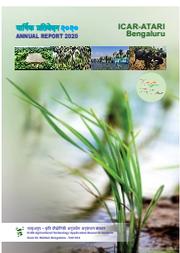


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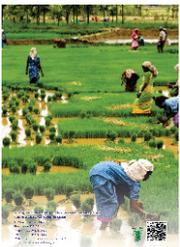
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ICAR-Agricultural Technology Application Research Institute  
Zone XI, Hebbal, Bengaluru - 560 024



Paddy Plant Clump (KVK, Kannur)

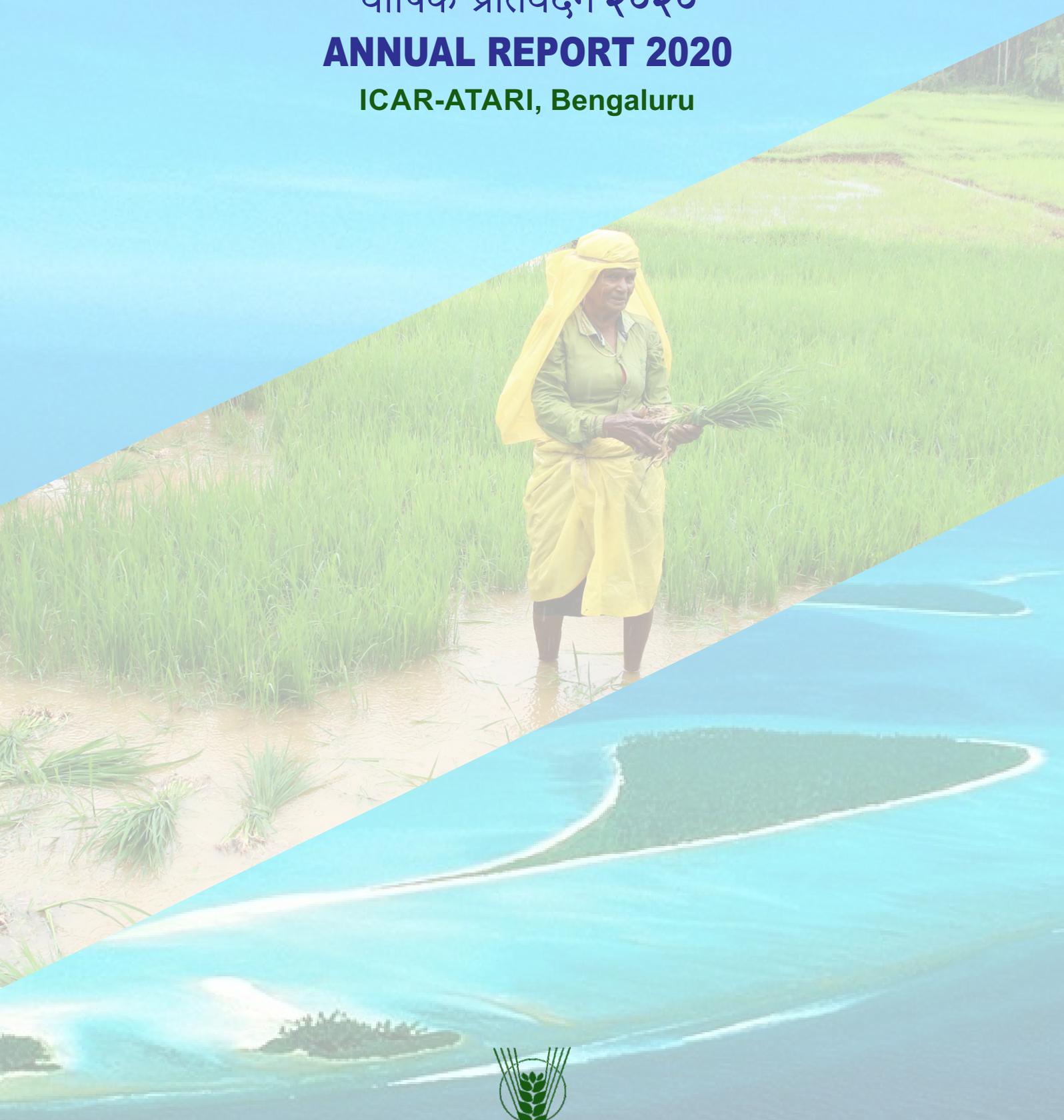


Paddy Nursery (KVK, Kodagu)



Painted by  
Siddappa. C Angadi  
KVK, Bagalkot

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Farmers would have to harness new innovations to match the changing dynamics and stay updated with market knowledge to get the maximum benefit to their efforts by getting better and profitable prices.

## Preface

The pandemic lockdown across the country has brought economic activity to a near halt. Amid this situation, agricultural sector proved as the silver lining for the Indian economy. Krishi Vigyan Kendras (KVKs) are playing significant role during this difficult period through their innovative approaches and technological support with respect to resource conservation to minimise the cost of cultivation, profitable integration of livestock, poultry, fisheries and other allied components into farmers' production system, integrated management of nutrients, pests and diseases, value addition and finding market for farm produces.

