8	27	54	31	85
Others	7	53	24	77	12	11	23	65	35	100
Income generation activities										
Vermi-composting	2	53	1	54	10	0	10	63	1	64
Production of bio-agents, bio-pesticides, bio-fertilizers etc.	1	0	11	11	0	0	0	0	11	11
Repair and maintenance of farm machinery and implements	1	16	12	28	0	0	0	16	12	28
Rural crafts	0	0	0	0	0	0	0	0	0	0
Seed production	0	0	0	0	0	0	0	0	0	0
Sericulture	1	0	17	17	0	3	3	0	20	20
Mushroom cultivation	7	51	57	108	6	14	20	57	71	128
Nursery, grafting etc.	9	78	67	145	22	16	38	100	83	183
Tailoring, stitching, embroidery, dying etc.	6	0	136	136	0	12	12	0	148	148
Agril. para-workers, para-vet training	0	0	0	0	0	0	0	0	0	0
Others	5	45	40	85	3	7	10	48	47	95
Agricultural Extension										
Capacity building and group dynamics	4	29	35	64	8	8	16	37	43	80
Others (pl. specify)	7	91	92	183	3	0	3	94	92	186
Total	125	1423	954	2377	278	223	466	1701	1142	2878

Table 69: Area wise vocational training courses conducted by KVKs of Karnataka

Area of training	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management										
Integrated crop management	6	75	9	84	24	5	29	99	14	113
Organic farming	4	75	12	87	17	7	24	92	19	111
Others	9	42	15	57	9	6	15	51	21	72
Post harvest technology and value addition										
Value addition	1	0	24	24	0	10	10	0	34	34
Dairy farming	6	86	51	137	19	20	39	105	71	176
Sheep and goat rearing	5	241	12	253	53	3	56	294	15	309
Poultry farming	2	32	18	50	17	5	22	49	23	72
Others	2	32	4	36	6	3	9	38	7	45
Income generation activities										
Vermi-composting	2	53	1	54	10	0	10	63	1	64
Sericulture	1	0	17	17	0	3	3	0	20	20
Mushroom cultivation	2	14	27	41	4	9	13	18	36	54
Nursery and grafting	1	15	2	17	9	0	9	24	2	26
Tailoring, stitching, embroidery and dyeing	6	0	136	136	0	12	12	0	148	148
Others	2	17	28	45	0	5	5	17	33	50
Agricultural Extension										
Others	2	37	0	37	3	0	3	40	0	40
Total	51	719	356	1075	171	88	259	890	444	1334

Table 70: Area wise vocational training courses conducted by KVKs of Kerala

Area of training	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production and management										
Commercial floriculture	8	65	88	153	5	10	15	70	98	168
Commercial fruit production	3	27	43	70	3	2	5	30	45	75
Commercial vegetable production	1	6	15	21	2	7	9	8	22	30
Integrated crop management	18	243	121	364	37	24	61	280	145	425
Organic farming	2	20	15	35	14	5	19	34	20	54
Others	1	0	3	3	0	4	4	0	7	7
Post harvest technology and value addition										
Value addition	3	53	21	74	6	6	12	59	27	86
Others	2	39	10	49	6	0	6	45	10	55

Livestock and fisheries										
Poultry farming	1	3	5	8	2	3	5	5	8	13
Others	5	21	20	41	6	8	14	27	28	55
Income generation activities										
Production of bio-agents and bio-pesticides	1	0	11	11	0	0	0	0	11	11
Repair and maintenance of farm machinery	1	16	12	28	0	0	0	16	12	28
Mushroom cultivation	5	37	30	67	2	5	7	39	35	74
Nursery and grafting	8	63	65	128	13	16	29	76	81	157
Others	3	28	12	40	3	2	5	31	14	45
Agricultural Extension										
Capacity building and group dynamics	4	29	35	64	8	8	16	37	43	80
Others	5	54	92	146	0	0	0	54	92	146
Total	71	704	598	1302	107	100	207	811	698	1509



Vocational training on operation and maintenance of farm machineries at KVK, Idukki



Training on arecanut tree climbing at KVK, Chikkamagaluru

Table 71: Area wise vocational training courses conducted by KVK, Lakshadweep

Area of training	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Post harvest technology and value addition										
Value addition	3	0	0	0	0	35	35	0	35	35
Total	3	0	0	0	0	35	35	0	35	35

3.1.3.6 On and off campus training courses

3.1.3.1 State wise on campus and off campus training courses conducted by KVKs of Zone-XI under different

categories of participants are furnished in Tables 72 and 73, respectively.

Table 72: State/UT wise on campus training courses conducted by KVKs of Zone-XI under different categories of participants

State/UT	Courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
(i) Farmers and farm women										
Karnataka	1124	21575	7855	29430	6160	3106	9266	27735	10961	38696
Kerala	489	6995	5352	12347	1358	1495	2853	8353	6847	15200
Lakshadweep	9	0	0	0	101	146	247	101	146	247
Total	1622	28570	13207	41777	7619	4747	12366	36189	17954	54143
(ii) Rural youth										
Karnataka	127	2192	942	3134	547	322	869	2739	1264	4003
Kerala	248	3108	2707	5815	802	602	1404	3910	3309	7219
Total	375	5300	3649	8949	1349	924	2273	6649	4573	11222
(iii) Extension personnel										
Karnataka	84	2140	759	2899	507	275	782	2647	1034	3681
Kerala	45	466	483	949	63	118	181	529	601	1130
Total	129	2606	1242	3848	570	393	963	3176	1635	4811
(iv) Sponsored training courses										
Karnataka	524	9937	2117	12054	2679	667	3346	12616	2784	15400
Kerala	191	2628	2508	5136	577	693	1270	3205	3201	6406
Lakshadweep	2	0	0	0	43	18	61	43	18	61
Total	717	12565	4625	17190	3299	1378	4677	15864	6003	21867
(v) Vocational training courses										
Karnataka	51	719	356	1075	171	88	259	890	444	1334
Kerala	71	704	598	1302	107	100	207	811	698	1509
Lakshadweep	3	0	0	0	0	35	35	0	35	35
Total	125	1423	954	2377	278	223	501	1701	1177	2878
(vi) Zone Total										
Karnataka	1910	36563	12029	48592	10064	4458	14522	46627	16487	63114
Kerala	1044	13901	11648	25549	2907	3008	5915	16808	14656	31464
Lakshadweep	14	0	0	0	144	199	343	144	199	343
Grand total	2968	50464	23677	74141	13115	7665	20780	63579	31342	94921

Table 73: State wise off campus training courses conducted by KVKs of Zone-XI under different categories of participants

Program/State/UT	Courses (No.)	General participants			SC/ST participants			Total participants		
		M	F	T	M	F	T	M	F	T
(i) Farmers and farm women										
Karnataka	1204	25997	6949	32946	6109	2446	8555	32106	9395	41501
Kerala	532	9847	7618	17465	1758	1761	3519	11605	9379	20984
Total	1736	35844	14567	50411	7867	4207	12074	43711	18774	62485
(ii) Rural Youth										
Karnataka	64	1424	1195	2619	552	331	883	1976	1526	3502
Kerala	64	1282	1111	2393	312	242	554	1594	1353	2947
Total	128	2706	2306	5012	864	573	1437	3570	2879	6449
(iii) Extensionpersonnel										
Karnataka	56	1676	399	2075	339	236	575	2015	635	2650
Kerala	38	971	716	1687	120	117	237	1091	833	1924
Total	94	2647	1115	3762	459	353	812	3106	1468	4574
(iv) Zone Total										
Karnataka	1324	29097	8543	37640	7000	3013	10013	36097	11556	47653
Kerala	634	12100	9445	21545	2190	2120	4310	14290	11565	25855
Grand total	1958	41197	17988	59185	9190	5133	14323	50387	23121	73508

3.1.4 Frontline Extension Activities

Extension activities were carried out by 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 74. A total of 92980 extension activities were carried out by KVKs in the Zone through different methods and means wherein 1968484 general farmers, 296554 SC/ST farmers and 105191 extension personnel participated.

State wise data shows that 57161 extension activities were carried out by 33 KVKs of Karnataka with the participation of total of 1734568 farmers which included 1530153 general farmers, 204415 SC/ST farmers besides 90630 extension personnel. In Kerala,, 14 KVKs conducted 35341 activities with the participation of 89042 farmers which included 438331 general farmers and 89042 SC/ST farmers, besides 14464 extension personnel. In Lakshadweep, 478 activities were conducted with the participation of 3097 SC/ST farmers and 97 extension personnel.

Table 74: Extension activities carried out by KVKs of Zone-XI

States	Programmes (No.)	Farmers (No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Karnataka	57161	1135947	394206	1530153	145134	59281	204415	1734568	71619	19011	90630
Kerala	35341	247328	191003	438331	41471	47568	89042	527373	8207	6257	14464
Lakshadweep	478	0	0	0	1744	1353	3097	3097	57	40	97
Total	92980	1383275	585209	1968484	188349	108202	296554	2265038	79883	25308	105191

(b) Activity wise:

Extension activities carried out by KVKs of Karnataka, Kerala and Lakshadweep for the Zone are presented in Table 75, 76 and 77, respectively. KVKs of Karnataka (Table 75) carried out 24335 advisory services, KVKs of Kerala (Table 76) organized 17006 advisory services and KVK, Lakshadweep (Table 77)

organized 150 advisory services. The corresponding data for farmers visits to KVKs was 22223 in Karnataka, 14512 in Kerala and 125 in Lakshadweep. Scientists visit to farmers fields were 4625 in Karnataka, 1714 in Kerala and 122 in Lakshadweep.

Data in Table 78 is for the Zone as a whole, wherein a total of 41491 advisory services, 36860 farmers visit to KVKs and 6461 scientists visits to farmers fields were the outreach activities carried out during the year. Besides 2088 lectures delivered as resource persons, KVKs were involved in 1521 diagnostic visits, 1099 method demonstrations, 508 celebration of important days, 434 film shows, 313 field days, 263 exposure visits, 210 plant health campaigns, 204 exhibitions, 169

farmers seminars, 168 soil health camps, 110 kisan ghosthies, 93 workshops, 86 animal health camps, 80 kisan melas, 74 SHG conveners meetings, 31 ex-trainees sammelan, 9 mahila mandals conveners meetings and 7 farm science club conveners meet. All these activities put together involved 1968484 farmers belonging to general category, 296554 SC/ST farmers and 105191 extension personnel.

Table 75: Extension activities carried out by KVKs of Karnataka

Activities	Programmes (No.)	Farmers (No.)						Extension personnel (No.)		
		General			SC/ST			Male	Female	Total
		Male	Female	Total	Male	Female	Total			
Advisory services	24335	40209	7409	47618	5869	2067	7936	4531	1166	5697
Farmers visit to KVK	22223	69368	12404	81772	10266	4102	14368	1958	671	2629
Scientists visit to farmers fields	4625	14018	2620	16638	2179	826	3005	1233	304	1537
Lectures delivered as resource persons	1803	78825	22555	101380	11573	5515	17088	7298	2349	9647
Diagnostic visits	987	3943	819	4762	607	150	757	848	274	1122
Method demonstrations	659	7932	2500	10432	1886	722	2608	940	294	1234
Group meetings	498	6512	2040	8552	1565	614	2179	868	226	1094
Celebration of important days	386	19556	9889	29445	4579	2542	7121	3275	1101	4376
Film shows	346	10967	3091	14058	2619	928	3547	617	161	778
Field days	234	7381	1560	8941	2034	600	2634	612	212	824
Plant health campaigns	205	10746	559	11305	1025	195	1220	138	79	217
Exposure visits	176	3662	1060	4722	563	219	782	406	76	482
Exhibitions	127	348740	95763	444503	34765	14826	49591	25633	6635	32268
Soil health camps	121	3032	482	3514	673	153	826	313	67	380
Kisan ghosthies	90	10694	2506	13200	2024	775	2799	714	253	967
Farmers seminars	89	3271	1518	4789	1026	444	1470	435	207	642
Animal health camps	70	2698	411	3109	483	223	706	139	43	182
Workshops	67	2681	320	3001	582	129	711	660	241	901

Kisan melas	64	491461	225849	717310	60740	23956	84696	20957	4586	25543
Self Help Group conveners meetings	41	57	669	726	54	236	290	37	46	83
Mahila mandals Conveners meetings	9	0	143	143	0	46	46	0	14	14
Ex-trainees sammelan	4	125	22	147	10	8	18	6	5	11
Farm science club conveners meet	2	69	17	86	12	5	17	1	1	2
Total	57161	1135947	394206	1530153	145134	59281	204415	71619	19011	90630

Table 76: Extension activities carried out by KVKs of Kerala

Activities	Programmes (No.)	Farmers (No.)						Extension personnel (No.)		
		General			SC/ST			Male	Female	Total
		Male	Female	Total	Male	Female	Total			
Advisory services	17006	10819	6130	16949	1957	1175	3132	554	502	1056
Farmers visit to KVK	14512	27830	14621	42451	3032	1777	4809	1181	494	1675
Scientists visit to farmers field	1714	3728	1581	5309	487	410	897	206	250	456
Diagnostic visits	472	1543	845	2388	355	254	609	208	110	318
Method demonstrations	437	3843	2415	6258	492	331	823	213	236	449
Lectures delivered as resource persons	282	5600	3658	9258	824	599	1423	413	376	789
Group meetings	203	3884	3109	6993	225	418	643	190	196	386
Celebration of important days	119	3606	2777	6383	732	503	1235	344	313	657
Film shows	88	1150	867	2017	92	230	322	19	32	51
Exposure visits	86	721	501	1222	215	155	370	54	45	99
Farmers seminars	80	4242	2538	6780	942	558	1500	153	117	270
Field days	79	1062	540	1602	152	10206	10358	76	63	139
Exhibitions	76	145752	134079	279831	17764	11003	28767	2910	2934	5844
Soil health camps	45	1113	589	1702	192	122	314	24	37	61
Self Help Group conveners meetings	31	170	266	436	23	44	67	5	12	17
Ex-trainees sammelan	27	343	165	508	35	52	90	11	14	25

Workshops	26	540	288	828	131	127	258	13	15	28
Kisan ghosthies	20	753	249	1002	66	13709	13775	15	21	36
Animal health camp	15	245	168	413	32	41	73	26	10	36
Kisan melas	15	30201	15558	45759	13696	5825	19521	1583	475	2058
Farm science club conveners meet	5	130	27	157	7	17	24	5	2	7
Plant health camps	3	53	32	85	20	12	32	4	3	7
Total	35341	247328	191003	438331	41471	47568	89042	8207	6257	14464

Table 77: Extension activities carried out by KVK, Lakshadweep

Activities	Programmes (No.)	Farmers (No.)						Extension personnel (No.)		
		General			SC/ST			Male	Female	Total
		Male	Female	Total	Male	Female	Total			
Advisory services	150	0	0	0	100	50	150	0	0	0
Farmers visit to KVK	125	0	0	0	90	35	125	0	0	0
Scientists visit to farmers fields	122	0	0	0	80	42	122	0	0	0
Diagnostic visits	62	0	0	0	50	12	62	0	0	0
Method demonstrations	3	0	0	0	55	35	90	8	3	11
Lectures delivered as resource persons	3	0	0	0	35	27	62	5	3	8
Celebration of important days	3	0	0	0	253	282	535	13	8	21
Soil health camps	2	0	0	0	45	20	65	0	0	0
Plant health campaigns	2	0	0	0	35	15	50	0	0	0
Self Help Group Conveners meetings	2	0	0	0	0	70	70	0	0	0
Kisan melas	1	0	0	0	551	400	951	15	12	27
Exhibitions	1	0	0	0	400	350	750	16	14	30
Exposure visits	1	0	0	0	20	5	25	0	0	0
Animal health camps	1	0	0	0	30	10	40	0	0	0
Total	478	0	0	0	1744	1353	3097	57	40	97

Table 78: Extension activities carried out by KVKs of Zone-XI

Activities	Programmes (No.)	Farmers (No.)						Extension personnel (No.)		
		General			SC/ST			Male	Female	Total
		Male	Female	Total	Male	Female	Total			
Advisory services	41491	51028	13539	64567	7926	3292	11218	5085	1668	6753
Farmers visit to KVK	36860	97198	27025	124223	13388	5914	19302	3139	1165	4304
Scientists visit to farmers field	6461	17746	4201	21947	2746	1278	4024	1439	554	1993
Lectures delivered as resource persons	2088	84425	26213	110638	12432	6141	18573	7716	2728	10444
Diagnostic visits	1521	5486	1664	7150	1012	416	1428	1056	384	1440
Method demonstrations	1099	11775	4915	16690	2433	1088	3521	1161	533	1694
Group meetings	701	10396	5149	15545	1790	1032	2822	1058	422	1480
Celebration of important days	508	23162	12666	35828	5564	3327	8891	3632	1422	5054
Film shows	434	12117	3958	16075	2711	1158	3869	636	193	829
Field days	313	8443	2100	10543	2186	10806	12992	688	275	963
Exposure visits	263	4383	1561	5944	798	379	1177	460	121	581
Plant health campaigns	210	10799	591	11390	1080	222	1302	142	82	224
Exhibitions	204	494492	229842	724334	52929	26179	79108	28559	9583	38142
Farmers seminars	169	7513	4056	11569	1968	1002	2970	588	324	912
Soil health camps	168	4145	1071	5216	910	295	1205	337	104	441
Kisan ghosties	110	11447	2755	14202	2090	14484	16574	729	274	1003
Workshops	93	3221	608	3829	713	256	969	673	256	929
Animal health camps	86	2943	579	3522	545	274	819	165	53	218
Kisan melas	80	521662	241407	763069	74987	30181	105168	22555	5073	27628
Self Help Group conveners meetings	74	227	935	1162	77	350	427	42	58	100
Ex-trainees sammelan	31	468	187	655	45	60	108	17	19	36
Mahila mandals Conveners meetings	9	0	143	143	0	46	46	0	14	14
Farm science club conveners meet	7	199	44	243	19	22	41	6	3	9
	92980	1383275	585209	1968484	188349	108202	296554	79883	25308	105191

(c) Mass contact:

Extension activities carried out for mass contact by KVKs of Zone XI are presented in Table 79. State wise analysis of data indicates that newspaper coverage and providing extension literature were major activities in both Karnataka and Kerala. Zonal pooled data shows that KVKs carried out 3900 extension activities of mass contact of which large number of activities were covered through 1693 news items published in local and national dailies. KVK scientists published 896 extension literature, 368 popular articles and 162 research papers/abstracts during the year. KVKs also participated in radio talks (296), Exhibitions (204), TV

talks (163) and Kisan melas (80) as well as produced 38 CDs/DVDs on different technologies and events. 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 wherein farmers, extension personnel and other stakeholders took part. Further, KVKs were effectively used Mobile Apps, Social media groups, Facebook and Instagram for reaching farmers and other stakeholders.

Table 79 : Extension activities carried out for mass contact by KVKs in Zone -XI

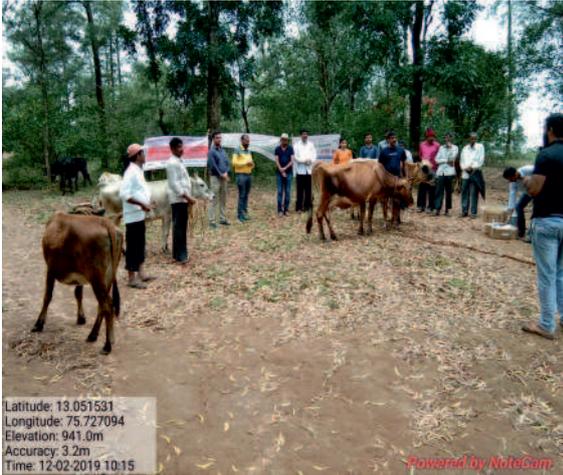
Activity/Media type	Extension activities for mass contact (No.)			
	Karnataka	Kerala	Lakshadweep	Total
CD/DVD	30	8	0	38
Exhibitions	127	76	1	204
Extension Literature	526	368	2	896
Kisan melas	64	15	1	80
Newspaper coverage	1071	620	2	1693
Popular articles	289	79	0	368
Radio talks	235	54	7	296
Research papers/Abstract	137	25	0	162
TV talks	131	32	0	163
Total	2610	1277	13	3900



World soil day celebration at KVK, Tumakuru-I



Field day on ICM in drill sown paddy in Halligeri at KVK, Dharwad



Animal health camp at KVK, Chikkamagalur



Exhibition during krishi mela at UAS, Raichur at KVK, Kalaburagi-II



Field day on IPM of leaf folder in mulberry in Kadudevandahalli at KVK, Kolar



Field day on DSR in Yadaganahalli at KVK, Mandya



Interstate farmers visit to KVK farm at KVK, Pathanamthitta



Exhibition during krishimela-2019 at UAHS, Shivamogga at KVK, Shivamogga

3.1.5 Production of Technological Inputs

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

(a) Seeds:

State wise details pertaining to seed production by KVKs is presented in Table 80. Data indicates that KVKs of XI produced a total of 2478.98 q of seeds of different crops. KVKs of Karnataka produced 2358.83 q and KVKs of Kerala produced 120.15 q and supplied to 56424 farmers. KVKs of Karnataka produced more

seeds of cereals (1428.78 q) followed by vegetables (295.98 q), pulses (235.78 q), oilseeds (220.14 q), millets (115.84 q), spices (43.25 q), fodder (13.25 q) and green manure (5.81 q) and supplied to 7864 farmers (Table 81). Whereas KVKs of Kerala produced more seeds of vegetables (46.82 q) followed by cereals (43.10 q), spices (19.94 q), tubers (8.28 q), pulses (1.80 q) and oilseeds (0.22 q) and supplied to 48560 farmers (Table 82). Data in Table 83 shows that KVKs of Zone-XI produced more quantity of seeds on cereals (1471.88 q) followed by vegetables (342.79 q), pulses (237.58 q), oilseeds (220.36 q), millets (115.84 q), spices (63.19 q), fodder (13.25 q), tubers (8.28 q) and green manure (5.81 q).

Table 80: State wise production of seeds by KVKs of Zone-XI

State	Production of seeds		
	Quantity (q)	Worth (₹)	Farmers (No.)
Karnataka	2358.83	11652935	7864
Kerala	120.15	3438974	48560
Total	2478.98	15091909	56424

Table 81: Crop category wise production of seeds by KVKs of Karnataka

Crop category	Production of seeds		
	Quantity (q)	Worth (₹)	Farmers (No.)
Cereals	1428.78	3046680	1380
Vegetables	295.98	3110325	1094
Pulses	235.78	1879160	2161
Oilseeds	220.14	2206506	920
Millets	115.84	466445	828
Spices	43.25	216250	610
Fodder	13.25	696241	614
Green manure	5.81	31328	257
Total	2358.83	11652935	7864

Table 82: Crop category wise production of seeds by KVKs of Kerala

Crop category	Production of seeds		
	Quantity (q)	Worth (₹)	Farmers (No.)
Vegetables	46.82	3052011	47859
Cereals	43.10	105020	272
Spices	19.94	123215	314
Tubers	8.28	9918	95
Pulses	1.80	143310	18
Oilseeds	0.22	5500	2
Total	120.15	3438974	48560

Table 83: Crop category wise production of seeds by KVKs of Zone-XI

Crop category	Production of seeds		
	Quantity (q)	Worth (₹)	Farmers (No.)
Cereals	1471.88	3151700	1652
Vegetables	342.79	6162336	48953
Pulses	237.58	2022470	2179
Oilseeds	220.36	2212006	922
Millets	115.84	466445	828
Spices	63.19	339465	924
Fodder	13.25	696241	614
Tubers	8.28	9918	95
Green manure	5.81	31328	257
Total	2478.98	15091909	56424

(b) Planting material:

State wise details pertaining to production of planting material by KVKs is presented in Table 84. Data indicates that KVKs of Zone XI produced a total of 2333401 number of plants of different crops of which KVKs of Karnataka produced 1349205 plants and KVKs of Kerala produced 984196 plants and supplied to 61243 farmers.

KVKs of Karnataka produced more number of fodder planting material (779539) followed by vegetables (280763), fruits (131098), plantation (87460), spices (54987), commercial (9508), forest species (3634), medicinal and aromatic (901), flowers (694) and ornamental plants (621) and provided to 15861 farmers (Table 85). Whereas, KVKs of Kerala

produced more number of spices planting material (508085) followed by vegetables (280871), plantation (76588), fruits (59828), fodder (43253), ornamental plants (8446), forest species (2867), flowers (2699) and medicinal and aromatic (1559) and provided to 45382 farmers (Table 86). Data in Table 87 shows that KVKs of Zone XI were produced more quantity of planting material on fodder (822792) followed by spices (563072), vegetables (561634), fruits (190926), plantation (164048), commercial (9508), ornamental (9067), forest species (6501), flowers (3393) and medicinal and aromatic (2460) and provided to 61243 farmers.

Table 84: State wise production of planting material by KVKs of Zone-XI

State	Production of planting material		
	Quantity (No.)	Worth (₹.)	Farmers (No.)
Karnataka	1349205	7285925	15861
Kerala	984196	13258455	45382
Total	2333401	20544380	61243

Table 85: Crop category wise production of planting material by KVKs of Karnataka

Crop category	Production of planting material		
	Quantity (No.)	Worth (₹.)	Farmers (No.)
Fodder	779539	784664	9814
Vegetables	280763	989657	1065
Fruits	131098	1737605	1448
Plantation	87460	2451881	1735
Spices	54987	1161341	1326
Commercial	9508	38032	9
Forest Species	3634	74605	74
Medicinal and aromatic	901	13065	85
Flowers	694	19825	190
Ornamental plants	621	15250	115
Total	1349205	7285925	15861

Table 86: Crop category wise production of planting material by KVKs of Kerala

Crop category	Production of planting material		
	Quantity (No.)	Worth (₹.)	Farmers (No.)
Spices	508085	7834038	11085
Vegetables	280871	782055	14217
Plantation	76588	1850270	1121
Fruits	59828	2431902	11697
Fodder	43253	43253	331
Ornamental plants	8446	198170	5753
Forest Species	2867	50425	447
Flowers	2699	28357	328
Medicinal and aromatic	1559	39985	403
Total	984196	13258455	45382

Table 87: Crop category wise production of planting material by KVKs of Zone-XI

Crop category	Production of planting material		
	Quantity (No.)	Worth (₹.)	Farmers (No.)
Fodder	822792	827917	10145
Spices	563072	8995379	12411
Vegetables	561634	1771712	15282
Fruits	190926	4169507	13145
Plantation	164048	4302151	2856
Commercial	9508	38032	9
Ornamental	9067	213420	5868
Forest species	6501	125030	521
Flowers	3393	48182	518
Medicinal and aromatic	2460	53050	488
Total	2333401	20544380	61243

(c) Hybrids:

State and crop wise details pertaining to production of planting material of hybrids by KVKs is presented in Table 88. Data indicates that KVKs produced 376001 number of hybrid planting material of which KVKs of Karnataka produced 276693 and KVKs of Kerala produced 99308. Further, KVKs of Karnataka produced more number of hybrid planting material of vegetables (189000) followed by flowers (78000) and fruits (9693)

and provided to 876 farmers. Whereas, KVKs of Kerala produced seedlings on vegetables (98190) and fruits (1118) and provided to 4754 farmers. Thus, KVKs in Zone XI as a whole produced more number of hybrid planting material on vegetables (287190) followed by flowers (78000) and fruits (10811) and provided to 5630 farmers.

Table 88: State and crop category wise production of hybrid planting material by KVKs of Zone-XI

State	Crop category	Production of hybrid planting material		
		Quantity (No.)	Worth (₹.)	Farmers (No.)
Karnataka	Vegetables	189000	339350	384
	Flowers	78000	246000	350
	Fruits	9693	146010	142
Total		276693	731360	876
Kerala	Vegetables	98190	285022	4623
	Fruits	1118	45540	131
Total		99308	330562	4754
Grand total		376001	1061922	5630

(d) Bio-products:

State and category wise details pertaining to production of bio-products by KVKs of Zone XI is presented in Table 89. KVKs of Zone XI produced a total of 3244.27 q of bio-products of which KVKs of Karnataka produced 1302.01 q and KVKs of Kerala produced 1942.26 q. Further, KVKs of Karnataka produced more of micro nutrient mixtures (451.53 q) followed by bio-fertilizers (404.28 q), organic manures (260.85 q), bio-pesticides (134.19 q), bio-fungicides (41.89 q), bio agents (8.26 q) and mushroom spawn (1.01 q) and

provided to 16146 farmers. Whereas, KVKs of Kerala produced more of bio-fungicides (509.76 q) followed by micro nutrient mixtures (442.98 q), organic manures (413.51 q), bio-pesticides(326.57 q), biofertilizers (217.98 q), bio-agents (22.21 q), mushroom spawn (9.25 q) and provided to 73237 farmers. Overall KVKs of Zone XI produced largest quantity of micro nutrient mixtures (894.51 q) followed by organic manures (674.36 q), biofertilizers (622.26 q), bio-fungicides (551.65 q),

bio-pesticides (460.76 q), bio-agents (30.47 q), mushroom spawn (10.26 q) and provided to 89383 farmers. Further, KVKs produced 227389 number of other bio-products of which KVKs in Karnataka produced 16507 and KVKs in Kerala produced 210882 and provided to 13090 farmers. KVKs of Karnataka

produced 16318 pheromone traps and 189 tricho cards. Whereas, KVKs in Kerala produced 14948 pheromone trap sand 195934 number of EPN. Thus, KVKs in Zone XI as a whole produced 31266 pheromone traps.

Table 89: State and category wise production of bio-products by KVKs of Zone-XI

Bio-products category	Production of bio-products								
	Karnataka			Kerala			Total		
	Quantity (q)	Worth (₹.)	Farmers (No.)	Quantity (q)	Worth (₹.)	Farmers (No.)	Quantity (q)	Worth (₹.)	Farmers (No.)
Bio agents	8.26	109855	347	22.21	362781	1121	30.47	472636	1468
Bio-fertilizers	404.28	1703615	2719	217.98	2098747	13328	622.26	3802362	16047
Bio-fungicides	41.89	503220	1271	509.76	5134745	21331	551.65	5637965	22602
Bio-pesticides	134.19	2426590	2829	326.57	4535544	18872	460.76	6962134	21701
Micro nutrient mixtures	451.53	5635220	8342	442.98	2394364	9281	894.51	8029584	17623
Mushroom Spawn	1.01	9380	29	9.25	505470	1427	10.26	514850	1456
Organic manures	260.85	336001	609	413.51	966089	7877	674.36	1302090	8486
Total	1302.01	10723881	16146	1942.26	15997739	73237	3244.27	26721620	89383

Table 90: Production of other bio-products by KVKs of Zone-XI

State	Crop category	Production of other bio-products		
		Quantity (No.)	Worth (₹.)	Farmers (No.)
Karnataka	Pheromone traps	16318	337120	1570
	Tricho cards	189	4725	90
Total		16507	341845	1660
Kerala	Pheromone traps	14948	1658761	6735
	EPN	195934	293901	4695
Total		210882	1952662	11430
Grand total		227389	2294507	13090

(e) Livestock and fisheries:

State and category wise details pertaining to production of livestock and fisheries by KVKs is presented in Tables 91 and 92, respectively. Data in Table 91 indicates that KVKs of Zone-XI produced 254325 number of livestock and fisheries of which KVKs of Karnataka produced 54875 and KVKs of Kerala produced 199450. Further, KVKs of Karnataka produced fishlings (35708), poultry chicks (18255), poultry eggs (625), sheep and goat kids (142), piglets (85), dairy calves(46) and rabbit

kids (14). Whereas in case of KVKs of Kerala, fishlings (128202), poultry chicks (67874), poultry eggs (3271), sheep and goat kids (102) and dairy calf (1). Out of total production, maximum number (163910) was under fish followed by poultry (86129), poultry eggs (3896), sheep and goat (244), piggery (85), dairy animals (47), and rabbits (14), which were provided to 13241 farmers (Table 92).

Table 91: State wise production of livestock and fish fingerlings by KVKs of Zone-XI

State	Category of livestock/fisheries	Production of livestock/fisheries		
		Quantity (No.)	Worth (₹.)	Farmers (No.)
Karnataka	Fisheries	35708	71416	301
	Poultry chicks	18255	2000847	2177
	Poultry eggs	625	2500	31
	Sheep and goat kids	142	547050	72
	Piglets	85	254400	66
	Dairy	46	864836	27
	Rabbit	14	5700	6
Total		54875	3746749	2680
Kerala	Fishlings	128202	256404	1330
	Poultry chicks	67874	5177728	6052
	Poultry eggs	3271	13084	3018
	Sheep and goat kids	102	458341	160
	Dairy	1	25000	1
Total		199450	5930557	10561
Grand total		254325	9677306	13241

Table 92: Category wise production of livestock and fish fingerlings by KVKs of Zone-XI

Category of livestock/fisheries	Production of livestock/fisheries		
	Quantity (No.)	Worth (.)	Farmers (No.)
Fisheries	163910	327820	1631
Poultry chicks	86129	7178575	8229
Poultry eggs	3896	15584	3049
Sheep and goat kids	244	1005391	232
Piglets	85	254400	66
Dairy calves	47	889836	28
Rabbit	14	5700	6
Total	254325	9677306	13241



Arka microbial consortium production unit at KVK, Tumakuru-II



Black pepper seedlings at KVK Uttara Kannada



Metarizium production unit at KVK, Belagavi-II



Nursery unit at KVK, Ramanagara



Nursery unit at KVK, Udupi



Pepper nursery at KVK, Khozhikode



Planting material production unit at KVK, Alappuzha



Rapid multiplication of turmeric at KVK,
Chamarajanagara

3.1.6 Kisan Mobile Advisory Service (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 needy people. KVKs are sending text information/voice calls to registered farmers advising them on the issues of agricultural importance from time to time and details of them during the reporting period are presented in Table 93. Data from the Table shows that 42 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, 10216 text messages were sent to 35.70 lakh farmers. Among these most messaging was related to crops (4756) followed by weather (4091), awareness (494), livestock (456), other enterprises (310) and marketing (109).

Table 93: State wise SMS text on priority areas sent to farmers by KVKs of Zone-XI

State	KVKs (No.)	Farmers (No.)	Crop	Livestock	Weather	Marketing	Awareness	Other enterprises	Total
Karnataka	33	2909099	1468	190	195	98	425	207	2583
Kerala	8	661547	3091	31	3896	11	69	25	7123
Lakshadweep	1	71	197	235	0	0	0	78	510
Total	42	3570717	4756	456	4091	109	494	310	10216

3.1.7 Soil, Water and Plant Analysis and World Soil Health Day Celebrations

A total of 42 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. Further, KVKs are also utilizing this facility for carrying out the soil test based nutrient recommendation for demonstrations and on farm trials besides, rendering advisory services on nutrient based recommendations to the farmers. Details of samples analyzed during the year are presented in Table 94 and data indicated that a total of 43626 samples of soil, water, plant, manure and other received from 40034 farmers belonging to 19170 villages were analyzed. State wise data presented in Table 95 shows that KVKs of Karnataka analyzed 41103 samples followed by

2509 samples in Kerala and 14 in Lakshadweep. In addition to 42 SWTL, 29 KVKs have 45 mobile soil testing kits to meet the growing need of soil testing by farmers and tested 3060 soil samples belonging to 3003 farmers spread across 753 villages (Table 96). After soil testing, KVKs provided soil health cards along with necessary advices about usage of results of soil testing for efficient use of resources. State wise data on distribution of soil health cards is furnished in Table 97 and it shows that a total of 23189 soil health cards were distributed among farmers by KVKs of Zone XI. Out of which 19338 soil health cards are through SWTL and 3851 are through mobile soil testing kits.

Table 94: Samples analyzed by KVKs of Zone-XI

Type of sample	Samples (No.)	Farmers (No.)	Villages (No.)
Soil	29563	27183	11330
Water	13339	12320	7739
Plant	662	485	55
Manure and others	62	46	46
Total	43626	40034	19170

Table 95: State wise soil, water, plant analysis carried out by KVKs of Zone-XI

State	Samples (No.)	Farmers (No.)	Villages (No.)
Karnataka	41103	37765	18925
Kerala	2509	2255	241
Lakshadweep	14	14	4
Total	43626	40034	19170

Table 96: State wise soil testing by KVKs of Zone-XI using mobile soil testing kits

State	Samples (No.)	Farmers (No.)	Villages (No.)
Karnataka	1999	2099	605
Kerala	1061	904	148
Total	3060	3003	753

Table 97: State wise distribution of soil health cards by KVKs of Zone-XI

State	Distribution of soil health cards		
	SWTL	Mobile soil testing kit	Total
Karnataka	18099	2755	20854
Kerala	1239	1096	2335
Total	19338	3851	23189

(a) World soil day celebration

World Soil Day was celebrated by 44 KVKs of Zone-XI on 5 December, 2019 with the participation of 5556 farmers; 34 VIPs including Hon'ble Ministers, MPs and MLAs; 116 other public representatives; and 302

officials. On the occasion, 3269 soil health cards were distributed among farmers. A total of 105 news items related to celebration of world soil day covered by media across the Zone.



Celebration of World Soil Day at KVK, Chamarajangara

3.1.8 Rainwater Harvesting Units

Rainwater harvesting units with micro irrigation system were established in 16 KVKs. These KVKs conducted 53 training courses and 67 demonstrations and produced 177137 planting material utilizing the facility as well. Further, 22593 farmers and 1995 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. 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 with development departments were made to problematic fields and helped to identify emerging problems. Technical backstopping required for successful implementation of various schemes and programmes in the district was the major responsibility of the KVKs in the collaborative activities.

(a) Convergence through Agricultural Technology Management Agency (ATMA):

Convergence with ATMA enabled KVKs to promote various technologies in their respective districts and details are given in Table 98. KVKs participated in 721 programmes organized by ATMA during the year and at the same time KVKs organized 434 programmes in collaboration with ATMA.

Table 98: Details of linkages with ATMA by KVKs of Zone-XI

Programmes	Linkages with ATMA by KVKs					
	Karnataka		Kerala		Total	
	Programmes attended by KVK staff (No.)	Programmes organized by KVK staff (No.)	Programmes attended by KVK staff (No.)	Programmes organized by KVK staff (No.)	Programmes attended by KVK staff (No.)	Programmes organized by KVK staff (No.)
Meetings	98	20	51	21	149	41
Research projects	19	12	11	4	30	16
Training programmes	171	35	82	57	253	92
Demonstrations	67	172	6	5	73	177
Kisan mela	46	19	41	15	87	34
Technology week	3	11	4	2	7	13
Exposure visit	4	1	3	3	7	4
Exhibition	33	7	9	2	42	9
Soil health camps	24	8	4	3	28	11
Animal health campaigns	5	6	5	0	10	6
Video films	2	0	18	0	20	0
Books	1	2	0	0	1	2
Extension literature	1	7	0	0	1	7
Pamphlets	2	2	0	0	2	2
Watershed approach	2	20	0	0	2	20

Integrated farm development	8	0	0	0	8	0
Agri-preneurs development	1	0	0	0	1	0
Total	487	322	234	112	721	434

(b) External funded projects/schemes:

External fund received by KVKs to organize various programmes and activities through convergence and linkage is presented in Table 99. A total of Rs. 1195.86 lakh fund received by KVKs of Zone-XI during the reporting year of which Rs. 705.31 lakh by KVKs of Karnataka and Rs. 490.55 lakh by KVKs of Kerala. In terms of total amount received, support from the state governments was high in both Karnataka and Kerala, which included development departments also. 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. Various Boards and Directorates also supported KVK activities through convergence and linkages for optimum utilization of available resources.

Table 99: Details of external fund received by KVKs of Zone-XI through convergence and linkages

Name of external funding Agency	KVKs (No.)	Amount Received (Rs. in lakh)
Karnataka		
Agricultural Technology Management Agency (ATMA)	1	2.80
Coconut Development Board, Bengaluru	1	0.56
Dept. of Animal Husbandry, Mysuru	1	3.00
Government of Karnataka	6	200.29
ICAR Institutes	2	11.29
ISK Biosciences India Pvt. Ltd., New Delhi	1	1.70
Karnataka Agriculture Price Commission, Govt. of Karnataka	4	85.00
Karnataka State Biofuel Development Board, Govt. of Karnataka	2	14.63
KFD, Honnavar	1	2.50
MANAGE, Hyderabad	4	45.80
National Bank for Agriculture and Rural Development (NABARD)	1	8.96
National Horticulture Mission	3	3.00
NMSA, New Delhi	1	75.00
Private Agency	2	4.20
Rashtriya Krishi Vikas Yojana (RKVY)	1	162.00
State Agricultural Universities	6	41.74
State Department of Horticulture	8	42.84
Total		705.31
Kerala		
Agricultural Technology Management Agency (ATMA)	1	1.45
Department of Agriculture and Farmer's welfare, Govt. of Kerala	6	250.02
DST- ISTD project (Swadeshi Science Movement-Kerala)	1	7.00
Government of Kerala	3	48.82
ICAR Institutes	3	3.00

ICDS	1	3.50
MANAGE, Hyderabad	2	24.00
National Bank for Agriculture and Rural Development (NABARD)	3	45.36
National Fisheries Development Board	1	13.00
National Horticulture Mission	2	30.75
State Horticulture Mission, Kerala	1	18.50
State Medicinal Plants Board, Kerala	1	0.35
State Planning Board, Kerala	4	44.80
Total		490.55
Grand Total		1195.86

3.1.10 Success Stories and Cases of Large-scale Adoptions

3.1.10.1 Karnataka

(a) Crop residue management in sugarcane (KVK, Belagavi-II)

Sugarcane is the major commercial crop of Belagavi district. It is grown in an area of 194483.00 ha and generating a large quantity of trash (8.00 t/ha) in the sugarcane fields. This trash contains good amount of nutrients which are to the tune of 0.35% of nitrogen, 0.13% of phosphorus and 0.65% of potash besides containing micro nutrients needed for plant growth. However, farmers are destroying the trash by burning and there by loosing these nutrients. Burning of sugarcane trash, a common practice causes environmental pollution too. On an average 8000.00 t of trash used to be burnt in Khanapur taluk. This caused loss of nutrients and emission of carbon leading to environmental hazards. Realizing this, KLE KVK, Belagavi-II has conducted frontline demonstrations on trash management in ratoon sugarcane in an area of

8.00 ha involving 20 farmers in Khanapur taluk. Sugarcane trash, after harvest of the crop, was treated with compost culture (12.00 kg /ha along with application of urea 50.00 kg/ha and single super phosphate 50.00 kg /ha. The initial and after harvest soil test results were recorded. Sugarcane productivity enhanced from 62.60 t to 70.70 t/ha and net return increased from ₹. 1.03lakh/ha to ₹. 1.20lakh/ha due to trash incorporation in ratoon sugarcane. Overall economic gain realized was ₹.90.00 lakh in the cluster villages. This intervention has led to the improvement in the soil fertility status. At present, technology has spread to an area of 500.00 ha in cluster villages of Khanapur taluk.

		
View of sugarcane trash burning	Interaction of scientists on trash management	Incorporation of sugarcane trash

(b) Pulse magic promoted yield in pigeonpea (KVK, Kalaburagi-I)

Pigeonpea is a major crop of Kalaburagi district occupying about 5.00 lakh ha area. Farmers are unable to harvest the potential yield due to various biotic and abiotic stresses. Biotic stress can be managed by following IPDM, but abiotic stress was difficult to manage. So, abiotic stress led to heavy loss to farmers due to dropping of flowers. Generally, farmers used to spray NAA to avoid the flower drop. Research of ZARS, Kalaburagi (UAS, Raichur) changed the scenario by developing a product named as pulse magic – a perfect blend of nutrients and growth promoters that avoids flower drop in pigeonpea. This technology was recommended and included in the package of practices of UAS, Raichur during 2013-14. Recommendation is spraying of 2.00 kg of pulse magic at 50.00% flowering of pigeonpea and next spray with same dosage 15 days later to reduce pigeonpea flower drop.

KVK Kalaburagi-I played a vital role in producing and marketing the pulse magic. Cluster FLDs under NFSM were conducted by KVK using pulse magic to show the worth of technology during 2014-15 to 2016-

17. Totally 150 CFLDs were conducted in the district. As other KVKs of Karnataka also organized demonstration of pulse magic under NFSM, this led to popularization of technology very quickly in the state of Karnataka. Totally 54.75 tonnes of pulse magic was used in an area of 10950.00 ha where demonstrations were conducted in the state by all KVKs during 2015-16 to 2018-19. This boosted the confidence of the scientists and farmers about the technology. KVK also conducted different extension activities for spread of technology. Farmers got 80-100 kg additional yield per acre (18.00% higher) that worth of ₹. 6000.00. By applying pulse magic, Kalaburagi district has got additional yield of 27375.00 q worth of ₹. 164250000.00 (Rupees sixteen crore forty two lakh fifty thousand only) from pigeonpea crop. Now, KSDA is also planning to include pulse magic in the subsidy scheme.

	
<p>Pulse magic</p>	<p>Pigeonpea crop with pulse magic</p>
	
<p>Pigeonpea crop with pulse magic</p>	<p>Effect of pulse magic</p>

© Management of yellow mosaic virus in pole bean through integrated approach(KVK,Bengaluru Rural)

Pole bean is one of the important vegetable crops of Karnataka and is being cultivated in an area of 671.00 ha with production of 12866.00 t in Bengaluru Rural district. Average yield of pole bean in Bengaluru Rural district is 28.00 t/ha as against potential yield of 32.00 t/ha which accounts for 12.50% lesser yield. This is mainly on account of damage caused by yellow mosaic virus transmitted by whiteflies (*Bemisiatabaci*) to the extent of 42.00% crop loss. In view of above facts, the innovative farming technology on management of yellow mosaic virus in pole bean through integrated approach developed by Indian Institute of Vegetable Research (IIVR), Varanasi was demonstrated and disseminated in Bengaluru Rural district in order to achieve higher yield, quality and profit.

Technology was demonstrated by KVK Bengaluru Rural in farmers fields belonging to Krishnarajapura village, Nelamangala Taluk, Bengaluru Rural

district where farmers were growing pole beans as main crop using pesticides with higher cost of cultivation. Integrated approach consisted seed treatment with thiomethaxam 25 WG – 5.00g/kg seeds, black silver polythene mulch, intercropping with two rows of border crops of maize, soil application of *Pseudomonas fluorescens* along with neem cake, installation of yellow sticky trap @ 10 No./acre, spraying of neem soap (5.00g/l), seaweed extract (1.5ml/l), entomopathogenic fungus *Beauveria bassiana*(2.00 ml/l), thiamethoxam 25.00% WG (0.50 g/l) and imidacloprid 17.80 SL (0.50 ml/l). Farmers could harvest 32.21 t/ha by adopting this technology as against 28.34 t/ha of their own practice. Further, this technology gave net returns of ₹. 563276.00/ha as against net returns of ₹. 424733.00/ha in farmers practice. This technology has reached to 40 farmers in the district covering an area of 25.00 ha.

	
<p>Method demonstration on seed treatment</p>	<p>Method demonstration on enrichment of <i>Pseudomonas fluorescens</i> with neem cake</p>
	
<p>Chemical spraying</p>	<p>Group discussion with farmers</p>



(d) Spread of finger millet variety ML-365 in Chitradurga district(KVK, Chitradurga)

Finger millet is one of the important food crops of Chitradurga district. It is cultivated in an area of 44901ha with a total production of 91437 MT and average productivity of 1540 kg/ha under rainfed conditions. But yields obtained by farmers in the region are low due to several reasons. Problem analysis revealed that the low yields were due to imbalanced nutrient management, non-application of bio fertilizers, lack of knowledge on split application of fertilizers, deficiency of micronutrients, attack of stem borer, occurrence of neck blast and use of old varieties. Keeping this in view, KVK, Chitradurga has conducted frontline demonstrations during 2014-15 to 2016-17 to show the yield potential of finger millet variety ML-365 in farmer's fields. Application of organic manures (7.5 t/ha), bio-fertilizers (500 g/ha seeds), ZnSO₄(10 kg/ha), recommended dose of fertilize

(50:40:25 NPK kg/ha) along with IPDM measures were demonstrated in comparison to check plots (applied only inorganic fertilizer 50 kg urea). Demonstrations recorded higher grain yield (18.70 q/ha) to the tune of 27.00% over check (13.70q/ha). Income before and after adoption of improved technologies was ₹. 31715.00/ha and Rs.42670.00/ha, respectively. Due to introduction of new variety, stem borer and neck blast incidence was less as compared to local variety. After seeing the results, only five farmers adopted this variety during first year. Continuous efforts, enthusiasm and dedication of KVK scientists has led to spread of ML-365 among 4250 farmers of the district covering more than 10.00% area in the district within three years.



**(e) Tree mulberry – a boon for rainfed sericulture
(KVK, Kolar)**

Sericulture is a major occupation in Kolar district of southern Karnataka. It is the most important commercial crop with high returns in short term. Mulberry is a perennial crop, once it is planted, farmers can continuously take mulberry leaf production for silkworm rearing upto 20 years. Since most of the farmers in Kolar district are involved in cultivating mulberry in row method (3x3 ft) of planting which requires more irrigation water. Though mulberry is the only food plant for silkworm, its production was declined over the past decades and thus economy of the farmers got affected. The probable reasons for low productivity in mulberry are decreased water level in tube wells due to inadequate rainfall, depletion of underground water table and continuous drought that made it difficult in sustainable mulberry leaf production as well as silkworm rearing.