The new agricultural policy allows farmers to sell their produces to whomever and wherever they want. KVKs in Karnataka, Kerala and Lakshadweep played a significant role in bringing awareness among the farmers about the new agricultural policy reforms brought by the Government of India and played a lead role in synergy with other development departments towards realising the goal of doubling the farmers' income apart from ensuring food, nutritional and livelihood security to

millions of farm families in these states. It is evident from the reported activities during this year, KVKs focussed on policy and innovation led transformation of agriculture for improved nutrition and agricultural income through sustainable technological interventions and inclusive growth.

Some of the significant milestone activities carried out during the year like first Institute Research Council (IRC) meeting of ICAR-ATARI, Bengaluru, gender sensitisation under Farmer FIRST programme, strengthening of online reporting system, inter institutional research programmes on technological impact assessment, restructuring of website, geo tagging of demonstrations and field activities, introduction of system driven monitoring mechanism and ATARI newsletter helped the KVK system in the zone to undertake their activities more effectively and efficiently.

This year KVKs in the zone conducted 258 on farm trials and assessed 572 technologies involving 1201 farmers. A total of 6337 frontline demonstrations were conducted to demonstrate the technology potential to the farmers. KVKs also organised 4185 capacity development courses benefiting 249250 farmers/women, 16265 rural youth and 8475 extension personnel. This year KVKs were supported with 521 sponsored programmes and 112 vocational training courses benefiting 28418 participants

KVKs also carried out 1.11 lakh frontline extension activities which created awareness among 12.08 lakh farmers. Produced 2672.69 q of seeds of different crop varieties, 29.15 lakh planting materials, 3.08 lakh livestock strains and fish fingerlings benefiting 2.03 lakh farmers. Produced and supplied 4061.22 q of bio-products through which 1.14 lakh farmers were benefited. Sent 8588 text messages through Kisan mobile advisories to 18.13 lakh farmers. A total of 30167 samples of soil, water, plant and organic manure were analysed based on which 27998 soil health cards were distributed to farmers.

Our hearty congratulations to award winning innovative farmers Shri. S.C Thimmaiah from Karnataka and Shri.T.Purusothaman from Kerala for receiving ICAR Jagjivan Ram Abhinav Kisan Puraskar Award. Our hearty wishes to Bagalakote KVK for receiving the Zonal award for the Best KVK. The activities carried out by ICAR-ATARI, Bengaluru and its constituent KVKs during the year 2020 were compiled and presented here with good illustrations and photos. My hearty congratulations to our ATARI, KVK and Director of Extension team for giving their best efforts and support to prepare this holistic and focussed report. The content presented in the Annual Report 2020 reflects the technology innovation activities carried out by the KVKs of Karnataka, Kerala and Lakshadweep through their innovative approaches and inclusive programmes.

I am grateful to Honourable Secretary, DARE and Director General ICAR, Dr.T. Mohapatra for the motivation and guidance provided to us for undertaking our activities effectively and efficiently. My sincere thanks to Dr.A.K.Singh, DDG (AE) for the guidance and support provided to us. I also thank Dr.Randhir Singh, ADG (AE) for being with us in implementing the mandated activities of our institute and KVKs.

It is my honour and pleasure to publish the Annual Report 2020 of ATARI, Bengaluru and KVKs of Karnataka, Kerala and Lakshadweep as a testimony of the valuable contribution made towards farmers' prosperity through sustainable agricultural development.

(V. VENKATASUBRAMANIAN)  
Director

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## Executive Summary

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Executive summary is presented in Hindi followed by English.



## कार्यकारी सारांश

भारतीय कृषि अनुसंधान परिषद (भा.कृ.अ.प.), नई दिल्ली के अग्रिम पंक्ति के कृषि सम्बंधी कार्यक्रमों के विस्तार के लिये देश में भा.कृ.अ.प. – कृषि विज्ञान केन्द्रों का राष्ट्रव्यापी नेटवर्क है। कृषि विज्ञान केन्द्रों की गतिविधियों की निगरानी और समन्वयन के कार्य को, राष्ट्रीय स्तर पर कृषि विस्तार विभाग और क्षेत्रीय स्तर पर भा.कृ.अ.प. – कृषिप्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान (अटारी) द्वारा उप महानिदेशक (डी.डी.जी.), कृषि विस्तार, भा.कृ.अ.प., नई दिल्ली के समग्र निर्देशन और समर्थन से संचालित किया जाता है। भा.कृ.अ.प.–अटारी, बंगलुरु, ने क्षेत्र 11 में 48 कृषि विज्ञान केन्द्रों को स्थापित किया है जिनमें 33 कर्नाटक में, 14 केरल और 1 लक्षद्वीप में हैं जिनमें से 33 का प्रशासनिक नियंत्रण राज्य कृषि विश्वविद्यालयों के, 8 का गैर सरकारी संगठनों और 7 का भा.कृ.अ.प. के संस्थानों के हाथ में है।