Keeping the above in view, technology of tree method of mulberry cultivation under dry land condition developed by CSRTI, Mysuru has been taken up in farmers field as a Frontline demonstration (FLD) by KVK, Kolar in villages viz., Nayakarahalli and Venugopalapura during 2016-17 and 2017-18 and also conducted several training programmes to address water management, yield, quality and income related issues with a intention to spread the technology. As per technology raising mulberry plant in pit method was followed with a dimension of 3 x 3 x 3 ft length, width and height and plant spacing of 10 x 10 ft. After planting, each pit is filled with organic residues like FYM, rearing bed waste, left over mulberry twigs to cover the pit and also later improve the soil moisture and fertility. For canopy management, first pruning will be done after 6 months of planting at the height of 3 ft from the ground level, 4-5 active branches are maintained for tree shape with secature only.

Subsequent pruning increased branches as well as leaf yield.

Before intervention of the technology most of the sericulture farmers in villages cultivating mulberry in row system and getting an average leaf yield of 40.08 t/ha/year. After intervention of tree mulberry plantation system, farmers are getting 9.94 t/ha, 42.68 t/ha and 66.34 t/ha/year during Ist, IInd and IIIrd year of mulberry cultivation, respectively compared to row system of plantation with 15.14 t/ha, 43.65 t/ha and 49.71 t/ha/year, respectively. Further, leaf moisture content and leaf moisture retention were recorded maximum (73.08% and 82.10%) as compared to row system of mulberry cultivation (72.19% and 81.60%). Technology was demonstrated through frontline demonstration which helped the farmers in increasing their farm income. Net returns under FLD plots (₹. 80215.00/ha) increased by 21.65% over farmers practice (₹. 65937.00/ha). BCR recorded was 3.03 as compared to farmer practice 2.17. At present 500 farmers are involved in tree mulberry cultivation and getting net returns upto ₹.7139000.00 and water saving up to 386313.00 l/acre during summer. Gaining additional income through intercrops also upto 35000.00/acre of tree mulberry. During years 2016-17 and 2017-18, technology was demonstrated through FLDs by KVK, Kolar covering 6.00 ha area and there was upsurge in area upto 200.00 ha covering 500 farmers in the year 2018-19 adopting the technology which was further popularized through training programmes and field days organized by KVK, Kolar for technology dissemination in collaboration with department of sericulture, Kolar.



Different stages of tree mulberry at Kolar district

(f) Modified PG protocol in management of repeat breeding in dairy animals (KVK, Uttara Kannada)

Uttar Kannada district comprises about 424771 cattle population (Government of Karnataka animal senses 2012) of which 47167 cross bred animals, 289788 indigenous cattle and 87816 buffalo population. Nearly 30.00% of the dairy cows or buffaloes are suffering from repeat breeding after one or more lactations. Reasons attributed for repeat breeding are endocrine dysfunctions like faulty LH secretion, improper steroidogenesis, hormonal imbalance results in delayed ovulation, prolonged oestrous (up to 3 to 4 days), anovulation, irregular oestrous etc. Further, Uttar Kannada district receives rain ranging from 2000 to 4000 mm annually, that results in soil erosion leading to micronutrient deficiencies like calcium, phosphorus, iodine, cobalt, copper, zinc and magnesium, vitamin-A and selenium and vitamin-E predispose for repeat breeding. Lack of availability of good quality green fodder and higher dependency on commercial cattle feeds resulting in subclinical ruminal acidosis and metabolic disorders which

affects serum glucose, urea, albumin, globulin, and non-esterified fatty acids affects follicular growth and conception rate. In addition to these, another major cause of repeat breeding is improper heat detection and AI techniques adopted by the para veterinary staffs.

Keeping the above in view, KVK, Uttara Kannada initiated frontline demonstration during 2017-18 for management of repeat breeding in cattle by using modified PG protocol with dewarming and supplementation of micronutrients to the problematic cows. After confirmation of the repeat breeding cow, estrous was synchronized by 2 doses of cloprostenol (PGF₂ α analogues 2.0 ml) at 11 to 12 days apart followed by single dose of Buserelin (GnRH analogue 2.5 ml/IM) between 60 to 72 hours after of 2nd cloprostenol dose with AI and supplementation of micronutrient. The pregnancy was checked after 45th day of insemination. Further, KVK organized training for extension personnel

and inseminators about management of repeat breeding and use of double PG synchronization protocols during 2017 to 2019 wherein 61 personnel trained.

Results of protocols compared before and after treatment with respect to onset of estrous signs, duration of estrous, conception rate and economic impact revealed that treated animals showed well expressed estrous signs and duration of estrous was reduced from average about 72

hours to less than 48 hours. Further, conception rate was 83.30% in 2017-18 and 85.70% in 2018-19. Adoption of modified PG synchronization protocol resulted in decreased inter calving period and age at first calving, inturn enhancing productivity and income of farmers. Protocol being used by Veterinarians and Inseminators in their day-to-day regimen and covered about 268 repeat breeding animals.

	
<p>Examination of repeat breeding cow</p>	<p>Pregnancy diagnosis</p>
	
<p>Examination of repeat breeding cow</p>	<p>Calf born to treated animal</p>

(g) Agri+horti+silviculture (KVK, Koppal)

– case of Shri. Veeranagowda Kulkarni

Progressive farmer Shri. Veeranagowda Kulkarni, Malkana Maradi village, Gangavathi, Koppal district has adopted Agri+Horti+Silviculture in his field of 8.00ha encountered with uneven distribution, erratic and scanty rainfall. He adopted farming system interventions such as planting horticulture crop like banana, arecanut, guava, lemon, custard apple; forest species like sandal, red sandal, teak and sliver oak; multi-storied cropping system (coconut, curry leaf, lemon, sapota, guava, mango and drumstick); organic farming; solar

pump set for irrigation; and dairy under the technical guidance of KVK, Koppal. He is earning ₹. 96000.00-110000.00/year from 3.00 acres of banana (G-9), ₹.200000.00/year from 3.00 acres of coconut+curryleaf+lemon, ₹.78000.00/year from 3.00 acres of sapota+guva+lemon, ₹.300000.00/year from 3.00 acres: drumstick+mango, ₹.20000.00/year from apiculture and ₹.200000.00/year from dairy. Further, he realized low input cost, improved soil fertility, increased productivity and quality of the produce, getting premium market price and improved his livelihood security and socio economic status.



A view of sandal and red sandal field



A view of banana intercropping with arecanut

(h) Enhancing the livelihood through upgradation of local goat (KVK, Gadag)- case of Shri Takrappa Kempanna Lamani

Farmers who are practicing goat farming in dryland area are earning low income with local goat due to less sustainability under prevailing high temperatures, less body weight gain, low milk yield and long gestation period. So to overcome these problems, Jamunapari buck was introduced through NICRA project in Mahalingapur village during 2016-17 by KVK, Gadag. Purpose of demonstration was to achieve enhanced body weight, increased milk yield and capacity to attain early maturity even under increased temperature conditions as this breed of Jamunapari buck is tolerant to high temperatures. Three Jamunapari bucks were provided to farmers under the project for upgradation of local goats in the month of January, 2017.

Shri Takrappa Kempanna Lamani is one among goat farmers managing the small enterprise since many years. It is the only source of income for his family of four members as he does not possess any land. He was rearing a flock of 50 non-descriptive goats. Due to lack of scientific knowledge in management practices of goat, he faced lot of mortality in goats. During 2016, his goat population reduced to three. This has put him in distress as he did not have alternative livelihood option. During this period, he came in contact with KVK, Gadag as the village was adopted under National Innovation and Climate Resilient Agriculture (NICRA) project. KVK trained Shri Takrappa on scientific management of goat with major focus on balanced nutrition, deworming, vaccination and disease management. During 2017, he

was given Jamunapari Buck by KVK and at the same time he purchased 7 she goats from the local market. Now, he has a unit of 10 +1 goatry. The unit produced 12 kids including 6 male and 6 female. He sold 6 male kids for the price of ₹.5500.00/kid to other goat farmers in the region and earned an income of ₹.33000.00. In subsequent years, his goat unit size increased to 32 (31+1). Beginning of 2019, Mr. Takrappa sold 10 bucks and earned an income of ₹.60000.00. He sold it to neighbouring places of Shiggoan, Bankapur, Majjur, Hirevaddatti and Kalasapur. From the income earned, he purchased another 20 female kids. During the same year, he sold 13 does (she goat) and earned an income of ₹.1.00 lakh. Due to KVK's continuous technical support, he is able to achieve increased income.

He says that, upgraded (Jamunapari) one year old goat has body weight of 50.00 kgs as against 30.00 kg in local breed. Further, he says that he is providing upgradation services to other goat units free of cost. Due to this intervention, upgraded goat population is increasing in Mahalingapur village as well as in neighbouring villages and taluks. Now, Mr. Takrappa has a unit size of 29 upgraded kids and 1 Jamunapari buck. He owes the credit to NICRA project for improving his livelihood status.



Goat unit of farmer Takrappa Kempanna Lamani

(I) Whole tuber planting with potato planter enhanced profit (KVK, Hassan) – case of Shri Suresh

Shri Suresh aged 36 years belonging to Haruvanahalli village, Salagamehobali, Hassan taluk and district has adopted whole tuber planting with potato planter under the technical guidance of KVK, Hassan. Technologies followed were whole tuber planting, uniform ridges 10-11 inch from furrow, bigger ridges for more moisture and paired row system (40cm X 20cm). These technologies boosted germination percentage, uniform depth of sowing, uniform germination, planting one time activity (sowing, ridges, furrow and fertilizer), one time earthing up in case of heavy rain, good aeration, sunlight penetration, seed grading and chemical treatment, adjustment of row to row spacing, uniform seed to seed sowing (7 to 7 inch or 9 to 9 inch), reduced sowing time to 2 hours and reduced cost of sowing and intercultivation operations. This technology gave net profit of ₹. 21440.00/ha as compared to farmers practice where the cost for cultural activities is more and quality of tuber harvested is poor.

KVK has strengthened activities on capacity building of farmers on whole tuber planting with potato planter through demonstration of method of planting (0.60 ha) at KVK, Kandali farm, 7 on and off campus training programmes wherein trained 223 farmers, 2 field days wherein 363 farmers participated, 7 exposure visits with the participation of 223 farmers, 5 group discussion meetings with 142 farmers, 10 film shows for 374 farmers, 18 field visits and 5 publications. These activities have motivated the farmers and line departments to spread the technology among neighboring farmers and villages in Hassan and Arakalgud taluks. At present the data reveals that the area under mechanical potato cultivation has increased from 20.00 ha during 2018 to 150.00ha during 2019 with the intervention of KVK and GIZ company.



Whole tuber planting with potato planter by KVK Hassan



Management of whole tuber planted fields

(j) Sunhemp green manuring crop increases mulberry leaf yield (KVK, Haveri) – case of Shri Basavanagouda

Shri Basavanagouda is a progressive farmer of Yadagodi village of Hirekerur taluk practicing mulberry cultivation since 10 years on 2 acre land. But due to low and unsustainable mulberry leaf yield, he approached KVK, Hanumanamatti scientist and sericulture department officials and adopted sunhemp green manuring crop in between two rows of mulberry crop as per the guidance of KVK. Sunhemp crop incorporated in soil at 40 days after sowing. As a result he produced good quality mulberry leaf and better leaf yield due to improvement in soil fertility. This also helps in reduced cost of mulberry leaf

production and 10.00 – 15.00% more cocoon yield. He got income of ₹. 6.00 lakh/year and maintaining sustainability since 3 years. Further, he provided employment for 12 women and 4 men labours throughout the year by rearing mulberry silkworm and other horticulture crops. This technology is being spread through field visits, group discussions and trainings. More than 50 farmers adopted this technology and obtained 20.00-25.00% more leaf yield. Shri. Basavanagouda became a role model for the other mulberry growers from surrounding villages.



Field performance of finger millet variety ML-365 with intercrops

3.1.10.2 Kerala
(a) Satellite Production Centres (SPCs): Income for partner farmers and a solution to unfavourable location of KVK, Ernakulam

Supply of quality agro inputs is one of the mandates of KVKs. Whereas Ernakulam KVK being located in a place bordering Arabian sea has lack of vehicle accessibility, issue of sea water logging, accelerated corrosion, cyclones *etc.* and production of seedlings, manures, establishment of animal units *etc.* in the KVK farm is not practically viable. On the other hand the greatest issue facing farmers is lack of marketing avenues for any commodities they produce. It is in this context that the idea of Satellite Production Centre (SPC) was conceived and implemented for production of fish fingerlings, vegetable seeds, micronutrient mixtures, organic manures, poultry chicks, vegetable seedlings, fruit grafts *etc.* at farmers fields with a buy-back arrangement with KVK for marketing through its sales counter established in the host organization of KVK located in a well accessible place. Production is under close technical monitoring of KVK scientists. Farmers are selected by various means

including advertising in local news papers and inviting applications and conducting interviews. Partners of KVK projects and ex-trainees are also part of this venture. Selected individual farmers or groups are provided hands on training in respective technologies and KVK assisted them to establish production units at their farms at their cost. Raw materials required for production *viz.*, seeds, saplings, parent stock, manures, chemicals, packing materials *etc.* are supplied by KVK. Scientists of KVK do regular visits, inspect check list of activities and record all operations, production details, input management, growth observations *etc.* Farmers get a share of 40.00-50.00% of the sales value depending on the commodity. In addition to tackling the issue of non-accessibility to KVK, these SPCs also helped creating livelihood for the partner farmers. Details of such SPCs along with production and average income is provided in Table 100.

Table 100: Satellite production centres established by KVK, Ernakulam

Name and address of SPCs	Total production since inception	Monthly income (Rs.)
SPG Pearlsport seeds, C/o Hari P.S., Pallathu Veedu, Vavakkad, Moothakunnam, North Paravur.	12500 Nos.	10000.00
SPG Pearlsport seeds, C/o Vinod Kumar & Unni T. R., Devasom Parambil, Pizhala, Kadamakudy	13500 Nos.	13000.00
SPG Pearlsport seeds, C/o Dharmajan, Kavalkaran Veedu, Elakunnapuzha	14000 Nos.	11000.00
SPG Pearlsport seeds, C/o Shibu CV, Cocheril, Kumbalangi	20000 Nos.	15000.00
SPG Fresh water fish seeds, C/o Joseph T.K, Thakidiyil, Kothamangalam	55000 Nos.	3000.00
SPG Vegetable seedlings, Brothers of St Joseph Cottolengo, Cottolengo Road, Palluruthy	94000 Nos.	8000.00
SPG Micronutrient mix, Janani activity group, Rubber board building, Edakkattuvayal.	3.9 MT	2500.00

SPG Soil less media,VypeenHarithaShree SHG, Edakkattuvayal	12.0 MT	12000.00
SPG Desi cow products, C/O C. T. Dinoj, Cheruvallypadi, Paniyeli, Vengoor.	3.5 MT	5000.00
SPGFish manure, C/o Saiju, Putrhanthara, Mulavukad.	5.0 MT	5000.00
SPC Poultry chicks, C/o K.K.Sobhanan, Kadamattussery, Kuzhupilly.	4300 Nos.	15000.00

		
Kadaknath chick production unit	Seedling production unit	Cow products production unit
		
Fish waste manure production unit	Micronutrient mixture production unit	Pearlspot seed production unit

(b) Mayyil Rice Producers Company(KVK, Kannur)

Paddy is cultivated in Kannur district over an area of about 5000.00 ha. It is equally important for both the northern midland laterite and northern coastal plains, the two prominent agro ecological units of the district. Almost every paddy cultivator is either a small or a marginal farmer. Paddy is cultivated mainly for home consumption and hence the adoption of technologies is very limited. Productivity of paddy is around 2140.00 kg/ha (Dept of Economic and Statistics,Govt.of Kerala). Analysis of soils in northern midland laterite

region revealed that about 65.00% soils were highly acidic and 55.00% soils were low in organic matter.Among major nutrients, potassium was deficient in 90.00% of soils where as available P was high in almost 70.00% soils leading to nutrient unavailability during critical growth stages of the crop. Both calcium and magnesium were deficient in almost 85 % soils and among micro nutrients Zn and B were limiting, leading to poor crop health and higher incidence of pests and diseases resulting in low yield.

In this regard, a Standard Operating Protocol(SOP) was developed by KVK,Kannur to address all problems related to soil health, quality seeds, land preparation, spacing, management etc., to revive paddy in Mayyil Panchayat coming under northern midland laterite area with a target slogan of producing 300.00 kg from 10.00 cents, means 7500.00 kg/ha. The principle of Result Based Management(RBM)was adopted in all *Padasekharams* to make an impact of the programme.

Soil ameliorants like lime were applied to the paddy field @600.00 kg/ha in two splits, 500.00 kg/ha as basal dose at the time of land preparation and remaining 100.00 kg/ha application 7 days before the application of second dose of fertilizer. Organic manure @5000.00 kg/ha and nutrients as per soil test values (30:10:60) were given as per the protocol developed by KVK in different areas of the same agro ecological units in Mayyil, Kuttyattur(SAGY) and Kurumathur panchayats. A single variety of seeds were used in each *Padasekharam* to make the operations easy and to manage pests and diseases, in case of outbreak.High yielding varieties like Sreyas, Uma, Vaisak, Athira, Jaya, Jyothi, Swarnaprabha andMahamaya were used in different *Padasekharams* with SOP and the seeds of these varieties were mobilized from KAU and state seed authority.

In order to achieve the target, capacity building programmes were conducted in all 25 *Padasekharams* at different intervals and different crop stages to highlight the potential of paddy as an income generating crop. A Farmer Producer Company was formed during this year to take up all activities based on the protocol. Fifteen tractors and tillers were arranged from different parts of the state for the land preparation. Harvesting was carried out using combine harvester to reduce the cost. Since the unit of operation was consolidated at *Padasekaram* level, it was very helpful for mechanizing the operations.

The first farmer producing company of paddy in Kerala formed in Mayyil by mobilizing shares @ 10000/share holder from 46 paddy farmers of the Panchayat during

the first year of implementation has received assistance from NABARD with KVK as its POPI (Producer Organisation Promoting Institution). Mayyil today has its own farmer-producer organisation (FPO) called the Mayyil Rice Producers' Company (MRPC), which brands, mills, and markets its own rice. The area under paddy has doubled from 300.00 ha to 600.00 ha by adopting the standard operating protocol of KVK, Kannur. This SOP had a tremendous impact in increasing productivity and income of Mayyil farmers which led to replication of this protocol in more than 10 panchayaths through Haritha Kerala Mission in Kannur district.

Crop cuttings made by economic and statistics department revealed yield of 4348.00 kg/ha which is almost double that of the previous year. Adoption of soil amelioration measures and use of quality seeds were the only technologies adopted with all other practices remain same as that of farmers practice. Productivity levels ranged from 8200.00 to 11290.00 kg/ha in different *Padasekharams*. There was no problem of lodging in fields where the complete package was adopted. Data reveals that the area increased to 298.00 ha from 100.00 ha during the year and increase in production was about five folds and productivity almost doubled.

Entire rice produced in Mayyil area was procured by Mayyil Rice Producer Company for selling rice after processing. Processing is done in a decentralized manner to reduce cost of huge investments. Primary and secondary processed products like raw rice, rice with bran, rice flour and rice flakes are marketed through Ecoshops and other outlets. With the adoption of complete package of soil management in paddy cultivation the farmers of Kannur district could get an average additional income of Rs 90700.00/ha.

With the technological support of KVK, Mayyil FPO is now undertaking seed production programme (Vithugramapadhathi) in an area of 30 acres for timely supply of quality seeds to its member farmers. Breeder seeds and foundation seeds from Kerala Agricultural University are supplied through participatory seed

production programme with KVK, Kannur. This year Mayyil Rice Producers Company is also venturing into new concepts like contractual farming in nearby panchayats, thereby planning to popularise and revive paddy farming in entire district.



Initiating the paddy transplanting by Hon'ble Minister of Agriculture, Kerala in the presence of Hon'ble Member of Parliament



Harvesting the paddy crop by Hon'ble Minister of Agriculture, Kerala in the presence of digmtaries

(c) Revitalization of rice farming in Idukki district (KVK, Idukki)

Agriculture in Kerala has undergone significant structural changes in the form of decline in the share of Gross State Domestic Product and commercialization of agriculture. Gross cropped area and net sown area in the state have declined over a period of time. During 1999-2000, and 2017-18 districts like, Idukki, Ernakulam, Palakkad, Wayanad and Kannur districts have shown declining growth rate in area under paddy cultivation

which is less than the state average. Idukki has shown declining trends in both area and production. To bring about a change in this negative trend, and to create an awareness regarding the importance of rice cultivation for maintaining ecological balance, KVK, Idukki has started a demonstration on cultivation of Akshaya variety of rice in 2019-20 in 2.00 ha of area with a broad vision

to bring back the farmers to rice cultivation. Akshaya (PTB-62), is developed from two varieties of Pranav and Chettadi by Regional Agricultural Research Station, Pattambi. Akshaya with a better yield potential than Uma, Swetha and Karuna will help to bring back the lost glory of Idukki in rice cultivation. Between 2019 and 2020, in order to educate the farmers regarding the various requisites of rice production, KVK has conducted numerous trainings regarding the production practices of Akshaya variety of rice. Timely intervention during different growth stages of rice, advisory services, follow-up visits and technical support as and when required were provided not just for farming activities, but also for allied support inventory.

During the period from 1980-81 to 2011-12, Idukki has lowered negative cumulative growth rate in area compared to the state average. But Akshaya variety of rice when cultivated on 2.00 ha of land was more successful with good grain yield of 7.00 t/ ha and straw yield of 14.00 t/ha. On the basis of costs incurred and revenue generated, an economic analysis was conducted and obtained a Benefit Cost Ratio of 2.80. This will surely prove to be an eye opener for the farmers, that rice cultivation can also be profitable in their local conditions. Before the intervention of KVK, rice cultivation was almost getting wiped away from the agricultural map of Idukki. After the demonstration on 2.00 ha of land, number of farmers who are interested to take up rice farming has increased. This is evident from the increased requests for more trainings and planting materials.



Revitalization of rice farming in Idukki district

(d) Integrated Farming System(KVK, Alappuzha) – case of Shri Bhaskaran

KVK, Alappuzha is popularising Integrated Farming System (IFS) as a flagship programme for the last 8 years by developing IFS models for different land holding sizes in the district. So far 21 IFS model units have been developed in various parts of the district and these units are regularly monitored. In addition, a number of partners of other activities like FLD, OFT and other training programmes have changed their farming practices in to IFS through continuous interactions with KVK. A classical example for this is the farming system of Shri. C Bhaskaran, Kaleekkatharayil, Olakettyambalam, Chettikulangara, a 70 years old farmer belonging to Scheduled Caste category whose sole income is through agriculture and allied activities from 1.50 acres of own land in which 10 cents area is fresh water pond and remaining area is fully utilized for crop and animal husbandry activities.

Shri. Bhaskaran was one of the active participants in training programme conducted during the year 2007- 08 on fresh water fish culture which was funded by NFDB and training programme was of 10 days duration. Before attending the training programme, he never thought of the income from fish in his 10 cents of fresh water pond but was depositing all his farm and household waste in the pond. His land including the pond was left unutilized except with few crops that too unscientifically. In the following years he attended various trainings on dairy farming, fodder cultivation, vegetable cultivation, banana cultivation etc. His farming practices changed to a model farm after obtaining the exposure given by KVK. He cleaned pond and started rearing *Tilapia* and *varaal* fishes. Realising the demand for ornamental fishes, he started rearing ornamental fishes like gold fish, Gowrami, Red *Tilapia* etc. Customers for ornamental fishes come and collect the fishes from his farm. Instead of selling the grown up fish, he started selling fish seeds by expanding the water body area. He sold *Tilapia*, *varaal* and ornamental fish seeds up to 100 -200 No./day and earn daily income of ₹.200.00/day.

Gaining the confidence in scientific farming, he expanded his rice cultivation to 2 acres by leasing in 1.0 acre paddy land. He takes 2 crops of paddy followed by sesamum in summer. By this, every year he could harvest 100.00 q of paddy and 4.00 q of sesamum. Paddy is sold to Supplyco and sesamum sold as seeds @ ₹.350.00/kg. From paddy crop he could earn ₹.50000.00/year with an expenditure of less than Rs.20000.00 as he use farm yard manure which he gets from local breeds of cattle reared in his farm. By following IFS, he could increase his harvest of coconuts from 700 to 1200 annually and earn an income of ₹.18000.00 with an expenditure of ₹.6240.00. A part from this, he is maintaining local breeds of cattle vechur and Kabila by feeding only with byproducts of farm and fodder from his farm thus minimizing the cost. From 2- 3 l of milk obtained every day, he could sell one litre milk/day @ ₹.60.00/l after meeting his domestic consumption. As he use byproducts of crop, the expenditure is only ₹. 10000.00/year. As he gained knowledge on ethno veterinary medicine from his ancestors, he never use any modern medicines for his livestock and poultry. Along with his dairy unit, poultry layers, ducks and ornamental birds are also reared and earn ₹.100.00/day. He earned net annual return before intervention ₹. 24680.00 and after intervention it was ₹. 202710.00. Thus, he gained annual additional return of ₹. 178030.00 through adoption of IFS.