कृषि विज्ञान केन्द्रों का अधिदेश अनुप्रयोग एवं क्षमता विकास के लिये प्रौद्योगिकीयों का मूल्यांकन और प्रदर्शन करना है। इस अधिदेश को खेतों में परीक्षण, अग्रिम पंक्ति के प्रदर्शन, क्षमता विकास, विस्तार गतिविधियों और कृषि परामर्शों, प्रौद्योगिकी उत्पादों के उत्पादन एवं वितरण द्वारा पूर्ण किया जाता है जिससे वैज्ञानिक खेती के लिये जिला स्तर पर यह कृषि विज्ञान केन्द्र ज्ञान और संसाधन के केन्द्र के रूप में कार्य करते हैं।

### अटारी बंगलुरु में हुई मुख्य गतिविधियां

- श्री कैलाश चौधरी, माननीय केन्द्रीय कृषि एवं किसान कल्याण राज्य मंत्री, ने 'क्षेत्र 11, जिसमें कर्नाटक, केरल और लक्षद्वीप शामिल हैं, के कृषि विज्ञान केन्द्रों की आभासीय वार्षिक क्षेत्रीय समीक्षा कार्यशाला' का आयोजन अटारी बंगलुरु में 14 जुलाई, 2020 को किया गया।
- भा.कृ.अ.प.– अटारी, बंगलुरु की संस्थान अनुसंधान समिती की प्रथम मीटिंग का आयोजन 2-3 सितम्बर, 2020 को किया गया। मीटिंग में 10 परियोजनाओं, 4 पहले से चल रही और 6 नई प्रस्तावित अनुसंधान परियोजनाओं पर विचार विमर्ष किया गया। दो अंतरा-संस्थान परियोजनाओं, नामशः भा.कृ.अ.प.– आइ.आइ.एच.आर., बंगलुरु के सहयोग से चल रही 'तकनीकी हस्तक्षेपों के प्रभाव का आकलन' और भा.कृ.अ.प.– गन्ना प्रजनन संस्थान, कोयम्बतूर सहयोग से चल रहे 'शूगरकेनपीडिया' पर भी विचार विमर्ष किया गया।
- भा.कृ.अ.प.– अटारी, बंगलुरु ने भा.कृ.अ.प.– सी.पी.सी.आर. आइ., भा.कृ.अ.प.– एन.आइ.ए.एन.पी., भा.कृ.अ.प.– आइ.आइ.एच.आर. और भा.कृ.अ.प.– सी.आइ.एफ.टी. के 'किसान खेत, नवाचार, संसाधन, विज्ञान और प्रौद्योगिकी परियोजना' केन्द्रों के साथ मिलकर 'लिंग और महामारी : चुनौतियाँ एवं अवसर' विषय पर डिजिटल प्रवचन श्रृंखला का आयोजन 10-12 अगस्त, 2020 को किया गया, जिसमें पूरे देश से आये 160 प्रतिभागियों ने भाग लिया।

- भा.कृ.अ.प. – अटारी, बंगलुरु ने वर्ष के दौरान कार्यक्रमों की एक विस्तृत श्रृंखला, नामशः कृषि विज्ञान केन्द्रों के विभिन्न पहलुओं की वार्षिक समीक्षा (2019) के साथ (2020-21) की कार्यशालाओं की कार्य योजना, उत्तर कन्नड़ा के भा.कृ.अ.प. – कृषि विज्ञान केन्द्र के प्रशासनिक भवन का उदघाटन, राज्यभाषा सप्ताह, अनुसंधान परामर्ष समिति, महात्मा गाँधी की 150वीं जन्म वर्षगाँठ, सतर्कता जारुकता सप्ताह, संस्थान स्थापना दिवस, स्वच्छता पखवाड़ा और माननीय प्रधान मंत्री जी के सीधे प्रसारण में कृषि विज्ञान केन्द्र के किसानों की भागीदारी का आयोजन किया।