So far he has supplied fish seeds of *Tilapia* and *Varaal* varieties to 60 farmers who were identified and directed by KVK. In addition to the supply of fish seeds he shares his experience with the farmers who approach him for various purpose including ethno medicines for livestock and method preparing of *Jeevamrutham*. He sells half the quantity of harvested sesame as seed to nearly 25- 30 farmers thus facilitating spread of crop in the region.

	
<p>Fish and duck unit</p>	<p>Indigenous cow unit</p>
	
<p>Ornamental birds unit</p>	<p>Poultry unit</p>

3.1.11 Recognition and Awards

- KVK Davanagere received the Zonal Best KVK "Pandit Deen Dayal Upadhyay Krishi Vigyan Rashtriya Protshahan Puraskar 2018.
- Sh.C.M.Mohamed, ChundanVeetil, Mandayapurathu House, Vettom PO, Malappuram district, Kerala received Jagjivan Ram Abhinav Kisan Puraskar / Jagjivan Ram Innovative Farmer Zonal Award-2018.

3.2 Special Programmes

3.2.1 Cluster Frontline Demonstrations (CFLDs) on Pulses under NFSM

ICAR-ATARI, Bengaluru implemented 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 enhance the production of pulses in the country. Under the project, 3325 demonstrations on different pulse crops viz., blackgram, greengram, pigeonpea, chickpea and

cowpea were conducted by KVKs of Karnataka and Kerala in an area of 1330 ha of farmers fields as per the details in Table 101. During summer 2018-19 i.e first quarter of 2019, a total of 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. During kharif 2019-20, a total of 1350 demonstrations were conducted by KVKs of Karnataka in 540 ha, out of which, more number of demonstrations were on pigeonpea (875) followed by greengram (300) and blackgram (175). During rabi 2019-20, a total of 1025 demonstrations were

conducted in 410 ha by KVKs of Karnataka and Kerala, which includes 900 demonstrations on chickpea, 50 demonstrations on greengram and

demonstrations on blackgram by KVKs of Karnataka and 25 demonstrations on blackgram by KVKs of Kerala.

Table 101: CFLDs organized by KVKs of Zone XI on pulses under NFSM

Season	State	Crop	CFLDs on pulses	
			Area (ha)	Demos (No.)
Summer 2018 -19	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 (a)			380
Kharif 2019 -20	Karnataka	Pigeonpea	350	875
	Karnataka	Greengram	120	300
	Karnataka	Blackgram	70	175
Total (b)			540	1350
Rabi 2019 -20	Karnataka	Chickpea	360	900
	Karnataka	Greengram	20	50
	Karnataka	Blackgram	20	50
	Kerala	Blackgram	10	25
	Total (c)			410
Grand total (a + b + c)			1330	3325



3.2.2 Cluster Frontline Demonstrations (CFLDs) on Oilseeds under NMOOP

ICAR-ATARI, Bengaluru implemented Cluster Frontline Demonstrations (CFLDs) on oilseeds under NMOOP sanctioned by Department of Agriculture, Co-operation & Farmers Welfare through ICAR, New Delhi with an aim to enhance the production of oilseeds in the country. During the period, 1075 demonstrations on groundnut, soybean, sunflower, niger, linseed and sesame crops were conducted by KVKs of Karnataka and Kerala in 430 ha of farmers fields and details are presented in Table 102. During summer 2018-19 i.e first quarter of 2019, a total of 500 demonstrations were conducted in 200 ha, out of

which 450 demonstrations on groundnut by KVKs of Karnataka and 50 demonstrations on sesame by KVKs of Kerala. During kharif, a total of 375 demonstrations were conducted by KVKs of Karnataka in 150 ha, out of which, more number of demonstrations were on soybean (175) followed by groundnut (75), sunflower (75), niger (25) and sesame (25). During rabi, a total of 200 demonstrations were conducted by KVKs of Karnataka in 80 ha covering 50 demonstrations on groundnut, 75 demonstrations on sunflower and 75 demonstrations on linseed.

Table 102: CFLDs organized by KVKs of Zone XI on oilseeds under NMOOP

Season	State	Crop	CFLDs on pulses	
			Area (ha)	Demos (No.)
Summer 2018 -19	Karnataka	Groundnut	180	450
	Kerala	Sesame	20	50
Total (a)			200	500
Kharif 2019 -20	Karnataka	Soyabean	70	175
	Karnataka	Groundnut	30	75
	Karnataka	Sunflower	30	75
	Karnataka	Niger	10	25
	Karnataka	Sesame	10	25
Total (b)			150	375
Rabi 2019 -20	Karnataka	Groundnut	20	50
	Karnataka	Sunflower	30	75
	Karnataka	Linseed	30	75
Total			80	200
Grand total (a + b + c)			430	1075



CFLD on sunflower at KVK, Gadag



CFLD on sesame at KVK, Alappuzha



CFLD on soybean at VK, Belagavi-II



CFLD on linseed at KVK, Vijayapura-II



CFLD on mustard at KVK, Raichur



CFLD on groundnut at KVK, Tumakuru-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 & 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 103. Data shows that highest seed production was achieved in chickpea (1636.00 q) followed by pigeonpea (953.40 q), blackgram (312.41 q), greengram (83.75 q) and cowpea (4.10 q). Thus, 2989.66 q of pulses seed were produced by KVKs under seedhubs.

Table 103: Seed production of pulses through seed hubs under NFSM by KVKs of Zone XI

Crop	Varieties	Seed quantity (q)
Chickpea	BGD-103 and JAKI-9218	1636.00
Pigeonpea	TS-3R and GRG-811	953.40
Blackgram	LBG 791 and Rashmi	312.41
Greengram	DGGV2, BGS9 and KKM-3	83.75
Cowpea	KBC-9 and PGCP-6	4.10
Total		2989.66



Seed packing under seed hub at KVK, Bidar



Chickpea crop under seed production at KVK, Kalaburagi-II



Chickpea crop under seed production at KVK, Belagavi-II



Seed processing unit at KVK, Belagavi-II

3.2.4 National Innovations in Climate Resilient Agriculture (NICRA)

National Innovations in Climate Resilient Agriculture (NICRA) is a network project being implemented in the country to develop improved technologies through research and to demonstrate the existing technologies on farmers' fields for enhancing climate resilience. ICAR-ATARI, Bengaluru (Zone-XI) has implemented NICRA in seven most vulnerable districts, namely Belagavi (drought/heat), Davanagere (drought/heat), Chikkaballapura (drought/heat), Tumkur (drought), Gadag (drought/heat) and Kalaburagi (drought/heat) in Karnataka and Alappuzha (water inundation/drainage) in Kerala. Interventions being implemented are based on four modules, i.e. (1) Natural resources management, (2) Crop production, (3) Livestock and fisheries and (4) Institutional interventions including capacity building and extension activities.

Rainfall distribution:

During the reporting year, annual rainfall recorded was highest in Alleppey district of Kerala with 2401.10 mm with distribution of 335.80, 405.50, 566.60 and 292.10 mm in the months of June, July, August and

September, respectively. Only one intensive rain spell of more than 60.00 mm occurred during the month of June and a total of 55 water logging days were recorded from the month of June to September in NICRA villages.

In Hirehalli of Tumkur district of Karnataka, annual rainfall recorded was 765.00 mm followed by two dry spells of more than 10 days in the months of July and August and one dry spell of more than 20 days July month. In Chikkaballapur, four dry spells of more than 10 days, one dry spell each of more than 15 days and more than 20 days with annual rainfall of 670.00 mm was recorded from June to September months. In Davanagere, rainfall received during *Kharif 2019* was 39.70, 117.40, 161.00 and 88.80 mm from June to September months, respectively. Annual rainfall in Belagavi district recorded was 418.20 mm with even distribution. Kalaburagi and Gadag districts received 864.40 and 660.70 mm rainfall during kharif season of 2019 respectively with fairly good distribution. Details are provided in Table 104.

Table 104: Rainfall scenario in NICRA cluster villages of Zone-XI

KVK	Month	Kharif 2019 Rainfall received in (mm)/Rainy days	Dry spells inkharif 2018 (No.)			Intensive rain spells in 2019 (No.)	
			>10days	>15days	>20days	>60 mm per day	Water logging observed (Days)
Alappuzha	June	335.80	0	0	0	1	0
	July	405.50	0	0	0	0	0
	August	566.60	0	0	0	0	11
	September	292.10	0	0	0	0	0
	October	416.30	0	0	0	1	0
	November	179.40	0	0	0	0	0
	December	82.60	0	1	0	0	0
	Annual	2401.10	0	1	0	2	11

Belagavi-I	June	186.60	0	0	0	0	0
	July	201.20	0	0	0	0	0
	August	279.20	0	0	0	0	0
	September	103.30	1	0	0	0	0
	October	253.20	0	0	0	0	0
	November	8.40	0	0	1	0	0
	December	0	0	0	1	0	0
	Annual	418.20	0	0	0	0	0
Chikkaballapura	June	30.00 (2)	2	0	0	0	0
	July	46 .00(2)	0	0	1	0	0
	August	45.00 (3)	1	1	0	0	0
	September	180.00(3)	1	0	0	0	0
	October	202.00 (8)	0	0	0	0	0
	November	54.00 (3)	1	1	0	0	0
	December	10.00 (1)	1	1	1	0	0
	Annual	670.00	4	3	2	0	0
Davanagere	June	39.70 (4)	0	0	0	0	0
	July	117.4 0 (11)	0	0	0	0	0
	August	161.00 (09)	0	0	0	0	0
	September	88.80 (07)	0	0	0	0	0
	October	194.00 (12)	0	0	0	0	0
	November	10.20 (1)	0	0	0	0	0
	December	0	0	0	0	0	0
	Annual	659.20 (51)	0	0	0	0	0
Gadag	June	80.20 (7)	0	0	0	0	0
	July	116.10 (12)	0	0	0	0	0
	August	167.80 (18)	0	0	0	0	0
	September	89.20 (8)	0	0	0	0	0
	October	200.40 (13)	0	0	0	0	0
	November	7.0 0 (1)	0	0	1	0	0
	December	0	0	0	1	0	0
	Annual	660.70	0	0	2	0	0
Kalaburagi-I	June	100.60	1	0	0	0	0
	July	73.80	0	0	0	0	0
	August	112.60	0	0	0	0	0
	September	168.40	0	0	0	0	0
	October	105.80	1	0	0	0	0
	November	0	0	0	1	0	0
	December	9.20	0	0	1	0	0
	Annual	593.40	2	0	2	0	0
Tumakuru-II	June	152.00 (4)	0	0	0	0	0
	July	47.00 (2)	1	0	1	0	0
	August	96.00 (4)	1	0	0	0	0
	September	145.00 (8)	0	0	0	0	0

Figures in brackets are number of rainy days



A view of flood during monsoon in Alappuzha (KVK, Alappuzha)

Summary of activities under each of four modules under presented in Table 105. NICRA carried out by KVKs during the year are

Table 105: Summary of activities carried out by KVKs under NICRA cluster villages

KVK	NRM		Crop production		Livestock and fisheries		Capacity building		Extension activities	
	Demo (No)	Area (ha)	Demo (No)	Area (ha)	Demo (No)	Animals (No)	Trainings (No)	Farmers (No)	Programmes (No)	Farmers (No)
Alappuzha	120	205.00	72	10.00	92	22	9	170	8	110
Belagavi -I	123	23.08	259	95.00	93	75	8	247	10	512
Chikkaballapura	96	66.00	198	100.20	82	761	7	297	21	581
Davanagere	71	155.70	281	117.00	72	10	10	449	49	1121
Gadag	135	390.05	165	70.05	0	0	13	417	48	1066
Kalaburagi -I	4	150.00	21	6.25	14	12	7	182	7	135
Tumakuru -II	2	8.70	266	81.50	0	0	2	80	6	814
Total	551	998.53	1262	480.00	353	858	56	1842	149	4339

Module wise technologies implemented in NICRA cluster villages are discussed as under.

Module I: Natural Resources Management

Under the module interventions related to resource conservation technologies such as EM composting using aquatic weeds and moisture conservation viz. mulching, compartment bunding, trench cum bunding, broad based furrow, contour trenching, field bunding, tank silt application and green manuring, planting dryland horticultural crops, soil health cards for better

nutrient management were implemented. In order to improve water storage capacity strengthening of water storage structures such as farm ponds and check dams were undertaken. A total of 998.53 ha area has been treated with NRM related treatments covering 773 farmers in order to build climate resilience in NICRA cluster of villages covering seven drought prone districts through 551 demonstrations. Details are presented in Table 106.

Table 106: NRM activities implemented by KVKs in NICRA cluster villages

KVK	NRM activities	Demo (No.)	Area (ha)	Farmers involved (No.)
Alappuzha	Large scale composting of aquatic weeds using EM solution and use for vegetable cultivation in grow bags	20	105.00	40
	Soil health cards	100	100.00	100
	Total	120	205.00	140
Belagavi-I	Mulching (organic/plastic) and sugarcane trash mulching (guava, custard apple and curry leaf)	59	3.18	65
	Compartmental bunding	16	3.20	16
	Improved drainage in flood prone areas through desilting of drainage channel (soyabean and maize)	35	14.10	50
	Composting (sorghum)	7	1.40	7
	Compost culture with waste decomposer	6	1.20	6
	Total	123	23.08	144
Chikkaballapura	Trench cum bunding (finger millet -ML365)	25	10.00	40
	Broad based furrow (pigeonpea-BRG-5)	27	16.00	43
	Contour trenching (pigeonpea -BRG-5)	4	5.00	15
	Soil health cards issued (groundnut)	25	12.00	25
	Tank silt application in (finger millet ML-365)	15	23.00	30
	Total	96	66.00	153
Davanagere	Farm ponds (maize)	4	20.00	4
	Soil health cards issued (maize)	40	87.50	40
	Green manuring in arecanut	25	47.80	25
	Mango (Alphanso)	2	0.40	2
Total	71	155.70	71	
Gadag	Compartmental bunding (rabi sorghum SPV-2217)	80	130.00	105
	Soil health cards issued (maize)	50	260.00	130
	Demonstration on nutri-farms for nutritional security	5	0.05	5
	Total	135	390.05	240
Kalaburagi-I	Field bunding (pigeon pea)	1	100.00	2
	Check dams (pigeon pea)	2	40.00	16
	Tank silt application in cotton crop	1	10.00	5
	Total	4	150.00	23
Tumakuru-II	Dryland horticulture (tamarind)	2	8.70	2
	Total	2	8.70	2
	Grand total	551	998.53	773



Farm pond filled with rain water at KVK, Davanagere



Water oozing out of borewell on its own after complete recharge KVK Gadag



Water flowing in the nalas during rain at KVK, Kalaburagi-I

Module II: Crop production

This module consisting of crop production interventions such as introduction of drought/high temperature tolerant varieties, improved varieties, short duration varieties, crop diversification, high yielding varieties, drought tolerating crop production measures, location specific intercropping systems with high sustainable yield index, cultivation practices to overcome flooded situations, resource conservation,

eco friendly management practices, water saving cultivation methods (aerobic, direct seeding, micro irrigation) and mixed farming systems were implemented. A total of 1262 farmers' demonstrated these technologies in 480.00 ha spread over in seven NICRA districts. District and technology wise details are presented in Table 107.

Table 107: Climate resilient crop production technologies implemented by KVKs under NICRA cluster villages

KVK	Climate resilient crop production technologies	Farmers (No.)	Area (ha)	Yield (q/ha)			BCR (Demo)	BCR (Check)
				Demo	Check	Increase (%)		
Alappuzha	Resource conserving and eco-friendly technologies in paddy cultivation	20	10.00	Ongoing				
	Utilising crop residues for mushroom cultivation	2	4 units	4.50	0		1.90	-
	Climate resilient ICM in coconut	50	400 palms	Ongoing				
	Total	72	10.00					
Belagavi-I	Short duration varieties: Black gram (DBGV-5), Yadagud	78	31.20	10.96	8.19	33.82	2.80	2.09
	Short duration varieties: Black gram (DBGV-5), Ammanagi	46	18.40	11.11	8.16	36.15	2.84	2.11
	Short duration varieties: Pigeon pea (Yadagud)	28	6.48	10.80	8.13	32.84	2.81	2.19
	Short duration varieties: Pigeon pea (Ammanagi)	7	1.52	10.45	8.34	25.29	2.71	2.24
	Drought tolerant varieties: Foxtail millet (Yadagud)	44	18.60	6.73	5.20	29.42	2.27	1.79
	Drought tolerant varieties: Foxtail millet (Ammanagi)	21	4.70	5.98	4.35	37.47	2.23	1.62
	Improved drainage in soyabean (JSS-335)	20	9.60	21.25	18.25	16.43	2.80	2.40
	Improved drainage in maize (CP-418)	15	4.50	45.00	41.25	9.09	2.45	2.24
	Subtotal	259	95.00					

Chikkaballapura	Drought tolerant varieties: Finger millet (ML-365)	85	40.00	28.90	26.70	8.23	3.09	2.80
	Pigeonpea (BRG-5)	10	11.20	14.98	13.00	15.23	2.64	2.45
	Fox tail millet (Navane R.S.-118)	4	6.00	13.75	12.21	12.61	2.15	1.99
	Contingency crops: Horsegram (PHG-9)	93	42.00	13.40	12.50	7.20	2.26	2.16
	Crop diversification: Cowpea (KC-8)	6	1.00	12.95	11.88	9.06	2.30	2.10
Subtotal		198	100.20					
Davanagere	Drought tolerant/improved variety : Finger millet (ML-365)	20	8.00	28.50	24.90	14.45	2.43	2.22
	Location specific intercropping systems : Maize + redgram (BRG-5)	230	92.00	49.31	42.50	16.02	1.89	1.70
	Nutrient spray during drought in maize	25	12.00	47.80	39.80	20.10	1.90	1.60
	Drip irrigation in tomato (private hybrid)	2	2.00	545.50	487.00	12.01	3.28	3.05
	Mixed farming systems : Maize + pigeonpea in finger millet, fodder crops, mango	2	2.00	49.00	44.50	15.00	1.95	1.63
	Finger millet (ML-365)	2	1.00	27.38	24.90	9.95	2.13	2.05
Subtotal		281	117.00					
Gadag	Drought tolerant variety: Rabi sorghum (SPV-2217)	80	32.00	9.37	6.50	44.15	1.85	1.37
	Drought tolerant variety: Bengalgram (JAKI9218)	10	4.00	8.75	6.10	43.44	1.53	1.33
	Location specific intercropping systems demonstrated in Maize + pigeonpea (TS-3R)	50	20.00	31.61	23.46	34.73	2.38	1.95
	Intercropping of foxtail millet + pigeonpea in marginal lands	20	8.00	17.89	7.69	132.63	1.53	1.25
	Intercropping of bajra + pigeonpea in medium fertile lands	5	2.00	25.56	10.75	137.76	2.17	2.00
Total		165	70.05					
Kalaburagi-I	Intercropping: Cotton (NarmadA 1125) + methi (vegetable)	3	1.00	35.00	21.00	30.00	3.90	3.00
	Location specific intercropping systems: Pigeonpea + greengram	4	2.00	26.25	10.00	20.00	2.30	1.90
	Apiculture (sunflower)	4	2.00	8	6.00	25.00	2.50	1.90
	Apiculture (honey box)			10 kg/box	7 kg/box	30.00	1.60	0
	Drum stick (Bhagya)	5	1.00	300	250.00	16.00	5.00	0
	Lime plants (Balaji)	5	0.25	60	55.00	8.00	4.40	0
Total		21	6.25					
Tumakuru-II	Short duration variety of pigeonpea (BRG-2)	64	15.00	11.47	9.64	18.98	2.06	1.76
	Drought tolerant/improved varieties of finger millet (ML-365)	91	46.00	25.71	18.58	38.37	2.68	2.00
	Aerobic paddy (Paustic-9)	18	7.00	38.43	29.72	29.31	2.27	1.81
	Aerobic paddy (Tripura dhan-1)	1	0.10	35.62	29.72	19.85	2.14	1.81
	Contingency crops: Foxtail millet (DHFT 109-3)	4	0.40	5.2	-	-	2.01	-
	Location specific intercropping systems: Finger millet + pigeonpea	78	12.00	25.13	25.71	4.01	2.77	2.68
	Income generation activity: French bean (Arka Suvudha)	10	1.00	80.33	65.17	23.26	3.21	2.66
	Total		266	81.50				
Grand total		1262	480.00					



Aerobic paddy Paustic-9 at KVK, Tumakuru-II



Blackgram var DBGV-5 demo plot at KVK, Belagavi-I



Mixed dryland horticulture at Gadag



Drought tolerant bengalgram -JAKI-9218 at KVK, Gadag



Bajra+Pigeonpea intercropping (KVK Gadag)

Climate resilient varieties

Climate resilient varieties emerged under NICRA demonstrations suiting these drought prone districts such as blackgram (DBGV-5), cowpea (KC-8), finger millet (ML-365), foxtail millet (DHft-109-3, R.S.-118), kodo millet (local), little millet (CO-2), perennial fodder crop (CoFS-29/31), pigeonpea (TS-3R, BRG-2 and BRG-5) have been incorporated in *Kharif-2019* plan of state agriculture department and covered 51.00 ha, 101.00 ha, 6025.00 ha, 1654.40 ha,

59.00 ha, 760.00 ha, 103.00 ha and 14726.50 ha, respectively. Climate resilient varieties emerged for rabi season namely, bengalgram (JAKI-9218) and rabi sorghum (SPV-2217, M-35-1) have been incorporated in *Rabi 2019* plan of state agriculture department and implemented in 25000.00 ha and 15078.00 ha, respectively. A total of 63857.90 ha has been brought under climate resilient varieties through state department of agriculture in

Belagavi, Chikkaballapura, Davanagere, Gadag,
Kalaburagi and Tumakuru districts of Karnataka.

Details are presented in Table 108.

Table 108: Popularization of climate resilient varieties emerged from demonstrations under NICRA through *kharif* and *rabi* plans of state agriculture department

Crop	KVK	Climate resilient varieties incorporated in the plan of state agriculture department (Varieties)	Approximate area brought under the variety by state agriculture department (ha)
<i>Kharif</i> 2019			
Blackgram	Belagavi-I	DBGV-5	51.00
Cowpea	Chikkaballapura	KC-8	101.00
Finger millet	Chikkaballapura	ML-365	2360.00
	Davanagere	ML-365	300.00
	Tumakuru-II	ML-365	3365.00
Fox tail millet	Belagavi-I	DHFt-109-3	4.40
	Gadag	DHFt-109-3	1200.00
	Chikkaballapura	R.S.-118	450.00
Kodo millet	Chikkaballapura	Local	59.00
Little millet	Chikkaballapura	C.O-2	760.00
Fodder crop	Davanagere	CoFS-29/31	40.00
	Chikkaballapura	COFS-31	63.00
Pigeonpea	Belagavi-I	TS-3R	35.00
	Kalaburagi	TS-3R	300.00
	Gadag	TS-3R	2834.00
	Tumakuru-II	BRG-2	4500.00
	Chikkaballapura	BRG-5	4500.00
	Davanagere	BRG-5	2857.50
Total			23779.90
<i>Rabi</i> 2019			
Rabi Sorghum	Gadag	SPV-2217	15000.00
	Belagavi-I	M,35-1	78.00
Bengalgram	Gadag	JAKI-9218	25000.00
	Total		40078.00
Grand total			63857.90

Module III: Livestock and Fisheries

Preventive vaccination and heat stress management in livestock through nutrition and improved shelter, introduction of improved breeds, improved fodder/feed storage methods, improved shelters for reducing heat stress in livestock, 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. Details are furnished in Table 109. During the year,

about 880 livestock including poultry birds have been covered under various livestock interventions through 353 demonstration units to tackle the adverse climatic conditions in the NICRA villages. Under general health check-up, preventive vaccination and deworming in livestock and poultry birds were under taken during the year.

In poultry, backyard poultry breeds, slatted poultry shelter for floods and feed supplementation were implemented. In order to enhance the heat stress and nutrition in livestock, 233 mineral mixture

supplementation demonstrations were implemented. In fisheries, common carp fish rearing was introduced in two farm ponds during the year.

Table 109: Climate resilient technologies on livestock and fisheries implemented by KVKs under NICRA cluster villages

KVK	Climate resilient technologies on livestock and fisheries	Demonstrations (No)	Animals/birds treated (No)/ Area
Alappuzha	Housing of poultry in slatted floor, feeding and disease control programme	10	10 units
	Improved shelters for reducing heat stress/ cold stress/ water logging/ flood and diseases in goat	7	7 units
	Integrated Farming System	5	5 units
	Improved feeding like location specific mineral mixtures or mineral bricks	20	-
	Prevention and control of diseases in dairy farming	50	-
Belagavi-I	Improved fodder/feed storage methods (silage/ hay)	13	0.02 ha
	Improved feeding like location specific mineral mixtures or mineral bricks	75	75 animals
	Automatic water dispenser	5	-
Chikkaballapura	Preventive vaccination (number of animals involved)	41	761 animals
	Improved feeding like location specific mineral mixtures or mineral bricks	41	150 mineral mixture packets
Davanagere	Management of fish ponds / tanks during water scarcity and excess water	2 village ponds, 2 SHGs	20000 fingerlings
	Enrichment of poor quality dry fodders	50	50 t
	Introduction of improved breeds (no. of animals involved)/ poultry/ fish	10	-
	Improved feeding like location specific mineral mixtures or mineral bricks	10	10 animals
Kalaburagi-I	Improved shelters for reducing heat stress/ cold stress/ water logging/ flood and diseases in livestock	9	9 animals
	Introduction of improved breeds (no. of animals involved)/ poultry/ fish	5	3 animals
	Total	353	



Fish harvest from the fish pond (KVK, Kalaburagi-I)



Animal health camp (KVK, Chikkaballapura)

Module IV: Institutional interventions

As a part of development of institutional mechanisms to take care of overall implementation of NICRA at village level, activities relating to seed bank, fodder bank, custom hiring centre, introduction of weather index based insurance and climate literacy through a village weather station were established. Thirteen units of seed banks to meet the drought and flood related

issues were established and maintained at three NICRA villages. In respect of custom hiring centres, 228 farmers of NICRA cluster villages have used various implements to cultivate 201.50 ha for timely sowing and other cultural operations. Details are presented in Table 110.

Table 110: Institutional interventions implemented by KVKs under NICRA cluster villages

KVK	Type of institutional intervention	Interventions (No.)	Farmers (No.)	Area/Unit
Alappuzha	Seed bank (vegetables)	1	36	1 unit
Belagavi -I	Seed bank (wheat, sorghum , chickpea)	1	132	6 units
Chikkaballapura	Custom hiring centre	26	50	16.50 ha
	Climate literacy through a village level weather station	1	640	
Davanagere	Custom hiring centre	12	48	73.50 ha
	Climate literacy through a village level weather station	25	230	
Gadag	Seed bank	5	151	6 units
	Custom hiring centre	82	82	92.50 ha
Kalaburagi	Custom hiring centre	5	20	15.00 ha
Tumakuru -II	Custom hiring centre	2	28	4.00 ha
	Climate literacy through a village level weather station	1	265	
	Total	161	1682	201.50 ha 13 units

Extension activities:

During the year, 149 extension activities have been carried out to create awareness among farming community about the climate related impacts on agriculture and related sector through 9 different activities. A total of 4339 farmers have involved through their participation in these programmes

including 1106 women farmers (Table 111). About 500 farmers including 219 women farmers were taken on exposure visits to various technology demonstration units/institutions by NICRA KVKs

Table 111: Extension activities organized by KVKs under NICRA cluster villages

Type of extension activity	KVKs (No.)	Extension activities (No.)	Farmers (No.)		
			Male	Female	Total
Exposure visits	5	13	281	219	500
Diagnostic visit s	2	8	122	15	137
Method demonstrations	6	23	300	138	438
Agro advisory services	4	64	342	64	406
Field days	3	5	384	22	406
Group discussion	3	10	136	49	185
Awareness programmes	5	18	1267	426	1693
Kisan melas	3	5	365	159	524
Campaingns	1	3	36	14	50
Total		149	3233	1106	4339



Awareness programme on FAWM in Yadagud village (KVK, Belagavi-I)



Krishi Mela at NICRA village for the students and farmers (KVK Chikkaballapur)

Fodder production:

A total of 291 demonstrations were organized on fodder production covering 48.30 ha in which 236 demonstrations on drought tolerant multicut sorghum, 15 on silage making technology and 40 on fodder

production (Agethi - *Sesbania grandiflora*) were conducted at farmers' fields of NICRA cluster villages. Details are presented in table 112.

Table 112: Demonstrations on climate resilient technologies for fodder production conducted by KVKs under NICRA cluster villages

KVK	Name of climate resilient technology for fodder production	Demonstrations (No.)	Area (ha)	Total production (q)
Belagavi -I	Introduction of new fodder crops or new varieties	25	2.50	144.00
	Improved fodder/feed storage methods (silage/ hay)	10	5.00	50.00
Chikkaballapura	Introduction of new fodder crops or new varieties	30	2.00	1600.00
Gadag	Introduction of new fodder crops or new varieties (fodder production and azolla)	10	10.00	63.72
Davanagere	Introduction of new fodder crops or new varieties cultivation of CoFS - 29/31 drought tolerant perennial fodder crop	112	11.20	364000.00
Kalaburagi -I	Improved fodder/feed storage methods (silage/ hay)	5	5.00	1000.00
Tumakuru -II	Introduction of new fodder crops or new varieties multi cut sorghum CoFS -29	53	8.00	1410.40
	Introduction of new fodder crops or new varieties multi cut sorghum CoFS -31	6	0.60	177.12
	<i>Sesbania grandiflora</i>	40	4.00	-
Total		291	48.30	



Multicut sorghum CoFS-29 (KVK, Tumakuru-II)



Dry fodder enrichment (KVK, Davanagere)

Capacity building to farmers

NICRA KVKs have conducted 56 specialised training courses related to climate resilient agriculture in crop production, natural resource management, livestock, ICM, INM, IPDM, value addition and dry

land technologies by the participation of 1842 farmers including 481 women farmers. Details are provided in Table 113.

Table 113: Specialised training courses conducted by KVKs for farmers of NICRA cluster villages

Thematic area	KVKs (No.)	Specialised training courses (No.)	Farmers (No.)		
			Male	Female	Total
Crop production	3	12	325	80	405
Natural Resource Management	2	3	47	44	91
Livestock and fisheries	4	7	114	71	185
Dry land horticulture		3	76	10	86
Dry land technologies in field crops	1	1	46	0	46
Value addition	2	3	31	74	105
Integrated crop management	2	4	133	6	139
IPM and IPDM	2	2	45	9	54
Integrated Nutrient Management	2	6	187	53	240
Agronomic production technologies	1	2	45	20	65
Animal husbandry	1	2	23	7	30
Improved crop varieties	1	1	35	5	40
Jal Shakti Abhiyan	1	1	35	5	40
Plant protection for agriculture crops	1	2	50	15	65
Drought management	1	3	30	25	55
Intercropping system	1	1	32	0	32
Weed management	1	1	63	1	64
Clean milk production	1	1	0	48	48
Soil and water conservation	1	1	44	8	52
Total		56	1361	481	1842

3.2.5 Skill Development Programme

A total of 51 skill development training programs were conducted by 26 KVKs and trained 996 participants (Table 114). Out of which, 18 KVKs in

Karnataka conducted 33 training programmes with 666 participants and 8 KVKs in Kerala conducted 18 training programmes with 330 participants.

Table 114 : State wise skill development training programmes conducted by KVKs of Zone-XI

State	KVKs (No.)	Training programmes (No.)	Participants (No.)
Karnataka	18	33	660
Kerala	8	18	330
Total	26	51	990

(a) Karnataka

Skill development training programmes were conducted by KVKs on 14 different job roles and details of which are presented in Table 115. Data indicates that friends of coconut tree and dairy farm entrepreneur were the major job roles on which skill training was conducted with 6 and 5 programmes, respectively. Organic grower with 4 training

programmes, followed by nursery worker and mushroom grower with 3 training programmes each, bee keeper, mango grower and vermicompost producer with 2 training programmes each and remaining job roles with one training programme each were organized during the year.

Table 115: Job role wise skill development training programmes conducted by KVKs of Karnataka

Type of job role	Skill development training	
	Programmes (No.)	Participants (No.)
Bee keeper	2	40
Coconut grower	1	20
Dairy farmer – entrepreneur	5	100
Dairy management	1	20
Friends of coconut tree	6	123
Gardener	1	25
Mango grower	2	42
Mushroom grower	3	58
Nursery worker	3	57
Organic grower	4	81
Quality seed grower	1	20
Sericulturist	1	20
Small poultry farming	1	20
Vermicompost producer	2	40
Total	33	666

(b) Kerala

Skill development training programmes were conducted by KVKs of Kerala on 15 different job roles and details of which are presented in Table 116. Job roles distributed widely as indicated by maximum of 2 training programmes each under friends of

coconut tree, mushroom grower and vermicompost producer. One program each was conducted on other 12 job roles.

Table 116: Job role wise skill development training programmes conducted by KVKs of Kerala

Type of job role	Skill development training	
	Programmes (No.)	Participants (No.)
Agricultural extension service provider	1	20
Artificial Insemination technician	1	20
Assistant gardener	1	20
Beekeeper	1	20
Coconut grower	1	20
Friends of coconut tree	2	40
Micro irrigation	1	20
Mushroom grower	2	40
Nursery worker	1	24
Open floriculture	1	4
Organic grower	1	18
Protected floriculture	1	4
Quality seed grower	1	20
Small poultry farmer	1	20
Vermicompost producer	2	40
Total	18	330



Training on Friends of Coconut Tree at Tumakuru II



Training on Micro Irrigation Technician-Installation at KVK, Ramanagara

3.2.6 Attracting and Retaining Youth in Agriculture (ARYA)

ICAR project on Attracting and Retaining Youth in Agriculture (ARYA) is aimed at entrepreneurial development of youth in rural areas to take up different agriculture, allied and service sector enterprises for sustainable income and gainful employment. ARYA KVKs identified the youth eligible under the scheme, trained them on entrepreneurship development skills and offered a basket of options to start agricultural ventures for self-employment.

KVKs of ICAR-ATARI, Zone-XI viz., Bengaluru

Rural, Uttara Kannada, Shivamogga, Kannur, Pathanamthitta and Malappuram implemented ARYA project and conducted 71 training programmes for rural youth on income generating activities wherein trained 688 participants on various agricultural and allied enterprises viz., vermicomposting, bee keeping, processing and value addition of farm products, mushroom cultivation, poultry, nursery and commercial floriculture and gardening (Table 117). As a result, 158 units have been established (Table 118) and managed by the trained youth.

Table 117: Center wise training programmes conducted for rural youth by KVKs under ARYA project

ARYA KVK Centers	Training programmes (No.)	Rural youth (No.)
Bengaluru Rural	18	78
Kannur	37	470
Pathanamthitta	13	65
Shivamogga	3	75
Total	71	688

Table 118: Enterprise wise rural youth trained by KVKs and enterprises established under ARYA project

Name of enterprises	Rural youth trained (No.)	Units established (No.)
Vermicomposting	35	35
Coconut palm climbing	47	39
Bee keeping	98	37
Processing and value addition of farm products	255	17
Nursery	65	13
Commercial floriculture and gardening	46	2
Processing and value addition of livestock products	14	1
Poultry	38	2
Mushroom production	90	12
Total	688	158

3.2.7 Capacity Building of Farmers on Land Resource Inventory under Sujala III

Farmers capacity building on Land Resource Inventory developed by National Bureau of Soil Survey and Land Use Planning (NBSSLUP), Regional Station Bengaluru under Sujala III project of Government of Karnataka was continued during 2019 also by KVKs of Karnataka in 10 districts. During the year, Tumakuru I was added to the

list of 10 KVKs involved in the project activity during the previous year. During the period, capacity building of 8934 farmers of 201 villages was achieved through 201 training programmes. Thus, the total number of training programmes conducted through KVKs was 347, which was more than the targeted 333 programmes, within the allocated budget.

Table 119: Progress under Sujala III during 2019 and the cumulative progress under the project

Sl.	District	Progress during 2019 (No.)			Cumulative progress under Project (No.)		
		Villages covered	Trainings conducted	Farmers trained	Villages covered	Trainings conducted	Farmers trained
1	Bidar	9	10	300	19	20	600
2	Chamarajanagara	19	20	626	29	30	926
3	Davanagere	50	53	2932	85	87	3483
4	Gadag	45	65	2144	51	75	2444
5	Kalburgi	10	10	130	20	20	580
6	Koppal	6	7	273	9	10	418
7	Raichur	8	15	300	13	20	600
8	Tumakuru-I	14	14	651	14	14	651
9	Tumakuru-II	19	19	723	30	30	1054
10	Vijayapura	13	18	519	23	28	999
11	Yadgir	8	8	336	13	13	696
	Total	201	239	8934	306	347	12451

3.2.8 Awareness Programmes on PPV& FRA

Ministry of Agriculture & Farmers Welfare encourages registration of farmer's varieties of crops under Protection of Plant varieties & Farmers Right Act 2001 (PPV&FRA). 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 varieties in addition to cultivators. 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 & FRA Act. During the period, KVKs Kodagu, and Dharwad in Karnataka and Kozhikode and Wayanad in Kerala, organized awareness programmes through exhibition of plant varieties and

seminars from eminent scientists on PPV & FRA by involving 735 farmers. Officers from state government, agriculture universities and ICAR scientists participated in the programmes.

3.2.9 Swachhta Pakhwada

ICAR-ATARI, Bengaluru has been implementing Swachh Bharat Mission- a nationwide programme for promoting cleanliness of the country since 2 October, 2014. As a part of it Swachhta Pakhwada was observed by the Institute and the KVKs during 16-31 December 2019 and organized several activities by involving 13280 participants. Date and activity wise programmes organized by KVKs of Zone-XI during Swachhta Pakhwada are given in Table 120.

Table 120: Date and activity wise programmes organized by KVKs of Zone-XI during Swachhta Pakhwada

Date	Activities	Participants (No.)		
		Karnataka	Kerala	Total
16.12.2019	Display of banner at prominent places, taking Swachhta pledge, stock taking and briefing of the activities to be organized during the Pakhwada, plantation of trees.	459	295	754
17.12.2019	Basic maintenance: Stock taking on digitization of office records/ e-office implementation. Cleanliness drive including cleaning of offices, corridors and premises.	233	224	457
18.12.2019	Sanitation and SWM Cleanliness and sanitation drive in the villages adopted under the Mera Gaon Mera Gaurav programme by ICAR Institutes/KVKs involving village community.	595	271	866

19.12.2019	Sanitation and SWM Cleanliness and sanitation drive within campuses and surroundings including residential colonies, common market places.	483	238	721
20.12.2019	Stock taking of waste management and other activities including utilization of organicwastes/generation of wealth from waste, polythene free status, composting of kitchen and home waste materials, promoting clean and green technologies and organic farming practices in kitchen gardens of residential colonies /one near by village and proving on the spot technology solution.	590	280	870
21.12.2019	Campaign on cleaning of sewerage and waterlines, awareness on recycling of waste water, water harvesting for agriculture/ horticulture application/ kitchen gardens in residential colonies/1-2 near by villages	548	210	758
22.12.2019	Organizing workshops, debate, exhibitions, technology demonstrations on agricultural technologies for conversion of waste to wealth, safe disposal of all kinds of wastes.	130	381	511
23.12.2019	Celebration of special day-kisan diwas (farmer's day) on 23 December involving farmers.	3760	219	3979
24.12.2019	Swachhta Awareness at local level (organizing sanitation campaigns involving and with the help of the farmers, farm women and village youth in new villages not adopted any by institutes/establishments.	700	161	861
25.12.2019	Cleaning of public places, community market places and/or nearby tourist/ selected spots.	120	59	179
26.12.2019	Fostering healthy competition: Organizing competition and rewarding best offices/ residential areas/campuses on cleanliness. Quiz, assay and drawing competitions for school children and village youth.	369	117	486
27.12.2019	Awareness on waste management and other activities including utilization of organic wastes/generation of wealth from waste, polythene free status, composting of kitchen and home waste materials, promoting clean and green technologies and organic farming practices in new area.	654	129	783

28.12.2019	Campaign on cleaning of sewerage and water lines, awareness on recycling of wastewater, water harvesting for agriculture/ horticulture application/ kitchen gardens in residential colonies outside campuses/nearby villages with the involvement of local/ village communities.	395	146	541
29.12.2019	Visits of community waste disposal sites/ compost pits, cleaning and creating awareness on treatment and safe disposal of bio-degradable/non-bio-degradable wastes by involving civil/ farming community.	165	75	240
30.12.2019	Involvement of VIP/ VVIP in the Swachhta activities, involvement of print and electronic media may be ensured so that adequate publicity is given to the Swachhta Pakhwada.	423	216	639
31.12.2019	Organization of press conference for highlighting the activities of Swachh Bharat Pakhwada by involving all stakeholders including farmers/VIPs/ press and electronic media.	382	253	635
Total		10006	3274	13280



Awareness programme for high school students on effective utilization of agriculture waste by vermi-composting at KVK, Chamarajanagar



Swachhata oath by KVK, Ramnagara

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

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; ICAR-CTCRI, 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.

These teams extended advisory services as well as allied sectors through organization of 309 activities with the participation of 101235 farmers disseminated latest technologies in agriculture and other stakeholders in 565 adopted villages. Activities included mobile based advisories, distribution of extension literature, team visit to villages, interface meeting/goshties, awareness programmes, method demonstrations, training programmes, facilitating linkages with other agencies, introduction of new technologies, new varieties and new crops.



ICAR-CTCRI, Trivandrum scientists inspecting farmers field in MGMG village



ICAR-CTCRI, Trivandrum awareness programme in MGMG village



ICAR-IIHR, Bengaluru scientist team examining guava orchard affected by wilt at MGMG village



ICAR-IIHR, Bengaluru awareness camp on soil health at MGMG village



Visit of scientists in demonstration field in MGMG village (ICAR-NBAIR, Bengaluru)



Demonstration on use of pheromone traps to the farmers of MGMG village (ICAR-NBAIR, Bengaluru)



Calendars provided to MGMG farmers (ICAR- NIANP, Bengaluru)



Fodder grown with the technical support and seed provided in MGMG village (ICAR- NIANP, Bengaluru)



Awareness about rabies prevention and control to school children in MGMG village (ICAR-NIVEDI, Bengaluru)



Awareness on single use plastic and swachhta to school children in MGMG village (ICAR-NIVEDI, Bengaluru)

3.2.11 District Agricultural Meteorological Units (DAMU)

Indian Meteorological Department (IMD) is establishing District Agricultural Meteorological Unit (DAMU) at KVKs under the scheme Gramin Krishi Mausam Sewa in the country. In pursuance of this, IMD has sanctioned 16 DAMUs for Karnataka (12), Kerala (3) and Lakshadweep (1) under ICAR-ATARI, Bengaluru during Phase-I. These DAMUs are multidisciplinary units responsible for preparation and dissemination of district and sub-district agro-met advisories. Recruitment of contractual staff under DAMUs has been completed in all KVKs and hands

on training to the staff of 6 KVKs was provided during the year. Preparation and dissemination of agro-met advisories has been initiated. A total of 139959 farmers have been registered for receiving agro advisories. During the period, the DAMU centres sent 539 agro advisories to 86505 farmers. DAMUs also have conducted 34 awareness programmes by involving 2005 farmers. KVK wise progress of DAMU under ICAR-ATARI, Bengaluru is given in Table 121.

Table 121: KVK wise progress of DAMU under ICAR-ATARI, Bengaluru

KVK	Agro-met advisory services			Farmers awareness	
	Advisories (No.)	Farmers registered (No.)	Farmers benefitted (No.)	Programmes (No.)	Farmers benefitted (No.)
Kodagu	51	2240	6789	11	632
Koppal	4	1252	1252	1	51
Bagalkot	0	55000	0	-	-
Haveri	5	25	25	-	-
Ramanagara	11	44052	44052	-	-
Tumakuru -I	172	19082	19082	-	-
Chikkamagaluru	25	11083	1332	13	726
Mandya	152	70	70	-	-
Chamarajanagara	85	203	105	-	-
Yadgir	2	55	48	-	-
Bellary	2	150	150	1	55
Raichur	8	2350	11200	1	188
Kolar	5	0	0	-	-
Karnataka total	522	135562	84105	27	1652
Kollam	4	840	0	-	-
Mallapuram	9	2400	2400	5	280
Palakkad	4	1120	0	1	40
Kerala total	17	4360	2400	6	320
Lakshadweep	0	37	0	1	33
Zone total	539	139959	86505	34	2005

3.2.12 Fertilizer Application Awareness Programme

Imbalanced and excessive use of fertilizers with an intention to increase productivity has created a lot of issues which at present has resulted in deteriorated soil health, health hazard, environmental pollution and insecurity of quality food. Keeping these issues as important to address, the Government and ICAR came together to awaken farmers on the right and judicious use of fertilizers. The event was jointly organized by Ministry of Agriculture & Farmers Welfare and ICAR-KVKs with the help of state governments. Programme aims at disseminating knowledge to farmers on optimum

usage of fertilizer nutrients based on various parameters to sustain agricultural productivity and to make farmers aware of new developments in the field of fertilizer usage and management. As a part of it, KVKs of Zone XI organized fertilizer application awareness programme on 22 October, 2019 and data are presented in Table 122. Data indicate that a total of 5642 personnel participated in fertilizer application awareness programme of which 188 dignitaries participated as Chief Guests and remaining 5236 were farmers.

Table 122: Fertilizer application awareness programme organized by KVKs of Zone-XI

KVK	Participants (No.)		
	Dignitaries (No.)	Farmers (No.)	Total
Karnataka			
Kodagu	6	146	155
Kolar	2	70	72
Belagavi -I	6	158	164
Belagavi-II	5	200	205
Kalaburagi-I	4	83	87
Kalaburagi-II	5	94	99
Koppal	3	55	58
Shivamogga	4	124	128
Haveri	4	115	150
Hassan	3	62	72
Gadag	4	211	215
Chikkaballapura	6	150	156
Chamarajanagara	6	183	189
Uttara Kannada	2	60	69
Bengaluru Rural	3	126	158
Raichur	7	188	226
Yadgir	3	107	128
Bagalkot	11	40	51
Dharwad	3	58	61
Davanagere	8	244	252
Vijayapura - I	4	60	60
Vijayapura - II	2	68	70
Ballari	6	71	77
Tumakuru - I	6	81	87
Tumakuru-II	5	142	147
Udupi	5	95	95
Bidar	1	153	165
Ramanagara	3	103	106

Dakshina Kannada	1	29	46
Mysuru	4	110	120
Mandya	4	82	86
Chikkamagaluru	7	285	292
Chitradurga	8	105	113
Total	151	3858	4159
Kerala			
Pathanamthitta	2	40	42
Calicut	0	91	101
Idukki	7	183	190
Trivandrum	1	64	79
Kannur	4	70	81
Palakkad	3	128	142
Ernakulam	2	151	153
Kottayam	5	64	76
Kasaragod	3	198	220
Kollam	2	40	42
Wayanad	2	69	71
Alleppey	0	45	45
Thrissur	4	139	143
Malappuram	2	96	98
Total	37	1378	1483
Grand total	188	5236	5642



Fertilizer application awareness programme organized by KVK, Thrissur



Fertilizer application awareness programme organized by KVK, Kottayam



Fertilizer application awareness programme organized by KVK, Belagavi-II



Fertilizer application awareness programme organized by KVK, Chikkamagaluru



Fertilizer application awareness programme
aorganized by KVK, Dharwad



Fertilizer application awareness programme
organized by KVK, Bengaluru Rural

3.2.13 Jal Shakti Abhiyan

Inspired by the Hon'ble Prime Minister's impetus on Jal Sanchay, the Jal Shakti Abhiyan (JSA) is a time - bound, mission-mode water conservation campaign to cover 256 districts across nation. The JSA ran in two phases: Phase-I ran through farmers participation during the monsoon (1 July- 15 September 2019) for all states and union territories and Phase-II ran from 1 October to 30 November for states and union territories receiving the northeast retreating monsoons. The JSA has focused on five interventions viz., water conservation and rainwater harvesting, renovation of traditional and other water bodies, reuse of water and recharging of structures, watershed development, and intensive afforestation with an emphasis on 1592 stressed blocks in 256 districts. Conservation efforts were supplemented by initiatives like developing block and district water extension personnel (28 male and 15 female), conservation plans

and Krishi Vigyan Kendra Melas' to promote efficient water use for irrigation and better crop choices. As a part of it, KVKs of Zone-XI organized JSA during the reporting period and data are presented in Table 123. A total of 33343 farmers (23783 male and 9560 female) and 2608 extension personnel (male 1727 and 881 female) participated in JSA organized by KVKs of Zone-XI. Out of which, 26198 farmers (19193 male and 7005 female) belonging to general category, 5895 SC/ST farmers (3720 male and 2175 female) and 2565 extension personnel (1699 male and 866 female) participated in Karnataka. The corresponding details for Kerala was 1167 general farmers (824 male and 343 female), 83 SC/ST farmers (46 male and 37 female) and 43 extension personnel (28 male and 15 female).