### कृषि विज्ञान केन्द्रों की प्रौद्योगिकी मूल्यांकन के क्षेत्र में मुख्य उपलब्धियां

- इस वर्ष कुल 258 खेतों में परीक्षण किये गये जिनमें से 215 फसलों से, 33 पशुधन से और 10 गृह विज्ञान उपक्रमों से सम्बंधित थे। कुल मिला कर 572 प्रौद्योगिकीयों का मूल्यांकन किया गया जिनमें से 497 फसलों से, 60 पशुधन से और 15 गृह विज्ञान उपक्रमों से सम्बंधित थी। इन गतिविधियों में 1201 किसानों ने फसलों से सम्बंधित, 145 किसानों ने पशुधन से सम्बंधित और 109 किसानों ने गृह विज्ञान से सम्बंधित उपक्रमों में भाग लिया।
- विभिन्न फसल वर्गों से सम्बंधित खेतों में किये गये कुल 215 परीक्षणों में से 150 का कर्नाटक में और 65 का केरल में कार्यान्वयन किया गया। कुल 497 तकनीकी विकल्पों में से 344 कर्नाटक में और 153 का केरल में परीक्षण/मूल्यांकन किया गया। कर्नाटक के कृषि विज्ञान केन्द्रों ने 628 किसानों के खेतों में और केरल के कृषि विज्ञान केन्द्रों ने 319 किसानों के खेतों में परीक्षण किये जिनकी कुल संख्या 947 बनी।
- पशुधन वर्ग में खेतों में किये गये कुल 33 परीक्षणों में से 16 का कर्नाटक में और 17 का केरल में कार्यान्वयन किया गया। इस कार्य को 145 किसानों के खेतों में लगाकर सम्पूर्ण किया गया जिनमें से 78 किसानों के खेत कर्नाटक में और 67 किसानों के खेत केरल में थे। कुल 60 तकनीकी विकल्पों में से 33 कर्नाटक में और 27 का केरल में परीक्षण/मूल्यांकन किया गया।
- गृह विज्ञान से सम्बंधित उपक्रमों में से कर्नाटक के 4 कृषि विज्ञान केन्द्रों से और केरल के 3 कृषि विज्ञान केन्द्रों से रिपोर्ट प्राप्त हुई। कुल 15 तकनीकी विकल्पों का आकलन 109 परीक्षणों के माध्यम से किया गया जिसके लिये 10 फार्म परीक्षण लगाये गये।

### अग्रिम पंक्ति के प्रदर्शन

- कुल 6,337 अग्रिम पंक्ति के प्रदर्शनों में से 1,096 को अनाजों एवं मोटे अनाजों (मिलेट)वाली फसलों, 201 को तिलहनी फसलों, 46 को दलहनी फसलों, 130 को व्यावसायिक

- फसलों, 71 को रेशे वाली फसलों, 225 को चारे वाली फसलों, 10 को हरी खाद वाली फसलों, 472 को सब्जी वाली फसलों, 61 को कंद वाली फसलों, 243 को फलों वाली फसलों, 40 को फूलों वाली फसलों, 75 को रोपण वाली फसलों, 195 मसालों वाली फसलों, 10 औषधीय फसलों, 421 विभिन्न फसलों के संकरों पर लगाया गया। इसके अलावा इनमें कृषि उपकरणों पर 154 प्रदर्शनीयां, पशुधन और मत्स्यपालन पर 786 प्रदर्शनीयां और 1,682 उपकरणों पर प्रदर्शनीयां कर्नाटक, केरल और लक्षद्वीप में आयोजित की गई।
- कर्नाटक राज्य में धान में प्रौद्योगिकीयों, जैसेकि एकीकृत फसल प्रबंधन, एकीकृत पोषक तत्व प्रबंधन, एकीकृत कीट एवं रोग प्रबंधन, एकीकृत रोग प्रबंधन, एकीकृत कीट प्रबंधन, समस्याग्रस्त मृदाओं का सुधार, संसाधन संरक्षण प्रौद्योगिकीयां एवं उन्नत प्रजातियों, नामशः जी.एन.वी.-10-89, आर.एन.इ.-15048, गंगावति सोना, श्यादरीपंचमुखी, लवणता सहनशील प्रजाति जी. जी.वी.-05-01 तथा जल प्रबंधन तकनीकों के प्रदर्शनों में कुल मिलाकर दाना उत्पादन में 14.27: की बढ़ोतरी उनके अपने अपने चैकों के मुकाबले देखी गई। इसी प्रकार केरल राज्य में भी एकीकृत फसल प्रबंधन, एकीकृत पोषक तत्व प्रबंधन, एकीकृत कीट एवं रोग प्रबंधन, ऑर्गेनिक खेती और श्रेयास, वी.टी.एल.-10 तथा मनुरतना प्रजातियों के प्रदर्शन से चैकों के औसत 41.10 किंवटल/हेक्टेयर के मुकाबले 52.52 किंवटल/हे. का औसत उत्पादन प्राप्त हुआ।
- गेहूँ में मानक के औसत 27.98 किंवटल/हे. के मुकाबले एकीकृत फसल प्रबंधन तथा प्रजातियों यू.ए.एस.-304 और डी. डी.के. 1029 के कारण 31.72 किंवटल/हे. का औसत उत्पादन दर्ज किया गया। कर्नाटक राज्य में मक्का में मुकाबले एकीकृत रोग प्रबंधन और एकीकृत कीट एवं रोग प्रबंधन के कारण उच्च उत्पादन दर्ज किया गया जो क्रमशः 68.00 और 59.88 किंवटल/हे. था।
- कर्नाटक में उन्नत प्रजातियों एस.पी.वी.-2217 और जी.एस.-23 तथा फाल आर्मीवॉर्म प्रबंधन प्रौद्योगिकीयों के कारण रबी जवार में मानक के 11.60 किंवटल/हे. के मुकाबले 13.45 किंवटल/हे. औसतन उत्पादन अनुमानित किया गया। रागी/नचनि की प्रजाति के.एम.आर.-360 के प्रदर्शन में चैक के 24.12 किंवटल/हे. के मुकाबले 30.47 किंवटल/हे. औसत उत्पादन दर्ज किया गया। कंगनी/ककुम की अरहर में अन्तर फसलीकरण से चैक के 14,550 रुपये/हे. शुद्ध लाभ के मुकाबले 61,780 रुपये/हे. शुद्ध लाभ अनुमानित किया गया।
- कर्नाटक के कृषि विज्ञान केन्द्रों ने तिलहनी फसलों के अन्तरगत 77.0 हे. भूमि में मुंगफली पर 95 प्रदर्शन, सूरजमुखी पर 12, कुसुम पर 5, अलसी पर 5, तिल पर 22 और सोयबीन पर 62 प्रदर्शन लगाये। मुंगफली की फसल ने एकीकृत फसल प्रबंधन, एकीकृत पोषक तत्व प्रबंधन, एकीकृत कीट एवं रोग प्रबंधन और उन्नत प्रजातियों के प्रयोग करने पर किसानों द्वारा अपनाई जा रही पद्यति के 17.71 किंवटल/हे. के मुकाबले 21.33 किंवटल/हे. का औसत उत्पादन प्राप्त हुआ। तिल से भी एकीकृत फसल प्रबंधन और एकीकृत रोग प्रबंधन के प्रयोग से, अलसी में एन.एल.-115 प्रजाति ने और सूरजमुखी में एकीकृत फसल प्रबंधन के उपयोग से उच्च उत्पादन तथा अधिक शुद्ध लाभ प्राप्त हुआ। सोयबीन की प्रजाति डी.एस.बी.-23, एकीकृत पोषक तत्व प्रबंधन तथा एकीकृत कीट एवं रोग प्रबंधन से किसानों द्वारा अपनाई जा रही पद्यति के 13.04 किंवटल/हे. के मुकाबले 15.41 किंवटल/हे. का औसत उत्पादन अनुमानित किया गया।
- कर्नाटक के कृषि विज्ञान केन्द्रों ने दलहनी फसलों के अन्तरगत अरहर पर 242 प्रदर्शन, मूंग पर 47, उड़द पर 22, कुलथी पर 21, सेमपर 10, लोबिया पर 5 और चने पर 118 प्रदर्शन कुल 170.20 हेक्टेयर में लगाये गये। प्रदर्शित की गई प्रौद्योगिकीयों में से अरहर का मक्के में अन्तर फसलीकरण से सार्वधिक 22.34 किंवटल/हे. उत्पादन प्राप्त हुआ जिसके बाद उन्नत प्रजाति जी.आर.जी.-152 से 15.65 किंवटल/हे. का उत्पादन प्राप्त हुआ। मूंग की उन्नत प्रजाति बी.जी.एस.-9 ने सार्वधिक 8.00 किंवटल/हे. उत्पादन जबकि मानक प्रजाति में यह 6.47 किंवटल/हे. देखा गया। उड़द में एकीकृत फसल प्रबंधन और प्रजाति एल.बी.जी.-791 ने कुल मिलाकर मानक के मुकाबले 65.63: की वृद्धि देखी गई।
- रबी मौसम के दौरान चने में प्रजाति प्रदर्शनों में एकीकृत फसल प्रबंधन और एकीकृत कीट एवं रोग प्रबंधन के प्रयोग से उनके चैकों के ऊपर 19.31: की वृद्धि देखी गई। लोबिया प्रजाति के. बी.आर.-1 के उपयोग में आने से 15.40 किंवटल/हे. के उच्च उत्पादन के कारण 41,000 रुपये/हे. का शुद्ध लाभ कर्नाटक में देखा गया।
- मुख्य व्यावसायिक फसलों, जैसेकि शहतूत और गन्ने पर कुल 130 प्रदर्शनों को कर्नाटक के कृषि विज्ञान केन्द्रों द्वारा 54 हेक्टेयर में लगाया गया। गन्ने में एकीकृत फसल प्रबंधन, एकीकृत कीट प्रबंधन और मृदा प्रबंधन प्रौद्योगिकीयों के प्रयोग से किसान के खेतों में चैक के 935.81 किंवटल/हेक्टेयर गन्ना उत्पादन के मुकाबले 1083.08 किंवटल/हे. का औसत उत्पादन प्राप्त हुआ।
- कर्नाटक में कपास में एकीकृत कीट एवं रोग प्रबंधन और अन्तर फसलीकरण के प्रदर्शनों में बीज उत्पादन को क्रमशः 20.05 और 22.49 किंवटल/हे. कर्नाटक राज्य में दर्ज किया गया।
- चारा फसलों पर कुल 220 प्रदर्शन संचालित किये गये जिन्हें कर्नाटक के कृषि विज्ञान केन्द्रों द्वारा 59 हेक्टेयर में लगाया गया था। प्रौद्योगिकीयों, जैसेकि एकीकृत फसल प्रबंधन, चारा फसलों की उन्नत प्रजातियों, जैसेकि चारे के लिये जवारकी को. एफ.एस.-29 और को.एफ.एस.-31 प्रजातियां, जिनके अलावा स्टाइलो घास, रिजका और चारे वाले पेड़ों से 1364.65 टन/हे. औसतन हरा चारा प्राप्त हुआ जिससे 108,055/हे. का शुद्ध लाभ अनुमानित किया गया।