Table 123: Details of participation in the Jal Shakti Abhiyan organized by KVKs of Zone-XI

State	Participants in Jal Shakti Abhiyan								
	General farmers (No.)			SC/ST farmers (No.)			Extension personnel (No.)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	19193	7005	26198	3720	2175	5895	1699	866	2565
Kerala	824	343	1167	46	37	83	28	15	43
Total	20017	7348	27365	3766	2212	5978	1727	881	2608

	
<p>Jal Shakti Abhiyan organized by KVK, Belagavi-II</p>	<p>Jal Shakti Abhiyan organized by KVK, Chikkaballapura</p>
	
<p>Jal Shakti Abhiyan organized by KVK, Tumakuru-II</p>	<p>Jal Shakti Abhiyan organized by KVK, Davanagere</p>

3.2.14 National Animal Disease Control Programme (NADCP) Campaign

As part of the launching of National Animal Disease Control Programme (NADCP) for foot and mouth disease (FMD) and brucellosis, nationwide artificial insemination programme by the Hon'ble Prime Minister of India on 11 September, 2019, the KVKs were actively involved across the country. Programme aims at vaccinating over 500 million livestock including cattle, buffalo, sheep, goats and pigs against the FMD and vaccinating 36 million female bovine calves annually against the brucellosis disease. Since it is 100% funding from the central government, a budget of Rs. 12652 crore has been earmarked for a period of five years till 2024. Programme has two components, first for controlling the diseases by 2025 and the second for eradication by 2030. Nationwide workshops were organized by KVKs across the districts of the country on vaccination, disease management, artificial insemination (AI) and animal productivity.

KVKs of Zone-XI conducted technical sessions on the importance of vaccination and its role in disease management along with AI and its importance in animal productivity. As part of the programme, 1259 animals (1201 in Karnataka, 42 in Kerala and 16 in Lakshadweep) were treated with vaccination and AI. KVKs also organized NADCP campaign and data on the participants is presented in Table 124. Data shows that 4433 farmers (3593 male and 840 female) and 625 extension personnel (499 male and 126 female) were involved. Out of which, 3258 general farmers (2753 male and 505 female), 799 SC/ST farmers (606 male and 193 female) and 581 extension personnel (470 male and 111 female) participated in Karnataka; 332 general farmers (212 male and 120 female), 44 SC/ST farmers (22 male and 22 female) and 44 extension personnel (29 male and 15 female) participated in Kerala. Besides, literature on management of foot and mouth disease and brucellosis disease were provided to farmers.

Table 124: NADCP campaign organized by KVKs in Zone-XI

State	Partici pants in NADCP campaign								
	General farmers (No.)			SC/ST farmers (No.)			Extension personnel (No.)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	2753	505	3258	606	193	799	470	111	581
Kerala	212	120	332	22	22	44	29	15	44
Total	2965	625	3590	628	215	843	499	126	625



Participants watching the live telecast of the inauguration of NADCP programme by Hon'ble Prime Minister at KVK, Gadag



Artificial insemination programme organized by KVK, Belagavi-II



Vaccination programme organized by KVK, Chitradurga



Launching of vaccination programme at KVK, Raichur



Artificial insemination programme organized by KVK, Idukki



Vaccination campaign organized by KVK, Thrissur

3.2.15 Tree Plantation Campaign Sponsored by IFFCO

On the occasion of 69th birthday of Prime Minister Shri Narendra Modi, Indian Farmers Fertilizer Cooperation Ltd (IFFCO) started a nationwide tree plantation campaign on 17 September, 2019. The IFFCO sponsored campaign was implemented by the KVKs across India. All state offices of IFFCO actively supported the event wherein nearly seven lakh saplings were planted. Saplings planted at the campaign were a mix of fruit trees and neem trees which can help in increasing green cover as well as a source of income for the farmers. In Zone-XI, 19213 plants (13269 in Karnataka and 5944 in Kerala) were planted and data on participant farmers is presented in Table 125. Data shows

that a total of 5560 farmers (3707 male and 1853 female) and 1015 extension personnel (638 male and 377 female) participated in tree plantation campaign organized by KVKs of Zone-XI. Out of which, 3093 general farmers (2287 male and 806 female), 1690 SC/ST farmers (991 male and 699 female) and 961 extension personnel (606 male and 355 female) participated in Karnataka; and 646 general farmers (374 male and 272 female), 131 SC/ST farmers (55 male and 76 female) and 54 extension personnel (32 male and 22 female) participated in Kerala.

Table 125: Details of participation in the tree plantation campaign organized by KVKs of Zone-XI

State	Participants in Tree plantation campaign (IFFCO)								
	General farmers (No.)			SC/ST farmers (No.)			Extension personnel (No.)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	2287	806	3093	991	699	1690	606	355	961
Kerala	374	272	646	55	76	131	32	22	54
Total	2661	1078	3739	1046	775	1821	638	377	1015





Inauguration of tree plantation campaign
at KVK,Kozhikode



Supplying tree saplings to students
at KVK, Pathanamthitta

3.2.16 Paramparagat Krishi Vikas Yojna

The Paramparagat Krishi Vikas Yojana (PKVY), a sub-component of Soil Health Management (SHM) scheme under National Mission on Sustainable Agriculture (NMSA) aims at development of sustainable models of organic farming through a mix of traditional wisdom and modern science to ensure long term soil fertility build-up, resource conservation and helps in climate change adaptation and mitigation.

It primarily aims to increase soil fertility and thereby helps in production of healthy food through organic practices without the use of agro-chemicals. PKVY also aims at empowering farmers through institutional development through clusters approach not only in farm practice management, input production, quality assurance but also in value addition and direct marketing through innovative means. Participatory Guarantee System under PGS-India programme will be the key approach for quality assurances under the PKVY. The farmers will have option to adopt any form of organic farming in compliance

of PGS-India standards. The system adopted was compatible to the area and the identified crop wherein optimum yield was assured through adequate measures to manage nutrients, pests and diseases. Farmers were given the flexibility to use appropriate package of practice(s) best suited to their situations. According to the scheme, farmers were encouraged to form groups or clusters with about 50 farmers willing to take up organic farming in a total area of at least 50 acres. Each participant farmer enrolling in the scheme will be provided assistance worth ₹. 20,000 per acre spread over three years' time. This fund can be utilized for obtaining organic seed, harvesting of the crops, and transporting the produce to the local markets.

Department of Agriculture Co-operation & Farmers Welfare has sanctioned the scheme to 40 KVKs in Karnataka and Kerala under ICAR-ATARI, Bengaluru. Village wise activities implemented by KVKs of Zone-XI under PKVY are presented in Table 126.

Table 126: Village wise activities implemented by KVKs of Zone-XI under PKVY

KVK	Villages (No)	Name of cluster village	Facilities created for organic source of manure	Name of crops cultivated	Organic inputs applied including bio-agents and botanicals treatment
Karnataka					
Belagavi- 1	1	Bambalwad	Vermi composting unit and liquid bio-fertilizer production unit	Wheat Sorghum, gauva	Seed treatments with biofertilizers, waste decomposer, jeevamrutha, vermicompost, FYM, compost
Bengaluru Rural	1	Karepura	Vermicompost and green manure crop (sunhemp)	Finger millet, maize, cowpea, pole bean, potato	AMC, neem oil, pongamia cake, Azospirillum, PSB
Chikkaballapura	1	Muthukadahalli	Drums for preparation of liquid organic manures	Finger millet, foxtail millet, mango	Neem cake, AMC, sunhemp, seeds, neem oil, PSB
	2	Gunnahalli		Finger millet, foxtail millet, mango	
	3	Alambagiri		Papaya, drumstick	
	4	Battlahalli		Tomato, capsicum, carrot	
	5	Ulawadi		Lemon,	
Chitradurga	1	Madanahole Village, Hiriyur taluk	Vermicompost, compost, biodigester, jeevamrutha, panchagavya and biofertilizers	Summer groundnut	Vermicompost, compost, biodigester, jeevamrutha, panchagavya and biofertilizers
Davanagere	1	Rameshwara	Vermicompost pits, azolla		
Dharwad	1	Halligeri	liquid bio fertilizer production unit	Paddy, maize, soybean	Seed treatments with biofertilizers, waste decomposer, jeevamrutha, glyrecedia, neem oil
Hassan	1	J.Hosahalli	Training on composting farm waste	Paddy	Azolla, humic acid + sea weed extract, sagarika organic N source, cow urine 5%, neem oil

Raichur	1	Yaragunta and Ibrahim doddi (Devasuguru)	FYM, goat manure, sheep manure, vermicompost, jeevamrutha	Onion, cucumber	-
	2	Gurjapura (Devasuguru)	FYM, compost, WDC, vermicompost,, vermiwash, jeevamrutha, panchagavya	Paddy, millets	PSB, Azospirillum, N, P, solubilizers, Pacilomyces, Rhizobium, Trichoderma, Pseudomonas, Metarhizium, Beauveria
	3	Hooganahalli	Neemcake, compost, vermicompost, vermiwash jeevamrutha, panchagavya	Paddy, pigeonpea	Rhizobium, Trichoderma
	4	Chimalapura	FYM, goat manure, sheep manure, WDC and vermicompost, vermiwash, jeevamrutha	Millets, pigeonpea	PSB, Azospirillum, Rhizobium, Trichoderma, Rhizobium, Trichoderma,
Tumukuru -1	1	GunnagereKunigal taluk	Composting coconut palm wastes, growing of mucuna as intercrop in coconut gardens	Coconut	Farm yard manure, neem cake, Trichoderma, Pseudomonas, bio fertilizers, mucuna green manure crop
Uttara Kannada	1	Dodnalli	Green manure crops,, jeevamrutha making unit, forest litter, biofertilizers	Teff	Compost , green leaf manure, diancha, forest litters, Azospirillum, PSB, Pseudomonas, neem oil
	2	Malagi			
Dakshana Kannada	1	Ajjavara, Sullia taluk	-	Arecanut, black pepper, coconut, banana, cocoa, cashew, rice, cowpea, green gram, brinjal	-
	2	Mandekolu, Sullia taluk			
Vijayapura - 1	1	Arakeri	Sunhemp seeds, jeevamrutha	Sorghum	
Koppal	1	Vataparvi	Distribution of mobile vermicompost bags, vermiwash, jeevamrutha, beejamrutha, waste decomposer	Pigeonpea, pomegranate	Vermicompost, Trichoderma, Pseudomonas
	2	Menadhhal			
Shivamogga	1	Yalavatti	Provided plastic barrels for preparation of jeevamrutha, beejamrutha and panchagavya, areca husk composting culture	Arecanut	Copper oxychloride, Azospirillum, areca husk composting culture, neem cake , chelated organic micro-nutrient, PSB

Chikkamagalur	1	G. Hosalli	Vermi composting units; production of liquid bio-fertilizers; use of coffee husk	Pepper, paddy,	Vermi compost, VAM, bacillomycelus, waste decomposer, paccilomyces waste decomposer, Trichoderma, microbial consortium, PSB
	2	Chimmattager			
	3	Gonibeedu			
Gadag	1	Shirahatti	Vermicompost, jeevamruta, beejamurta and panchagavya	Foxtail millet rabi sorghum wheat bengalgram	Seed soaking with jeejamruta @ 5% and seed treated with Trichoderma @ 10 g/Kg, seed treatment with Rhizobium @ 1250 g/ha and PSB @ 1250 g/ha, soil application of vermicompost enriched with jeevamruta @ 2.5 ton/ha, spray of nimbicidine @ 2 ml /l with panchagavya @ 5%, spray of Agni-astra @ 10%, yellow sticky traps @ 8/ha
Bidar	1	Saidapur taluk, Basavkalyan	Vermicompost unit	Bengalgram, blackgram, pigeonpea, greengram soybean, maize, sorghum, vegetables	FYM
Bagalkote	1	Benakatti	Vermicompost, jeevamruth preparation tank and waste decomposer preparation tank	Sorghum	PSB, Trichoderma, Azospirillum, jeevamruth and waste decomposer
Udupi	1	Sanooru, Karkala taluk	FYM	Paddy, arecanut, black pepper	Vermiwash, <i>Pseudomonas</i> , <i>Trichoderma</i> , VAM,
Ballary	1	Bairapura	FYM/compost	Foxtail millet	FYM, compost, <i>Azospirillum</i> , <i>Beauveria bassiana</i> and <i>Nomurea rileyi</i>
Ramanagara	1	Kalya	Earthworms for preparation of vermi compost	Coconut, banana, guava, okra, brinjal, tomato	Neem cake, neem soap, neem oil, MC, fruit fly traps, sticky traps
Kolar	1	Gundammantha	Drums for preparation of liquid organic manures	Mango	Neem based insecticide, fruitfly traps
	2	Bennaguru			
	3	Kothacheruvu			
Mysuru	1	Chakahally H.D.Kote Taluk	Vermicompost FYM	Tomato, chilli, marigold, ginger,	Trichoderma, <i>Pseudomonas</i> , neem oil, bio-fertilizers
Kalaburagi - II	1	Jewargi Rasangi	Training on composting and vermicompost conducted	Pigeonpea, greengram, blackgram, sorghum,	

Mandya	1	Sollepura Maddur taluk	Vermi composting, jeevamruth, FYM enrichment	Paddy, Ragi, Sugarcane, Coconut	Green manures daincha and <i>ex situ</i> pongamia, neem <i>ekka</i> leaves, Enriched compost, jeevamrutha
Yadgir	1	Maskanalli	Vermicompost, farm yard manure, green manuring and waste decomposer	Pigeon pea, groundnut and greengram	Trichoderma, Pseudomonas, PSB, Azospirillum, N, P, solubilizers, neem cake Pacilomyces, Rhizobium, Metarhizium, Beauveria
Haveri	1	Choudadanapur	Sunhemp, Bio fertilizers, Jeevamrutha unit, supply of vermicompost by entrepreneur of the village	Maize, cotton, sugarcane, paddy, jowar, vegetables, bengalgram, groundnut, mulberry	Green manure, jeevamrutha, vermi compost, FYM, compost, bio fertilizers
Kerala					
Alleppy	1	Thazhakkara	FYM	Ginger, turmeric, cowpea, garcinia, snake gourd,	Trichoderma, Pseudomonas, Cue lure trap, Nanma, FAA, Trichoderma,
	2	Chettikulangara	FYM, EM composting	Banana	Nanma, Trichoderma, Pseudomonas
	3	Chennithala		Paddy	Trichoderma, Pseudomonas
Idukki	1	Sandoz SC Colony (KDH Village - Vattavada)	Vermicompost, VAM, organic compost, neem cake	Cabbage	Pseudomonas, Trichoderma, Azospirillum, Phospho bacteria
Pathanamthitta	1	Kulanada	Vermicompost unit,	Cabbage, cauliflower	Pseudomonas, fish aminoacid, Jiveplus
	2	Mezhuvelly			
Palghat	1	Vellinezhi	Green manure, Vrikshayurveda preparations	Paddy Vegetable	<i>Pseudomonas fluorescens</i> , <i>Tricho-card</i> , Trichoderma, Hume plus, Neem garlic chilli soap
	2	Vadakarappathy			
Wayanad	1	Chekadi	Green manure, vermibeds	Cowpea	Trichoderma, Pseudomonas, Rhizobium, Lime
Thrissur	1	Thiruvilwamala	Vermicompost, production of fish amino acid, production of Trichoderma, neem cake, cow dung mixture, production of jeevamrutham, tricho-card installation, application of Pseudomonas	Rice, banana, vegetables	Application of neem cake and vermicompost as major source of manures, jeevamrutha as a growth booster, fish amino acid as pest repellent and growth stimulant, tricho-cards for the control of borers, application of cassava leaf extracts nanma and sreya for sucking pest control, Trichoderma enriched cow dung for disease control

Trivandrum	1	Pothencode (Melethonekk el, Mangalapuram, Pullampara)	Vermicomposting unit	Amaranthus, chilly, bhindi, cucumber, turmeric	Coir pith compost, Pseudomonas, nanma, shreya, cu-lure trap, yellow sticky trap, blue sticky trap, egg amino acid, trichoplus, neem soap, fish amino acid
Kannur	1	Mayyil village (Kadoor),	Vermicompost units (6)	Arrowroot, amorphophallus, turmeric	Pseudomonas – 125 kg, Trichoderma – 127 kg, VAM – 50 kg, neem oil based preparation (neem-x)-5 kg, yellow sticky traps-100 nos, fruit fly traps- 20 nos
	2	Mazhoor village, Kurumathoor Panchayat			
Mallapuram	1	Aliparamba	Vermicompost unit, panchagavya, jeevamrutha, KAU bio bin	Elephant foot yam, vegetables, water melon	Trichoderma, pseudomonas, neem soap, Beauveria
Kozhikode	1	Naduvannur	Vermicomposting / composting facility	Coconut, banana, turmeric, paddy	
	2	Kavunthara			
	3	Kottur			
	4	Avadanalur			
	5	Maruthonkara			
Kasaragod	1	Bambrana	Bio mass recycling, mulching, vermicomposting, <i>in-situ</i> composting	Coconut, arecanut, pepper, rice, vegetables, banana	Cowdung, FYM, ash, greenleaf, Trichoderma, Pseudomonas
	2	Sheny			
Kollam	1	Sooranad North	Vermicompost units, facility for production of organic growth stimulants	Amorphophallus banana, vegetables pulses, paddy	Panchagavya , FYM, neem cake, Pseudomonas, Trichoderma, Beauveria , Verticillium , Metarhizium
Kottayam	1	Akalakkunam Pampady block	Planting of glyricidia vermicomposting unit provided	Rice, tapioca coconut, vegetables, cowpea, grain cowpea	Green gram and grain cowpea seed



Group meeting on PKVY implementation, Halligeri village (KVK, Dharwad)



Organic manure application in PKVY demonstration (KVK Malappuram)

3.2.17 Microirrigation Systems

Water being the most critical input for agriculture, its judicious use is important to ensure sustainable agricultural development and food security. In this direction, Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW), Government of India has been playing a leading role since VIII Plan and 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 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 of 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 of farmers.

As a part of it, eight KVKs viz., Raichur, Yadgir and Wayanad belonging to aspirational districts and Tumakuru-II, Kodagu, Kasaragod, Alappuzha and Kozhikode belonging to ICAR Institutes in Zone-XI were established demonstration units on micro irrigation systems, as per the guidelines provided by the ICAR, in their respective instructional farms which included drip, sprinkler, micro-sprinkler and mist irrigations. Utilizing the micro irrigation units, KVKs conducted seven programmes wherein motivated 1200 farmers to adopt these technologies in their situations. Further, 37 extension personnel visited these demonstration units.

3.3 Farmer FIRST

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 enhanced farmers-scientists interfaces. In this approach, the farmer is in a centric role for research problem identification, prioritization, conduct of experiments and its management in farmers' field conditions. It emphasizes resource management, climate resilient agriculture, production management, storage, marketing, supply chains, value chains, innovation systems and information systems. Project is focused on major activities as under:

- **Enhanced farmers–scientist interfaces:** Involvement of researchers for continuous interaction with farm conditions, problem orientation and quick dissemination and exchange of knowledge between farmers and other stakeholders were dealt.
- **Technology assemblage, application and feedback:** It integrated components of technology for application in different agro-ecosystems with focus on innovations and feedback.
- **Partnership and institutional building:** It involved partnership with different stakeholders, development of rural based institutions, agro-ecosystem and stakeholders analysis and impact studies for data base creation.
- **Content mobilization:** This component dealt with using the platform of the project having commodity institutions as partners to develop commodity specific contents for e-enabled knowledge sharing.

Farmer FIRST Project (FFP) was sanctioned by Division of Agricultural Extension, ICAR, New Delhi and it was implemented through ICAR-ATARI, Bengaluru at 3 institutes viz. ICAR-Central Plantation Crops Research Institute (CPCRI), Kasaragod (implemented at CPCRI Regional Station,

Kayamkulam), ICAR-Indian Institute of Horticultural Research (IIHR), Bengaluru and ICAR- National Institute of Animal Nutrition and Physiology (NIANP), Bengaluru. Brief profile of adopted villages under FFP by these institutes is given in Table 127.

Table 127: Brief profile of adopted villages under FFP

Institute	Adopted villages	Families covered (No.)	Major crops grown	Major enterprises
ICAR-CPCRI Regional Station, Kayamkulam (ICAR-CPCRI, Kasaragod)	Pathiyoor	1000	Coconut, sesamum, vegetables, turmeric, ginger, amorphophallus, colocasia, dioscorea, tapioca, fodder grass, fodder maize, maize, finger millet, horse gram, paddy	Coconut products and value addition units, turmeric powder unit, curry powder, kera probio production, vermicompost production
ICAR-IIHR, Bengaluru	Vasappanadoddi, Yeramgere, Balepura, Kebbedoddi, Hosadurga and Thattiguppe	430	Finger millet, pigeonpea, field bean, tomato, chilli, french bean, tuberose	Dairy, small ruminants, fishery
NIANP, Bangalore	Lekshmidvipura, Timmajanahalli and S. Nagenahalli	500	Ragi, maize, pigeonpea and vegetables	Agriculture and dairying

FFP institutes demonstrated technologies under different modules viz., crop, horticulture, livestock, NRM and IFS. Details on interventions implemented in each module by the institutes at field level are presented in Table 128. Data shows that 1363

demonstrations and 374 extension activities were organized by FFP institutes wherein participated 2136 farm families and 4197 farmers, respectively. Module wise progress of technological interventions is discussed below.

Table 128: Institute wise interventions implemented under FFP

Institute	NRM module		Crop module		Horticulture module		Livestock module			IFS module		Extension activities	
	Dem o (No.)	Fam ilies (No.)	Demo (No.)	Famili es (No.)	Dem o (No.)	Famili es (No.)	Demo (No.)	Famili es (No.)	Ani mals (No.)	Dem o (No.)	Fam ilies (No.)	Progra mmes (No.)	Farm ers (No.)
ICAR - CPCRI Regional Station, Kayamkulam (ICAR - CPCRI, Kasaragod)	148	107	153	220	88	175	35	80	326	40	40	162	1737
ICAR-IIHR, Bengaluru	40	256	560	305	132	119	85	78	273	20	16	101	698
ICAR - NIANP, Bengaluru	4	10	17	77	13	143	24	500	589	4	10	111	1762
Total	192	373	730	602	233	437	144	658	1188	64	66	374	4197

(a) NRM module

Technology wise interventions implemented under NRM module by FFP institutes are presented in Table 129. A total of 592 farmers were involved in demonstrations of improved technologies in 45.60 ha spread over different cluster villages. Demonstration on composting/waste management technology by ICAR-CPCRI RS involved 350 farmers under which

12.00 t of organic waste was recycled. Demonstration on soil and water conservation practices with bore well recharge and related activities were initiated by ICAR-IIHR. Demonstration on soil conservation through bund cultivation in 12.00 ha by ICAR-NIANP involved 62 farmers resulted in reduction of soil erosion.

Table 129: Technology wise interventions implemented under NRM module by FFP institutes

Institute	Intervention / technology	Farmers (No.)	Area (ha)	Measurable indicators	Remarks
CPCRI RS, Kayamkulam (ICAR - CRCRI, Kasaragod) CPCRI Kasaragod	Providing fingerlings to farmers as a part of doubling farmers income	62	4.40	Income from 100 sq.m pond : Rs.22000.00 (Anabas)	Koi Anabas and Nile Thilapia
	Transfer of composting/waste management technology among women groups	350	15.20	Quantity of organic wastes recycled : 12.00 t	Established 15 composting units in homesteads

ICAR-IIHR, Bengaluru	Initiation of soil and water conservation practices and activities on borewell recharge	25	2.00	Prevention of soil erosion through graded slopes, raised bed cultivation and mulching; and drip irrigation to save water and fertigation to save quantity and cost of nutrient application	Impact of borewell recharge is yet to be studied
	Introduction of INM for field and horticulture crops	14	6.00	Saving of cost and reduction in quantity of fertilizers, increase in yield and net income, and increase in quality of produce in horticulture and field crops	Quality of produce enhanced the marketability and market price
ICAR-NIANP, Bengaluru	Soil conservation through bund cultivation	62	12.00	Soil erosion reduction	-
	Transfer of composting/waste management technology	79	6.00	Waste disposal and use of compost as organic manure	-
Total		592	45.60		

(b) Crop module

It consists of introducing improved high yielding varieties, cultivation practices, plant protection measures, high density planting, nutrient management etc. to sustainable production. Technology wise interventions implemented under crop module by FFP institutes are presented in Table 130. A total of 989 farmers were involved in demonstrations of improved technologies on 395.00 ha spread over in different cluster of villages. Demonstration on soil test based nutrition management of root (wilt) disease affected coconut palms by ICAR-CPCRI RS gave yield of

5600 nuts/ha with net return of Rs. 107000.00 as compared to 4200 nuts/ha with net return of Rs. 74000.00 under check. Demonstration on ragi variety ML-365 by ICAR-IIHR gave yield of 35.00 q/ha with net return of Rs. 84000.00 as compared to 20.00 q/ha with net return of Rs. 46000.00 under check. Demonstration on pigeonpea variety BRG-5 by ICAR-NIANP gave yield of 84.00 q/ha with net return of Rs. 109983.00 as compared to 72.00 q/ha under check.