- सब्जी फसलों, जैसेकि चौलाई, बैंगन, गोभी, मिर्च, लौकी, खीरा, बल्लार(वाल), सेम, ग्वारफली, हरे मटर, प्याज़, तुरई, करेला, लम्बी ग्वार और लोबिया को उन्नत प्रौद्योगिकीयों द्वारा 472 किसानों के खेतों में 134.30 हेक्टेयर में कर्नाटक, केरल एवं लक्षद्वीप के कृषि विज्ञान केन्द्रों द्वारा प्रदर्शित किया गया।
- मुख्यकंद फसलों, जैसेकि आलू, कसावा, शक्कर कंदी और छोटी अरबी के प्रदर्शन, 7.67 हेक्टेयर भूमि में, क्षेत्र – 11 के कृषि विज्ञान केन्द्रों द्वारा कर्नाटक में संचालित किये गये। कसावा में एकीकृत पोषक तत्व प्रबंधन, एकीकृत फसल प्रबंधन और एकीकृत कीट प्रबंधन प्रौद्योगिकीयों के प्रयोग से उच्च औसत उत्पादन 280.33 किंवटल/हे. प्राप्त हुआ जबकि चैक में यह आंकड़ा 205.00 किंवटल/हे. देखा गया। केरल में चैक से प्राप्त 1,91,464 रुपये/हे. शुद्ध लाभ के मुकाबले इन प्रौद्योगिकीयों के प्रयोग से 3,36,075 रुपये/हे. का शुद्ध लाभ अनुमानित किया गया।
- मुख्य फलों, जैसेकि केला, नींबू, आम, पपीता, अनार, संतरा, स्ट्रॉबेरी और अमरूद पर कुल 240 प्रदर्शन 72.94 हेक्टेयर में संचालित किये गये। प्रदर्शित की गई प्रौद्योगिकीयों में से केले में एकीकृत रोग प्रबंधन ने जी.-9 में सार्वधिक 747.50 किंवटल/हे. और येलाककी में 362.20 किंवटल/हे. उत्पादन के कारण इनसे मानकों के मुकाबले बेहतर आर्थिक लाभ प्राप्त हुआ। अंगूर में रोग प्रबंधन प्रौद्योगिकी के अपनाने से मानक के 339.00 किंवटल/हे. फल उत्पादन के मुकाबले 374.50 किंवटल/हे. फल प्राप्त हुए। केरल में स्ट्रॉबेरी के प्रदर्शन से 300.00 किंवटल/हे. फल से 8,42,500 रुपये/हे. का शुद्ध उच्च लाभ प्राप्त हुआ।
- रोपित फसलों में से सुपारी, नारियल और कॉफी पर 75 प्रदर्शन 23.94 हेक्टेयर में क्षेत्र – 11 के कृषि विज्ञान केन्द्रों द्वारा संचालित किये गये। केरल की महत्वपूर्ण रोपित फसल नारियल पर एकीकृत रोग प्रबंधन, एकीकृत पोषक तत्व प्रबंधन और सूखा प्रबंधन प्रौद्योगिकीयों के प्रदर्शन से मानक से प्राप्त 8,987 नट/हे./वर्ष के मुकाबले औसत 13,235 नट/हे./वर्ष प्राप्त हुए।
- मसालों में काली मिर्च, लहसुन, अदरक, हल्दी, पान, मिर्च और धनिया पर 21.42 हेक्टेयर भूमि में 86 प्रदर्शन कर्नाटक में लगाये गये जबकि केरल में 3.67 हेक्टेयर में 109 प्रदर्शन काली मिर्च, अदरक और हल्दी पर कृषि विज्ञान केन्द्रों द्वारा संचालित किये गये।
- फूलों वाली फसलों में गुलदउदी, गुलाब, रजनीगंधा तथा चमेली पर 6.60 हेक्टेयर भूमि में, कृषि विज्ञान केन्द्रों द्वारा कर्नाटक में प्रदर्शन संचालित किये गये। गुलदउदी पर एकीकृत फसल प्रबंधन प्रौद्योगिकी के प्रयोग से मानक के 48.80 किंवटल/हे. के मुकाबले 57.50 किंवटल/हे. का फूलों का उत्पादन प्राप्त हुआ।
- विभिन्न फसलों, जैसेकि मक्का, टमाटर, सूरजमुखी, बी.टी. कपास, भिंडी, करेला, तुरई, मिर्च, सेम, पोल बीन, टमाटर, पपीता और तरबूज पर कृषि विज्ञान केन्द्रों द्वारा कर्नाटक में 125.90 हेक्टेयर में 1,421 प्रदर्शन इन फसलों के संकरों पर संचालित किये गये।
- षि यंत्रिकरण के अन्तरगत ड्रम बीजक और धान में धान की भूसी का प्रवाहक (बेलर), बीज सह उर्वरक ड्रिल, साइकल निराई उपकरण, हार्वेस्टर और रागी में उड़ाने वाला यन्त्र, गन्ने का मशीनी हार्वेस्टर, अरहर के लिये सौर टुकाई मशीन, कपास के लिये कतरनी मशीन और सुरक्षित भंडारण उपकरण पर प्रदर्शन कर्नाटक में लगाये गये। दूसरी तरफ केरल में केले में गुच्छों को ढकने का उपकरण और उर्वरक/कीटनाशक का ड्रोन द्वारा स्प्रे के प्रदर्शन लगाये गये।
- मधुमक्खी पालन, पोषण उद्यान, मत्स्य पालन, मछली अपशिष्ट खाद, नारियल के रेशे से बनी खाद, मशरूम, नर्सरी, पॉल्टरी, रेशम के कीड़ों का पालन, भंडारण, मूल्य संवर्धन और अन्य पर कुल 1248 प्रदर्शन इकाइयां कृषि उद्यमों पर स्थापित की गई ताकि कर्नाटक, केरल एवं लक्षद्वीप के 1682 किसानों /कृषक महिलाओं को लाभ मिल सके।
- पशुधन, जिसमें पॉल्टरी भी शामिल थी, पर कुल 663 प्रदर्शन इकाइयां और मत्स्य पालन पर 101 प्रदर्शन इकाइयां स्थापित की गई ताकि कर्नाटक, केरल एवं लक्षद्वीप के 675 किसानों /कृषक महिलाओं को लाभ मिल सके।
- षक महिलाओंको शक्तिशाली बनाने के लिये 34,904 भागीदारों के लिये कर्नाटक के कृषि विज्ञान केन्द्रों द्वारा 1,616 परियोजनाओं को कार्यान्वित किया गया। स्वास्थ्य और पोषण तथा बच्चों से सम्बंधित अन्य पहलुओं पर कुल 196 परियोजनाओं को 2014 बच्चों के लिये भी कार्यान्वित किया गया। इसी प्रकार केरल के कृषि विज्ञान केन्द्रों द्वारा 969 परियोजनाओं को 33,380 कृषक महिलाओं को शक्तिशाली बनाने के लिये कार्यान्वित किया गया। स्वास्थ्य और पोषण तथा बच्चों से सम्बंधित अन्य पहलुओं पर कुल 36 परियोजनाओं को 8,069 बच्चों के लिये भी कार्यान्वित किया गया।

### क्षमता/सामर्थ्य विकास

- क्षमता विकास के अन्तरगत कृषि विज्ञान केन्द्रों द्वारा आयोजित कुल 4,185 पाठ्यक्रमों में से किसानों/कृषक महिलाओं के लिये 3,544 पाठ्यक्रमों, ग्रामीण युवकों के लिये 440 पाठ्यक्रमों और विस्तार कर्मचारियों के लिये 201 पाठ्यक्रमों का आयोजन किया गया था। इन पाठ्यक्रमों द्वारा कुल 2,73,990 जनों को प्रशिक्षित किया जिनमें से 2,49,250 किसान/कृषक महिलायें थी, 16,265 ग्रामीण युवक और 8,475 विस्तार कर्मचारी थे। इसके अतिरिक्त 521 प्रयोजित और 112 पेशेवर पाठ्यक्रमों को क्रमशः 19,039 और 9,379 भागीदारों के लिये आयोजित किया गया।
- किसानों और कृषक महिलाओं के लिये क्षमता विकास का प्रमुख क्षेत्र फसल उत्पादन था जिसके लिये 758 पाठ्यक्रमों को संचालित किया गया जिसमें 57,650 किसानों/कृषक महिलाओं ने भाग लिया। फसल सुरक्षा पर 526 पाठ्यक्रमों और गृह विज्ञान/महिला

सशक्तिकरण पर 492 पाठ्यक्रमों का आयोजन इनके महत्व को दर्शाता है जबकि पशुधन उत्पादन एवं प्रबंधन पर 381 पाठ्यक्रम आयोजित किये गये।

- ग्रामीण युवकों के लिये एकीकृत पोषक तत्व प्रबंधन, एकीकृत कीट एवं रोग प्रबंधन, ऑर्गेनिक खेती और पोषक उद्यान (115 पाठ्यक्रम, 3,211 भागीदार) और मूल्य संवर्धन (49 पाठ्यक्रम, 1,460 भागीदार) प्रमुख प्रशिक्षण क्षेत्र रहे।
- विस्तार कर्मचारियों के लिये मूल्य संवर्धन, मृदा उर्वरता, एकीकृत कृषि प्रणाली, सटीक खेती और प्रक्रमण इत्यादि प्रमुख प्रशिक्षण क्षेत्रों पर 46 पाठ्यक्रमों में 3,211 की भागीदारी रही जिनसे कम महिलाओं और बच्चों की देखभाल पर 29 पाठ्यक्रम आयोजित किये गये जिनमें 1,479 को प्रशिक्षित किया गया।
- फसल उत्पादन और उत्पादकता पर 96 पाठ्यक्रम प्रायोजित थे जिनमें 4,593 युवकों/विस्तार कर्मचारियों ने भाग लिया। अन्य विषयों, जैसेकि एकीकृत पोषक तत्व प्रबंधन, मधुमक्खी पालन और मशरूम की खेती पर 93 कार्यक्रम आयोजित किये गये जिनमें 562 जनों ने भाग लिया।
- पेशेवर विकास पाठ्यक्रमों में से अधिकतम भेड़ और बकरी पालन पर 13 पाठ्यक्रम जिनमें 452 भागीदार थे जबकि डेरी फार्मिंग पर 11 पाठ्यक्रमों में 308 भागीदार रहे।