Table 130: Technology wise interventions implemented under crop module by FFP institutes

Institute	Intervention / technology	Farmers (No.)	Area (ha)	Yield			Economics of demo (Rs./ha)		Economics of check (Rs./ha)	
				Demo (q/ha)	Local (q/ha)	Increase (%)	Gross return	Net return	Gross return	Net return
ICAR-CPCRI RS, Kayamkulam (ICAR-CRCRI, Kasaragod)	Soil test based nutrition management of root (wilt) disease affected coconut palms	213	88.91	5600 nuts/ha	4200 nuts/ha	33.34	128800.00	107000.00	96000.00	74000.00
	Seasamum variety Kayamkulam-1	220	28.25	4.20	1.80	133.00	105000.00	74000.00	45000.00	30000.00
	Ragi variety Payyur -2	95	10.80	5.70	NA	100.00	34600.00	29000.00	NA	NA
ICAR-IIHR, Bengaluru	Ragi variety ML-365	160	64.00	35.00	20.00	42.80	115500.00	84000.00	62000.00	46000.00
	Pigeonpea variety BRG-5	105	32.00	6.25	3.00	52.00	59375.00	40650.00	27600.00	18000.00
	Field bean variety HA- 4	40	8.00	7.50	2.50	66.70	43500.00	30700.00	13250.00	7500.00
ICAR-NIANP, Bengaluru	Ragi variety ML-365	78	82.00	1.25	0.90	38.90	38430.00	16530.00	33900.00	12000.00
	Pigeonpea variety BRG-5	78	82.00	84.00	72.00	16.70	128817.00	109983.00	-	-
Total		989	395.96							



Finger millet variety ML-365 (IIHR Bengaluru)



INM in coconut (CAR-CPCRI RS, Kayamkulam)

(c) Horticulture module

Technology wise interventions implemented under horticulture module by FFP institutes are presented in Table 131. A total of 392 farmers were involved in demonstrations of improved technologies in 45.19 ha spread over in different cluster of villages. Demonstration on Gajendra variety of Amorphophallus as intercrop by ICAR-CPCRI RS gave yield of 28.20 q/ha with net return of Rs. 99000.00 as compared to 19.17 q/ha with net return of Rs. 58800.00 under check.

Demonstration on tomato (Arka Rakshak) with precision farming package by ICAR-IIHR gave yield of 115.00 q/ha with net return of Rs. 743500.00 as compared to 63.75 q/ha with net return of Rs. 352800.00 under check. Demonstration on okra (Arka Anamika) by ICAR-NIANP gave yield of 14.00 q/ha with net return of Rs. 414400.00 as compared to 11.00 q/ha under check with net return of Rs. 90000.00.

Table 131: Technology wise interventions implemented under horticulture module by FFP institutes

Institute	Intervention / technology	Farmer (No.)	Area (ha)	Measurable indicators yield (q/ha)			Economics of demo (₹/ha)			Economics of check (₹/ha)
				Demo (q/ha)	Local (q/ha)	Increase (%)	Gross return	Net return	Gross return	Net return
ICAR-CPCRI RS, Kayamkulam (ICAR-CRCRI, Kasaragod)	Banana cultivation for proper space utilization around fish ponds	61	4.80	67.50	46.00	46.74	23600.00	141600.00	161000.00	69000.00
	Sreekeerthi variety of dioscorea as intercrop	18	2.50	14.10	8.70	51.85	13600.00	82000.00	38800.00	18400.00
	Gajendra variety of Amorphophallus as intercrop	90	3.24	28.20	19.17	44.60	11280.00	99000.00	76700.00	58800.00
	Mahima variety of ginger as intercrop	19	0.92	24.24	15.60	55.38	12120.00	82420.00	78000.00	53000.00
	Pragathi variety of turmeric as intercrop	70	4.28	41.40	25.98	59.35	16560.00	94200.00	103900.00	65100.00
ICAR-IIHR, Bengaluru	Tomato (Arka Rakshak) with precision farming package	12	3.20	115.00	63.75	45.00	13800.00	743500.00	756009.00	352800.00

Capsicum with precision farming package	3	0.60	30.00	18.75	37.50	750000.00	420500.00	480018.00	251500.00
French bean (Arka Arjun),	10	2.40	15.75	8.00	49.20	270013.00	154700.00	144000.00	82450.00
Tuberose (Arka Prajwal)	8	1.80	15.00	NA	NA	1125000.00	695000.00	NA	NA
Mango	67	13.40	87.50	55.00	37.00	348000.00	215660.00	192000.00	98400.00
Tomato (ArkaRakshak)	2	0.40	28.00	19.00	47.40	448000.00	445000.00	112000.00	82000.00
Beans (Arka Arjun)	5	0.56	32.50	26.00	25.00	1300000.00	1297000.00	260000.00	230000.00
Ridge gourd (Arka Prasanna)	7	2.37	66.00	61.00	8.00	1392300.00	1388300.00	147000.00	107000.00
Okra (Arka Anamika)	4	0.87	14.00	11.00	27.30	417600.00	414400.00	120000.00	90000.00
Spinach/palak (Arka Anupama)	4	0.50	1400 bunches /ha	1100 bunches /ha	27.30	120000.00	118000.00	60000.00	40000.00
Chilly (ArkaKyathi)	3	1.00	22.00	18.00	22.00	660000.00	656500.00	165000.00	130000.00
Bottle gourd (ArkaBahar)	1	0.25	20.00	16.00	25.00	240000.00	235000.00	240000.00	190000.00
Drumstick (PKM1)	1	0.50	6.00	3.00	100.00				
Total	392	45.19							



Arka Prajwal tuberose (IIHR Bengaluru)



Arka Rakshak tomato (IIHR Bengaluru)

(d) Livestock module

Technology wise interventions implemented under livestock module by FFP institutes are presented in Table 132. A total of 1933 farmers were involved in demonstrations of improved technologies in different cluster of villages. Demonstration on poultry (Gramapriya, Gramasree and BV-380) by ICAR-

CPCRI RS gave yield of 1553 eggs/day/unit as compared to 760 eggs/day/unit under check. Demonstration on Demonstration on area specific mineral mixture by ICAR-NIANP gave milk yield of 10.25 l/day/animal as compared to 10.00 l/day/animal under check.

Table 132: Technology wise interventions implemented under livestock and poultry module by FFP institutes

Institute	Intervention / technology	Farmers (No.)	Unit/No./ Area	Output		Increase of output
				Demo	Local	
CPCRI RS, Kayamkulam (ICAR-CRCRI, Kasaragod)	Fodder cultivation (Co-5, Co-3, fodder maize)	105	10.00 ha	3600.00 q/ha	2000.00 q/ha	80.00%
	Poultry (Gramapriya, Gramasree and BV-380)	64	64 Units	1553 eggs /day	760 eggs/day	104.34%
ICAR-IIHR, Bengaluru	Dairy-fodder maize, sorghum, balanced feeding with mineral mixture and animal health camp	33	140 animals	Reduced the mastitis, improved the quality of milk like fat content increased from 2.00-2.50 to 3.50-5.00 and SNF increased up to 8.50	Quality of milk is reduced due to mastitis disease and in milk, fat content and SNF content is low	41.70% of milk yield increased, repeat breeding reduced by 90.00% and mastitis disorder reduced
	Small ruminants-low protein and concentrate supplement, mineral deficiency and reproductive problem and small ruminant rearing awareness program	40	133 animals	Increase in weight of animals from 14.00-16.00 kg to 18.00-20.00 kg and improvement in reproductive performance of animals	Reproductive performance is low and vaccination could not be done regularly	90.00 % of the repeat breeding reduced and awareness created about feeding & management practices
	Fisheries-enhanced polyculture practices	5	1500 fish fingerlings	In 1acre tank area, gives 2100.00-2250.00 kg of yield	Practicing monoculture (single variety farming)	45.00% of the yield weight of fish increased
ICAR-NIANP, Bengaluru	Animal health and fertility management	59	79 animals	1 insemination to conceive	3 insemination to conceive	200.00%
	Mineral nutrition	353	378 animals	10.25 l milk yield per animal	10.00 l milk yield per animal	2.50% yield increase

Lameness management	50	100 animals	Rs. 300.00 veterinary expenses per month per animal	Rs. 800.00 veterinary expenses per month per animal	62.50% reduction in veterinary expenses
Mastitis management	500	589 animals	Rs. 250.00 veterinary expenses per month per animal	Rs. 1500.00 veterinary expenses per month per animal	83.00% reduction in veterinary expenses
HACCP based quality milk production	500	589 animals	340.00 l milk yield per animal	300.00 l milk yield per animal	13.00% increase in milk yield
fodder production and conservation	224	318 animals/ 261 acres	322.5 l milk yield per animal	300.00 l milk yield per animal	5.50 % increase in milk yield
Total	1933				



Collecting milk samples to know the occurrence of spores of mastitis disease (ICAR-NIANP, Bengaluru)



Animal health checkup (ICAR-NIANP, Bengaluru)

(e) Enterprise module

Technology wise interventions implemented under enterprise module by FFP institutes are presented in Table 133. A total of 127 farmers were involved in demonstrations of improved technologies in 88.10 ha spread over in different cluster of villages.

Demonstration on turmeric powder enterprise by ICAR-CPCRI RS gave annual income of Rs. 60000.00/farmer. Demonstration on button mushroom production enterprise by ICAR-NIANP gave annual income of ₹25200.00/farmer.

Table 133: Technology wise interventions implemented under enterprise module by FFP institutes

Institute	Enterprise	Intervention / technology	Area (ha)	Farmers (No.)	Income/farmer due to this intervention (Rs.)	Annual income/ farmer before intervention (Rs.)	Annual income/ farmer after intervention (Rs.)
CPCRI RS, Kayamkulam (ICAR-CRCRI, Kasaragod) CPCRI Kasaragod	Turmeric powder enterprise	Supply of adequate machineries to women groups, training programs, convergence with farmers	12.00	5	5000.00/ month	New enterprise started in FFP	60000.00
	Value added products of coconut	Supply of machineries for individual units, training programs, convergence with farmers	27.00	3	54000.00/month	New enterprise started in FFP	648000.00
	Kera Probio (Bacillus megatherium) Production unit	Lab facilities and multiplication infrastructure, culture of bio agent and trainings	48.00	7	700.00/month	New enterprise started in FFP	84000.00
ICAR-IIHR, Bengaluru	Vegetable seedling production	Nursery for vegetable seedling production	0.10	1	Started work from January, 2020	Data is yet to be collected	-
	Mushroom production	Cultivation of mushroom	0.10	8	Started work from December, 2020	- Do -	-
ICAR-NIANP, Bengaluru	Mushroom production	Button mushroom production	0	49	2100.00/month	-	25200.00
	Milking machine as doorstep service	Youths identified and provided with milking machine for door step milking services	0	54	7000.00/ month	-	84000.00
Total			88.10	127			



Kera probio, ICAR-CPCRI RS (Kayamkulam)



Pathiyoor eggs, ICAR-CPCRI RS (Kayamkulam)

(f) Integrated Farming Systems (IFS) module

Technology wise interventions implemented under IFS module by FFP institutes are presented in Table 134. A total of 333 farmers were involved in demonstrations of improved technologies on 54.70 ha spread over in different cluster of villages. Demonstration on fish fingerlings (Koi Anabas and

Nile Tilapia) in coconut based IFS by ICAR-CPCRI RS gave annual income of Rs. 133800.00/farmer. Demonstration on field crops + chilli + mango + dairy farming + small ruminants by ICAR-IIHR gave annual income of Rs. 163414.00/farmer.

Table 134: Technology wise interventions under Integrated Farming Systems (IFS) module

Institute	Intervention / technology	Area (ha)	Farmers (No.)	Income/farmer due to this intervention (Rs.)	Annual income/farmer before intervention (Rs.)	Annual income/farmer after intervention (Rs.)
CPCRI RS, Kayamkulam (ICAR-CPCRI, Kasaragod) CPCRI Kasaragod	Integration of poultry birds for the income improvement	0	65	18895.50	77555.00	99450.00
	Introduction of fingerlings (Koi Anabas and Nile Tilapia) in coconut based IFS	1.40	62	36421.86	65710.00	133800.00
	Integrating intercrops in coconut gardens	50.00	180	32740.80	74700.00	110048.00

ICAR-IIHR, Bengaluru	Field Crops + French bean + Mango + Dairy Farming + Small Ruminants	0.80	7	134814.50	80398.00	134814.50
	Field Crops + Chilli + Mango + Dairy Farming + Small Ruminants	1.00	4	163414.00	92835.00	163414.00
	Field Crops + Tomato + Mango + Dairy Farming + Small Ruminants	1.50	5	213102.00	121898.00	213102.00
ICAR- NIANP, Bengaluru	Climate resilient farming	0	10	11000.00	80000.00	132000.00
Total		54.70	333			



Fodder maize as inter crop in coconut garden
(IIHR Bengaluru)



Coconut + poultry, ICAR-CPCRI RS, Kaymkulam
(ICAR-CPCRI, Kasaragod)

(g) Capacity building programmes

Thematic area and institute wise capacity building programmes organized under FFP are presented in Table 135. Farmers empowerment was done through organization of 155 capacity building programmes

under different thematic areas related to agriculture and allied sector enterprises like crop production, livestock production, natural resource management, etc. by involving 2187 farmers.

Table 135: Thematic area and institute wise capacity building programmes organized under FFP

Thematic area	ICAR-CPCRI RS, Kayamkulam		ICAR-IIHR, Bengaluru		ICAR-NIANP, Bengaluru		Total	
	Programmes (No.)	Farmers (No.)	Programmes (No.)	Farmers (No.)	Programmes (No.)	Farmers (No.)	Programmes (No.)	Farmers (No.)
Capacity building and group dynamics	5	152	22	43	5	94	32	289
Crop production	7	225	8	51	7	232	22	508
Entrepreneurship development	1	26	4	13	1	16	6	55
Farm implements	2	21	2	23	0	0	4	44
Livestock production and management	1	5	8	37	7	128	16	170
Natural resource management	2	117	8	105	3	61	13	283
Nutrition security	2	64	2	43	1	55	5	162
Plant protection	3	48	15	42	1	24	19	114
Processing and value addition	2	16	4	22	0	0	6	38
Production of inputs at site	1	23	0	0	3	25	4	48
Soil health and fertility management	5	89	3	37	3	51	11	177
Women empowerment	7	121	4	45	6	133	17	299
Total	38	907	80	461	37	819	155	2187

(h) Extension activities

To create more awareness among farmers in agriculture and allied sectors, different extension activities were organized by the institutes which are presented in Table

136. In total, 4197 farmers were participated in 374 different extension programmes organized by FFP institutes.

Table 136: Extension activities organized by FFP institutes

Extension activity	ICAR-CPCRI RS, Kayamkulam		ICAR-IIHR, Bengaluru		ICAR-NIANP, Bengaluru		Total	
	Programmes (No.)	Farmers (No.)	Programmes (No.)	Farmers (No.)	Programmes (No.)	Farmers (No.)	Programmes (No.)	Farmers (No.)
Advisory services	38	209	35	117	41	282	114	608
Celebration of important days	2	84	1	28	3	187	6	299
Diagnostic visits	48	153	15	80	20	101	83	334
Exhibitions	0	0	1	35	1	40	2	75
Exposure visits	0	0	5	55	0	0	5	55
Ex-trainees sammelans	19	198	5	40	1	63	25	301

Farm science clubs	2	75	0	0	2	47	4	122
Farmers' seminar/workshops	1	108	4	37	2	94	7	239
Field days	6	128	1	95	4	135	11	358
Film shows	0	0	5	45	0	0	5	45
Group discussions	19	168	20	55	11	148	50	371
Kisan ghosthies	1	55	0	0	1	30	2	85
Kisan mela	1	263	1	60	1	117	3	440
Method demonstrations	24	205	3	22	12	275	39	502
Plant/animal health camps	0	0	5	29	12	243	17	272
Farm quiz programmes	1	91	0	0	0	0	1	91
Total	162	1737	101	698	111	1762	374	4197

3.4 Agriculture Technology Information Centre (ATIC)

Agriculture Technology Information Centers (ATICs) are serving as a single window delivery system in the country by providing technology information, advisory services and technological inputs to farmers. During the reporting period, 148044 farmers visited ATICs for obtaining solutions related to their agricultural problems. ATICs provided information related to various aspects of farming to 60321 farmers, both through print and electronic media. Technology Products provided to 87723 farmers. They received 5424 q seeds of various crops, 222766 planting materials, 15665 poultry birds and 486 quintals bio-products through ATICs. Prominent technological services provided to farmers by the ATICs were agri-veterinary services (11978), soil and water testing (3250), kisan call center (45775), kisan mobile advisory (1364) and animal diagnostic visits (8734).

3.5 Technological Backstopping by Directorate of Extension

KVKs serve as a bridge between the source of technology and their stakeholders. In this process, Directorates of Extension (DEs) under various state agricultural universities play an important role by providing technological backstopping to KVKs under their jurisdiction. Directors of Extension also play a

major role in coordinating and monitoring of KVK activities. During the year, Directorates of Extension conducted 124 workshops/meetings. DEs supported KVKs in organizing world soil day, world water day, pulse day, besides hold in monthly and quarterly review meetings and pre-action plan meetings.

Directors of Extension and their officials participated in 34 scientific advisory committee meetings, 126 field days, 125 workshops/seminars, 30 technology weeks and 157 training programmes. In addition, they have attended 1033 other programs including interface meetings, group discussion with KVK officials, annual review meeting, farmers meet, animal health camp and krishimela (Table 137). Directors of Extension and their officials visited 52 on farm trials and 133 plots of frontline demonstrations to review and monitor the technology dissemination process at KVKs in the respective operational areas. DEs also undertook the technological backstopping by delivering 485 lectures, 19 TV talks, 27 radio talks and 561 news items in newspapers.

Table 137: Details of participation in different activities by Directorates of Extension

Activities	Numbers
Scientific Advisory Committee meetings	34
Field days	126
Workshops/seminars	125
Technology week	30
Training programmes	157
Other programmes	1033
Total	1505

RESEARCH PROJECTS

Project wise major achievements are presented below.

4.1 Institute Research Projects

4.1.1. 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: 24 months, April 2018 – March 2020

Major Achievements:

Data collection process was completed from 815 trainees, both for before and after the long-duration training. The data was compiled, computerized and subjected analysis. Aspirations of the skill training participants were assessed on the first and last day of the programme using a questionnaire consisting of five areas of occupational aspiration and six areas of social aspirations.

State-wise differences (Table 138):

Most prominent aspirations of the skill trainees was to 'start a new occupation', in both Karnataka and Kerala. Overall, 'expanding present profession' was the second most important occupational aspiration, and it was true for Karnataka whereas getting a 'job in government/recognized institution' was the second ranked occupational aspiration in Kerala. Among the social aspirations, 'providing better food, clothes and health facilities to family' was the most important social aspiration. It was overwhelming in Kerala (93.5%) whereas in Karnataka the most important social aspiration was to become 'model to others in the profession' after undergoing skill training.

Table 138 : Differences in the aspirations of the participants in Karnataka and Kerala

Aspirations	Karnataka			Kerala			Total		
	Number	%	Rank	Number	%	Rank	Number	%	Rank
Occupational Aspirations									
Starting new profession	390	72.49	I	246	88.81	I	636	78.04	I
Expanding present profession	377	70.07	II	200	72.20	IV	577	70.80	II
More salary in present job	368	68.40	III	198	71.48	V	566	69.45	III
Get job in government / recognized institutions	268	49.81	V	218	78.70	II	486	59.63	IV
Find a job in the local area	269	50.00	IV	214	77.26	III	483	59.26	V
Social Aspirations									
Provide better food, clothes and health facilities to family	482	89.59	II	259	93.5	I	741	90.92	I
Become model to others in the profession	487	90.52	I	230	83.03	III	717	87.98	II
Improved status in family, friends, relatives	447	83.09	III	230	83.03	III	677	83.07	III
Improved status in the village and community	445	82.71	IV	230	83.03	III	675	82.82	IV
Acquire new property and vehicles	402	74.72	VI	225	81.23	V	627	76.93	V
Improved status in the Work Place	421	78.25	V	198	71.48	VI	619	75.95	VI

Change in aspirations due to training:

The skill training enhanced the occupational aspirations of the participants as evident from the number of respondents expressing a particular aspiration at the start and at the end of the training (Table 139).

Change in occupational aspirations:

After participation in the training, more participants expressed aspiration to 'get job in government or recognized institute' (increased from 487 respondents at the start of the training to 539 respondents on the last day), followed by the aspiration to earn 'more salary in the present job' (increased from 597 participants to 647 after the training). Getting a job in government/recognized institution was the least expressed aspiration with only 487 of the 815 participants having any hope. But the training

enhanced the confidence of 6.38% of the participants to get a job in government/recognized institution.

Change in social aspirations:

The social aspirations were generally high with minimum of 671 participants and maximum of 759 respondents expressing social aspirations, during either pre or post training. The aspiration to 'become a model to others in the profession' was high both at the start and increased further at the end of training. Providing an 'improved lifestyle in the form of better food, clothes and health facilities' to their family members, was also found to be the most expressed aspiration both at the start as well as at the end. However, there was a decline in the aspiration to acquire property and vehicles, may be due to the realization that mere skill training may not directly lead to immediate prosperity.

Table 139: Status of the occupational and social aspirations of skill training participants at the start and end of the programme

Aspirations	Respondents (No.)			Rank
	pre	post	Difference	
Occupational Aspirations				
Get job in government / recognized institutions	487	539	52	I
More salary in present job	597	637	40	II
Expanding present profession	614	647	33	III
Starting new profession	655	660	5	IV
Find a job in the local area	540	541	1	V
Social Aspirations				
Become model to others in the profession	739	759	20	I
Provide better food, clothes and health facilities to family	736	751	15	II
Improved status in the village and community	704	716	12	II
Improved status in family, friends, relatives	706	715	9	IV
Improved status in the Work Place	682	691	9	V
Acquire new property and vehicles	692	671	-21	VI

Profile of the participants and the relationship and contribution on the aspiration levels:

Profile characteristics of skill aspirants in Karnataka and Kerala revealed many similarities. The average age of the aspirants was 34.16 years in Karnataka and 36.12 years in Kerala. Average education was up to higher secondary level, but majority of them are either school dropout (31.53%) or graduates (29.68%) in

Karnataka, whereas, in Kerala school dropout were the largest group (36.82%) followed by higher secondary (27.79%) and graduates (24.90%). About seven per cent in both the states have professional degrees. Majority of the aspirants (60.61%) in both the States are married and they continued to stay in joint families, and

the average family size was little more than 5 in Karnataka and little less than 5 in Kerala. However, the two states differed significantly on the gender composition of the participants, average income and land holding status. Female participants were less in Karnataka as male participants constituted nearly 90%, whereas in Kerala, female participants constituted about 45%. Annual income was little higher in Karnataka with Rs.71959 as compared to Rs.65267 in Kerala. The average landholding of the participants is far less in Kerala (0.74 ha) compared to Karnataka (4.77 ha). Most of the respondents were the practicing agriculturists in Karnataka (70.63%), whereas only 28.88 % are the practicing agriculturists in Kerala. Occupation of the spouses of the respondents indicated that nearly half of them (47.77 % in Karnataka and 49.81% in Kerala) were unemployed, with only 1.30 % in Karnataka and 10.46% in Kerala being employed.

Influence of personal and social profile of the participants on their aspirations is presented in Table

140. Age of the participants and occupation of the spouse had negative and significant influence on both occupational and social aspirations. The results indicated that youth have higher aspiration and the aspirations decline as age advances. Similarly, better the occupation of spouse, lesser was the aspirational level. The secured occupation of one spouse in the family reduces the aspirations of the other spouse. That means, when both the spouses are not gainfully employed, it induces higher aspirations. Marriage status of the participants had positive and significant influence on aspirations. Married men and women exhibited higher occupational as well as social aspirations than unmarried participants. Marriage brings more urgency among the individuals to earn for their livelihood and hence induces for higher aspirations. Gender has positive influence on occupation but negative influence on social aspirations. Women participants had negative correlation with social aspirations.

Table 140: Influence of independent variables on occupational and social aspirations of the skill training participants

Independent variables	Occupational Aspirations				Social Aspirations			
	Reg. Coeff. B	Std error	t value	Sig	Reg. Coeff B	Std error	t value	Sig
Age	-0.043	0.016	-2.763	0.006	-0.060	0.016	-3.721	0.000
Education	0.024	0.048	0.492	0.623	-0.011	0.050	-0.224	0.823
Gender	-0.018	0.327	-0.055	0.956	-0.919	0.337	-2.724	0.007
Occupation	0.109	0.110	0.995	0.320	0.192	0.113	1.693	0.091
Married status	1.388	0.513	2.708	0.007	1.107	0.529	2.094	0.037
Male children	-0.135	0.218	-0.618	0.537	0.176	0.225	0.781	0.435
Female children	-0.128	0.212	-0.604	0.546	0.014	0.219	0.063	0.949
Spouse occupation	-0.288	0.134	-2.153	0.032	-0.244	0.138	-1.771	0.077
Family type	0.237	0.332	0.714	0.475	-0.161	0.343	-0.470	0.639
Family income	E	0.000	-0.714	0.476	E	0.000	-0.266	0.790
Land holding	-0.018	0.023	-0.768	0.443	-0.005	0.024	-0.214	0.831
Vehicles possession	-0.088	0.061	-1.445	0.149	0.109	0.063	1.740	0.082

4.1.2 Title: An Analysis of Management of Dairy Animals and their Contribution in the Livelihood Security of Farm Families

Principal Investigator : Dr. D.V. Kolekar
Co-Principal Investigator : Dr. Thimmappa K
Project duration : Three-years
 (July, 2018 - June, 2021)

Major achievements:

Based on available review of literature and information from various reports and websites, problem has been identified and overview of research work has been prepared for research project entitled - An analysis of management of dairy animals and their contribution in the livelihood security of farm families. Interview schedule has been prepared by keeping in view various objectives, variables of the study and other important aspects such as statistical analysis. Data collection and its entry in excel is under progress.

4.1.3 Title: Study on Agri Based Entrepreneurship Development among Youth

Principal Investigator : Dr. Thimmappa K
Co-Principal Investigator : Dr. B.T.Rayudu and
 Dr.D.V.Kolekar
Project duration : Jan 2019 to Dec 2023

Major achievements:

Project on - Agri based entrepreneurship development among youth is being under taken to study the aspirations of youth, perception of youth towards farming and agro-enterprises, analyze performance of agro-enterprises established by youth and identify constraints faced by youth in the management of agro-enterprises. Literature reviews were collected on aspirations of youth, perception of youth towards farming, perception of youth towards agro-enterprises, performance of agro-enterprises and constraints faced by the youth. Interview schedule has been prepared by keeping in view the objectives and variables of study.

4.2 Externally funded research projects

4.2.1 Network Project on New Extension Methodologies and Approaches (NEMA)

Co-Principal Investigator : Dr. D.V. Kolekar
Project duration : One-year, two month
 (Feb, 2019 - Mar, 2020)

Major achievements:

New agricultural technologies are considered to be the prime mover of agricultural development of India. There are a number of improved technologies like zero tillage and direct seeded rice adopted by the farmers. Network project is conceived to generate data on adoption of selected improved technologies, the determinants of adoption, constraints and impact assessment and drawing meaningful conclusion. This project is funded by Division of Agricultural Extension, ICAR, New Delhi involving cost of Rs. 118.97 lakh and being implemented through 19 ICAR research institutes on network mode. Under this project study on Impact analysis of banana special technology has been taken during February, 2019 - March, 2020. Based on available review of literature and information from various reports and websites, problem has been identified and overview of research work has been prepared. Interview schedule has been prepared by keeping in view various objectives, variables of the study and other important aspects such as statistical analysis, pretested with non-respondent sampling population. Excel sheet has been prepared with specific codes. Collection of data and its entry in excel sheet is under progress.

PUBLICATIONS

5.1 Research Articles

Chandre Gowda M.J., Randhir Singh, Sreenath Dixit and Srivinasa Reddy, 2019. Resources, demography and motives driving organic farming. *Indian Journal of Agricultural Sciences*, 89 (11):1753-1988.

Chandre Gowda M.J., N.Nagaraja, D.V.Srivinasa Reddy and M.B.Hanji, 2019. Effectiveness of peripatetic training on land resource inventory in Kalaburagi and Bidar districts of Karnataka. *The Mysore Journal of Agricultural Sciences*, 53 (2):63-72.

Mahantesh Shirur, N.S. Shivalingegowda, M.J. Chandregowda, V.Manjunath and Rajesh K. Rana, 2019. Critical dimensions of entrepreneurship and entrepreneurial behaviour among mushroom growers: principal component analysis. *Indian Journal of Agricultural Research*, DOI: 10.18805/IJARE.A-5261.

5.2 Papers Presented in International/National Conferences

M.J.Chandre Gowda and S.S.Dolli, 2019. Application of participatory rural appraisal along with geographical positioning system for benchmark assessment 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, 131.

Mallikarjun 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, pp.143. 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, 74.

Kolekar DV and Chandre Gowda M.J. 2019. Contribution of indigenous vs crossbred cattle in the livelihood of farm households in southern Karnataka. International conference on Extension for Strengthening Agricultural Research and Development, December 14-16, Mysuru, 72.

Kolekar DV and Chandre Gowda M.J. 2019. Contribution of indigenous vs crossbred cattle in the economic security of farmers of northern Karnataka. International conference on Extension for Strengthening Agricultural Research and Development, December 14-16, Mysuru, 73.

G.S. Naveen Kumar, MallikarjunHanji, 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, India on 26-28 Feb. 2019, pp.143. National Conference on “Advanced Research Methodologies in Social Sciences” (ARMSS-2019) held at University of Agricultural Sciences, Dharwad, Karnataka State, 5.

Jagadish K N, Harish B.S. and Chandre Gowda M.J. 2019. A new extension approach from KVK Tumakuru. International conference on Extension for Strengthening Agricultural Research and Development, December 14-16, Mysuru, 79.

Nagaraja N., Manjula N. and Chandre Gowda M.J. 2019. Solomon four group research design: an appropriate design for social science research. International conference on Extension for Strengthening Agricultural Research and Development, December 14-16, Mysuru, 138.

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.

Narjary, B., Jangra, P., Pathan, A.L., Raju, R., Thimmappa, K., Meena, R.L., Kumar, P., Chinchmalatpure, A.R., Kumar, S., Bundela, D.S. and Kamra, S.K. 2019. Performance evaluation of SSD project (Siwanamal, Jind) using electromagnetic induction techniques. In: Abstracts GJISC on Resilient Agriculture in Saline Environments under Changing Climate: Challenges and Opportunities, held at ICAR-CSSRI, Karnal, during 7-9 February, 2019, pp. 16.

Raju, R, Thimmappa, K. and Pathan, A.L. 2019. Economic impact analysis of saline soil reclamation through subsurface drainage in Karnataka. In: Abstracts GJISC on Resilient Agriculture in Saline Environments under Changing Climate: Challenges and Opportunities, held at ICAR-CSSRI, Karnal, during 7-9 February, 2019, pp. 224.

Rayudu B.T., 2019. Abstract entitled Probortunity: Beyond the technology options for anticipatory needs of the farmers through Krishi Vigyan Kendras published during the National conference on Advanced Research Methodologies in Social Sciences (ARMSS-2019) held at UAS, Dharwad during 26-28 February, 2019. Oral 1-27, P.18.

Sheoran, P., Basak, N., Yadav, R.K., Singh, R., Kumar, S., Singh, R.K., and Thimmappa, K. 2019. Quantifying yield response and management

strategies to continuous use of sodic irrigation in rice-wheat production system. In: Abstracts GJISC on Resilient Agriculture in Saline Environments under Changing Climate: Challenges and Opportunities, held at ICAR-CSSRI, Karnal during 7-9 February, 2019, pp. 82-83.

Singh, R., Sharma, D.K., Chaudhari, S.K., Joshi, P .K., Tripathi, R.S., Thimmappa, K., Kumar, S., Rai, A.K. and Singh, A. 2019. Impact of tillage and crop residue management on water productivity, natural resource saving, and soil health under ricewheat cropping sequence in reclaimed sodic soil environment. In: Abstracts GJISC on Resilient Agriculture in Saline Environments under Changing Climate: Challenges and Opportunities, held at ICAR-CSSRI, Karnal, during 7-9 February, 2019, pp. 55.

Thimmappa, K., Raju, R. and Singh, Y. 2019. Reducing farm income losses through sodic land reclamation in Indo-Gangetic plains, In: Abstract Agricultural Science Congress, Innovations for Agricultural Transformation. held at New Delhi, during 20-23 Feb.2019. pp. 397.

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 / Book Chapters

Chandre Gowda M. J. and Sushmita C.V., 2019. Role of KVKs in the capacity building of farmers on land resources inventory under Sujala III. ICAR ATARI Bengaluru, 220.

Chandre Gowda M. J., Srinivasa Reddy DV, Randhir Singh, Mallikarjun B Hanji, Mouneshwari Kammar, Loganandhan N, Bharati Hegde, 2019. Reimagining agriculture: farmers innovations. ICAR ATARI Bengaluru, 75.

Sreenivasa Reddy D.V., M.J.Chandre Gowda, Prasad JVNS, Ravindra Chary G and Vidya C. 2019. Climate smart technologies for climatic aberrations. ICAR ATARI Bengaluru, 120.

Singh AK, Randhir Singh, Adhiguru P, Chandre Gowda MJ, Thimmappa K and Hanji MB. 2019. Attracting and retaining youth in agriculture. ICAR Agricultural Extension Division, 75.

5.4 Extension Literature

Chandre Gowda M.J., 2019. Role of KVKs in the capacity building of farmers under Sujala III (English), Extension folder, ICAR- ATARI, Bengaluru.

Chandre Gowda M.J., 2019. Role of KVKs in the capacity building of farmers under Sujala III (Kannada), Extension folder, ICAR-ATARI, Bengaluru.

5.5 Report

Annual Report 2018-19, ICAR Agricultural Technology Application Research Institute (ATARI), (Eds: M.J.Chandre Gowda and D.V.Srinivasa Reddy), ICAR Agricultural Technology Application and Research Institute, Zone XI, Bengaluru, India, pp.124p.

5.6 Publications by KVKs

KVK staff of Karnataka published 100 research papers, 146 technical reports, 44 technical bulletins, 291 popular articles and 236 extension literature, and Kerala published 24 research papers, 29 technical reports, 6 technical bulletins, 88 popular articles and 67 extension literature on various technological aspects of agriculture and its allied enterprise.

HUMAN RESOURCES DEVELOPMENT

Management development programme (Phase III) for newly recruited heads of KVKs (Senior scientist level position) was organized by ICAR-ATARI, Bengaluru during 04 January to 08 January, 2019. Eight newly recruited heads of KVKs from Zone-XI have participated in the programme. 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. 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

Orientation training programme for newly recruited scientists of KVKs under ICAR-ATARI, Zone-XI was organized at KVK, Mysuru during 16-20 September, 2019. In this programme, 33 subject matter specialists from Karnataka and Kerala participated. Similarly, another orientation training programme for newly recruited scientists of KVKs under ICAR-ATARI, Zone-XI was organized at KVK, Kasaragod during 23-27 September, 2019. In this programme, 30 subject matter specialists from Karnataka and Kerala were participated. Officials of ICAR-ATARI, Zone-XI and eminent scientists were invited as resource persons for these programmes. An overview of KVK system in India, participatory rural appraisal, technology assessment and frontline demonstrations, capacity building of farmers, rural youth, women and extension functionaries, working with farmers organizations and technology providers, biodiversity protection, preparing research and development projects, knowledge sharing in digital era, organizing mandated activities, administrative and financial matters were covered during the training programmes.

Training programmes on public financial management system (PFMS) for the of KVK and agricultural university staffs were organised in collaboration with UAS Raichur, UAS Dharwad and UAHS Shivamogga. A total of 3 PFMS training programmes were organized in which 113 KVKs and universities staffs were participated. Primary

objective was to establish an efficient fund flow system and expenditure network. 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 were covered during the training programmes.



Orientation Training for Newly Recruited KVK Scientists at Mysore



Orientation Training for Newly Recruited KVK Scientists at Kasaragod

WORKSHOPS/MEETING/ CONFERENCES

Director/officials of the institute conducted/participated in the following meetings/workshops/conferences/seminars/training programmes held during the period under report:

Dr.M.J. Chandre Gowda, Principal Scientist (Agricultural Extension) and Director (Acting)

Participated in Directors Conference on 31 January and 1 February, 2019 at NASC, New Delhi.

Chaired Session on Crop Diversifications - Focused Smart Agri-Value Chains – Potato, Tomato and Onion, Nutraceuticals, Aromatic and Medicinal Plant Products, in the R and D-Industry Panel Discussion at ICAR-NIANP, 09 February, 2019.

Participated as an Invited Speaker in International Conference on Agricultural Extension and Advisory Services: Innovation to impact, organized by MANAGE and Michigan State University, Hyderabad, 12-14 February 2019.

Chaired technical session on Biodiversity Act 2001 and other policy related issues related to biodiversity in the National Conference on Biodiversity and Plant Genetic Resource Conservation for Future held at UAHS, Shivamogga during 15-16 March, 2019.

Conducted action plan meeting of Kerala and Lakshadweep KVKs at KAU, Thrissur during 18-19 March, 2018.

Participated in the meeting with Agriculture Production Commissioner, Govt. of Kerala on 2 April, 2019.

Participated in annual action plan meeting of KVKs in tribal areas/districts for incurring expenditure of TSP funds of ICAR for KSHMATA activities on 22 April, 2019 at New Delhi.

Conducted state level action plan meeting of KVKs of Karnataka at UAS, Dharwad during 25 – 27 April, 2019.

Conducted annual review workshop of KVKs of Zone-XI from 14-16 May, 2019.

Participated in zonal review workshop of KVKs of Zone-X and workshop on NEMA at Hyderabad during 24 – 25 May, 2019.

Participated in ICAR award ceremony and farm innovators deliberation during 16 – 17 July, 2019.

Participated in brainstorming session on upscaling backyard poultry organised at Directorate of Poultry Research, Hyderabad on 8 August, 2019.

Participated in international training programme on extension at Ludhiana on 3 September, 2019.

Participated in meeting of QRTs at Delhi on 4 September, 2019.

Participated in orientation programme for newly recruited scientists of KVKs of Karnataka and Kerala at KVK Mysuru on 16 Sept 2019

Participated in orientation programme for newly recruited scientists of KVKs of Karnataka and Kerala at KVK, Kasaragod during 23 – 24 September, 2019.

Participated in first QRT Meeting of Zone-X and XI at ICAR-ATARI, Hyderabad on 26 September, 2019.

Participated in meeting of EFC on 1 October, 2019 at Krishi Anusandhan Bhawan, New Delhi

Participated in national conclave 2019 on sustainable CSR project in rural area at Mysore on 11 October, 2019.

Participated in QRT review of KVKs of UAS Raichur during 17-20 October, 2019.

Participated in NITI lecture by World Bank President Mr David R Malpas on a role of financial sector in development at vigyan bhawan, New Delhi on 26 October, 2019.

Participated in scientific advisory committee meetings of the following KVKs:

Conducted workshop for home scientists on nutri-gardens at KAU, Thrissur on 24 October, 2019.

As organizing secretary, coordinated and attended international conference on extension for strengthening agricultural research and development (eSARD), organized during 14-16 December, 2019 at KVK, Mysore.

- Pathanamthitta 17 January, 2019
- Ramanagara 6 February, 2019
- Tumakuru II – 11 February, 2019
- Tumakuru I – 6 March, 2019
- Kollam – 12 April, 2019
- Chikkaballapura – 30 April, 2019
- Chamarajanagara – 27 May, 2019
- Mandya – 28 May, 2019
- Davanagere – 23 December, 2019

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

Training workshop for vigilance officers of ICAR institutes at NAARM, Hyderabad during 31 October to 1 November, 2019.

Attended as a selection committee member for selection of SMS (Agro-met) and Agro-met Observer posts for KVK Gonikoppal on 8 April, 2019.

Organized and attended refresher programme for Sujala-III participants of State Department of Agriculture on 20 April, 2019.

Action plan workshop 2019-20 for KVKs of Karnataka state at UAS, Dharwad during 25-27 April, 2019.

Climate smart agriculture workshop for scaling up climate smart technologies, practices and services in Indian agriculture at NASC, New Delhi on 8 May, 2019.

Annual review workshop - 2019 for KVKs of ATARI, Zone-XI at UAHS, College of Horticulture, Mudigere, Karnataka during 14-16 May, 2019.

NICRA national level workshop on annual review cum action plan 2019-20 at CRIDA, Hyderabad during 4-7 June, 2019.

Visited Odisha state as technical expert with CRISAT team to survey the Fani cyclone affected areas in Puri and Khorda districts for preparation of Action Plan Rejuvenate Coconut Palms during 26-29 June, 2019.

Attended as a selection committee member for the selection of SMS (Agro-met) and Agro-met Observer posts for KVK Malappuram on 3 July, 2019.

Attended orientation training on upscaling of climate smart technologies organized by IWMI at NASC, New Delhi during 7-8 August, 2019.

Orientation training to DAMU staff at NRCP, Solapur on 19 August, 2019.

Review Meeting for KVKs of Kerala state at KAU, Thrissur on 27 August, 2019.

Stakeholders meet on upscaling of climate smart technologies in Haveri district under IWMI, Delhi at KVK, Haveri on 13 September, 2019.

Orientation training to newly recruited staff of KVKs of Karnataka and Kerala at KVK, Mysuru on 17 September, 2019.

Orientation training to newly recruited staff of KVKs of Karnataka and Kerala at KVK, Kasaragod during 25-27 September, 2019.

Attended as a selection committee member for selection of SMS (Agro-met) and Agro-met Observer posts for KVK Palakkad on 1 October, 2019.

Attended as a selection committee member for selection of SMS (Agro-met) and Agro-met Observer posts for KVK Kollam on 4 October, 2019.

Attended as a selection committee member for selection of SMS (Agro-met) and Agro-met Observer posts for 3 KVKs under UAS, Raichur at UAS, Raichur on 10 October, 2019.

Attended as a selection committee member for the selection of SMS (Agro-met) and Agro-met Observer posts for KVK Kolar on 15 October, 2019.

Served as a member in selection committee of best exhibition stalls in Krishi Mela 2019 of UAS, Bengaluru during 24-26 October, 2019.

NICRA annual review meeting at NASC, New Delhi during 17-18 December, 2019.

GKMS annual review meeting 219 of IMD at RVSKVV, Gwalior during 18-20 December, 2019.

Participated in scientific advisory committee meetings of the following KVKs:

- Hassan - 25 May, 2019
- Solapur I – 19 August, 2019
- Thiruvananthapuram – 10 December, 2019

**Dr.B.T.Rayudu, Principal Scientist
(Agricultural Extension)**

Action plan meeting of KVKs in Karnataka held at UAS, Dharwad during 25-27 April, 2019.

Annual review workshop of KVKs in Zone XI held at KVK, Chikkamagaluru during 14-16 May, 2019.

SAC Meeting of KVK, Belagavi-II held on 19 June, 2019.

Action plan cum review meeting of CFLD-KVKs of Karnataka held at ICAR-ATARI, Hebbal, Bengaluru on 22 July, 2019.

Meeting of QRTs Chairmen held at seminar hall, NASC, New Delhi on 4 September, 2019.

Orientation training for newly recruited staffs of KVKs at KVK Mysuru during 16-20 September, 2019.

QRT meeting in respect of ICAR-Agricultural Technology Application Research Institutes (ICAR-ATARIs) and Krishi Vigyan Kendra (KVKs) of Zone-X, Hyderabad and Zone –XI, Bengaluru held at ICAR-ATARI, Hyderabad during 26-27 September, 2019.

QRT meeting for the KVKs under the jurisdiction of UAS, Bengaluru held at GKVK Campus, UAS, Bengaluru during 03-04 October, 2019.

QRT meeting for the KVKs under the jurisdiction of UAS, Raichur held at KVK Kalaburagi-I during 18-19 October, 2019.

QRT meeting for the KVKs in Telangana at KVK, Gaddipally on 30 October, 2019 and at KVK, Wyra on 31 October, 2019.

QRT for KVKs under the jurisdiction of UAS, Dharwad and UAHS, Shivamogga held at UAS, Dharwad during 9 – 11 January, 2020

Meeting of research advisory committee (RAC) of 11 ATARIs held at New Delhi on 31 January, 2020.

QRT meeting for KVKs in Southern Andhra Pradesh held at RASS KVK, Chittoor during 3 – 6 February, 2020.

SAC meeting of KVK Gadag held on 7 March, 2020.

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

Organized and coordinated MDP for newly recruited PCs of KVKs as Coordinator at ICAR-ATARI, Zone-XI, Bengaluru during 4 - 8 January, 2019.

Organized and coordinated a team visit to Farmer FIRST Project villages in Ramanagara District on 17 February, 2019.

Organized annual review workshop 2018-19, KVKs of Karnataka, Kerala & Lakshadweep as Coordinator at ICAR-Krishi Vigyan Kendra, Chikkamagaluru during 14-16 May, 2019.

Organized five days Orientation Training for Newly Recruited Staffs of KVKs at KVK Mysuru during 16-20 September, 2019.

Organized five days orientation training for newly recruited staffs of KVKs at KVK Kasaragod during 23-27 September, 2019.

Organized and coordinated zonal committee meeting of Attracting and Retaining Youth in Agriculture (ARYA) project on 24 July, 2019.

Participated in scientific advisory committee meetings of the following KVKs;

- Chitradurga on 1 July, 2019.
- Shivamogga on 2 July, 2019.
- Chikkamagaluru 3 July, 2019.
- Udupi 4 July, 2019.

Participated in kisan mela of UAS Bengaluru on 25 October 2019.

Participated in annual review workshop 2018-19, KVKs of Karnataka, Kerala & Lakshadweep held at ICAR-Krishi Vigyan Kendra, Chikkamagaluru during 14-16 May, 2019.

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

Organized and coordinated inter zonal review cum action plan workshop of Farmer FIRST programme of Zone XI, Bengaluru & Zone VIII, Pune on 9 May, 2019.

Participated in national workshop on network project on New Extension Methodologies and Approaches (NEMA) organized by ICAR-ATARI, Hyderabad at NAARM, Hyderabad on 24 May, 2019.

Participated in NICRA national annual review workshop of KVKs at CRIDA Hyderabad and presented the broad outcomes, lessons learnt, scalable technologies and way forward of NICRA KVKs of Zone VIII, ATARI Pune during 4 to 6 June, 2019.

Organized and coordinated 3 days annual zonal workshop of KVKs of Zone VIII at ICAR-CCARI, Goa during 14 to 16 June, 2019.

Assisted in organizing foundation stone laying ceremony of administrative building of ATARI Pune and attended same on 3 August, 2019.

Attended regional committee meeting VII at NBSS&LUP Nagpur during 9-10 August, 2019.

Participated in national review workshop of KVKs falling under B, C & D categories under chairmanship of hon'ble union minister of state of ministry of agriculture and farmers welfare at NASC Complex, New Delhi held on 18 September, 2019. Made presentation about the strategy for improving the grading and efficiency of B, C & D Category KVKs from zone VIII, ATARI Pune and zone XI, ATARI Bangalore.

Participated in national review workshop on CFLD Oilseeds by KVKs under ICAR – ATARI at Training Hall, ICAR Conference Facilities, NASC Complex, New Delhi under the chairmanship of Joint Secretary (DAC) and in presence of ADG (AE), ICAR held on 30 September, 2019. Made presentation about progress of CFLDs on oilseeds of zone VIII, ATARI Pune.

Organized and Coordinated five days Orientation Training for Newly Recruited Staffs of KVKs at KVK, Mysuru during 16-20 September, 2019.

Organized and Coordinated five days Orientation Training for Newly Recruited Staffs of KVKs during 23-27 September, 2019 at KVK, Kasaragod.

Attended six days international training programme on impact assessment methodologies and techniques organised by ICAR-IARI with collaboration of IFPRI (International Food Policy Research Institute) at the Division of Agricultural Extension, IARI New Delhi during 14-19 October, 2019.

Organized and coordinated celebration of constitution day at ATARI Bengaluru on 26 November, 2019.

Organized and coordinated celebration of swachhta pakhwada on theme plastic se raksha – swachhata hi suraksha at KVKs of Zone-XI and ICAR-ATARI, Bengaluru during 16-31 December, 2019.

Dr.Mallikarjun B. Hanji, Chief Technical Officer (Computer)

Participated in National Conference on Advanced Research Methodologies in Social Sciences, organized by University of Agricultural Sciences, Dharwad, 26-28 February 2019.

Participated in Scientific Advisory Committee meeting of KVK Gadag on 8 March, 2019.

Attended as external examiner for qualifying examination of senior master degree students of the Department of Agricultural Statistics, UAS, Dharwad on 30 March, 2019.

Participated in ICAR award ceremony and farm innovators meet during 16 – 17 July, 2019 at NASC, New Delhi.

Participated in orientation programme for newly recruited scientists of KVKs of Karnataka and Kerala at KVK Mysuru on 19 Sept 2019

Participated in orientation programme for newly recruited scientists of KVKs of Karnataka and Kerala at KVK, Kasaragod on 26 September, 2019.

Participated in meeting of EFC on 1 October, 2019 at Krishi Anusandhan Bhawan, New Delhi

Attended 4th National Workshop on Research Data management during 10-11 December 2019, at NASC New Delhi.

PERSONNEL

8.1 Staff in Position

Staff working in ICAR-Agricultural Technology Application Research Institute (ATARI), Zone-XI, Bengaluru as on 31 December, 2019 is presented below.

Cadre	Name	Designation
Research Management Position	Dr. M.J. Chandre Gowda	Director (Acting) and Principal Scientist (Agricultural Extension)
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. J. Mathew	Assistant Administrative Officer
	Shri. Shaik Rukman	Assistant Finance & Accounts Officer
	Mrs. Ramola Pinto	Junior Stenographer
	Shri. N. Vinod Kumar	Lower Division Clerk
	Ms. K. Roopakala	Lower Division Clerk



ICAR-Agricultural Technology Application Research Institute
Zone XI, Hebbal, Bengaluru - 560 024