### विस्तार के महत्वपूर्ण/अगली पंक्ति के कार्यक्रम

- कृषि विज्ञान केन्द्रों ने 1.11 लाख महत्वपूर्ण विस्तार गतिविधियां संचालित की गई जिससे 12.08 लाख किसानों (10.78 लाख सामान्य किसान और 1.31 लाख अनुसूचित जाति/अनुसूचित जनजाति) और 0.37 लाख विस्तार कर्मचारियों में प्रजातियों, उत्पादन प्रौद्योगिकियों, एकीकृत कीट एवं रोग प्रबंधन, पशु स्वास्थ्य एवं पोषण, पॉल्टरी उत्पादन, मत्स्यपालन प्रबंधन और मानव पोषण पर जागरूकता पैदा हुई।
- कृषि विज्ञान केन्द्रों द्वारा 406 विस्तार साहित्य, 406 लोकप्रिय लेख और 260 अनुसंधान पेपर/सारांश प्रकाशित किये जिसके अलावा 2090 समाचार पत्रों में रिपोर्टें छपवाई गईं, रेडियो पर 509 समाचार/वार्तायें तथा टी.वी. पर 229 समाचार/वार्तायें प्रस्तुत की गईं और 28 सी.डी./डी.वी.डी. बनाई गईं।

### तकनीकी निवेशों का उत्पादन

- विभिन्न फसलों की प्रजातियों के 2,672.69 किंवटल बीजों, विभिन्न फसलों और संकरों की 29.15 लाख रोपण समग्री, पशुधन के स्ट्रेनों और मछली के बच्चों की 3.08 लाख संख्या का उत्पादन कर उनकी आपूर्ति की गई जिससे 2.03 लाख किसान लाभान्वित हुए।
- किसानों के लिये 4061.22 किंवटल जैव-उत्पादों को उत्पादित कर उन्हें वितरित कर जैव-नियन्त्रण तकनीकों को अपनाने के लिये प्रेरित किया जिससे कृषि प्रणाली में रसायनों के प्रयोग में कमी लाई जा सके।

### किसान मोबाइल सलाहकार सेवायें

- क्षेत्र-11 के 39 कृषि विज्ञान केन्द्रों द्वारा 18.13 लाख किसानों को 8,588 लिखित संदेश भेजे गये। इनमें से 3961 संदेश फसलों से, 2440 मौसम से, 1051 दूसरे उद्यमों से, 927 पशुधन से, 335 जागरूकता और 144 क्रय-विक्रय से सम्बंधित थे।

### मृदा, जल और पादप विश्लेषण

- कृषि विज्ञान केन्द्रों द्वारा मृदा, जल, पौधों और ऑर्गेनिक खाद के नमूनों का विश्लेषण किया गया जिन्हें 11,906 गाँवों के 1,94,808 किसानों से प्राप्त किया गया था। इस कार्य के आधार पर 27,998 मृदा स्वास्थ्य कार्ड बनाकर वितरित किये गये।
- विश्व मृदा दिवस 5 दिसम्बर, 2020 को क्षेत्र-11 के 43 कृषि विज्ञान केन्द्रों द्वारा मनाया गया जिसमें 4,620 किसानों के अलावा मंत्रियों, सांसदों, विधान सभा सदस्यों, 69 अन्य जन प्रतिनिधियों और 287 अफसरों ने भाग लिया। इस अवसर पर 2,165 मृदा स्वास्थ्य कार्ड वितरित किये गये। विश्व मृदा दिवस उत्सव का 168 मीडिया कवरेज के द्वारा व्यापक प्रचार किया गया।

### वर्षा जल संचयन इकाइयां

- वर्षा जल संचयन और पुनःचक्रण की 16 इकाइयों को 16 कृषि विज्ञान केन्द्रों में स्थापित किया गया जिनका उपयोग 50 क्षमता विकास पाठ्यक्रमों और 51 प्रदर्शनों में किया गया। इसके अलावा इसके अतिरिक्त जल संचयन का प्रयोग कृषि विज्ञान केन्द्रों द्वारा 3,32,682 रोपण समग्रियों का उत्पादन कर उन्हें किसानों को वितरित करने के लिये किया गया। इन इकाइयों को देखकर इनसे 21,465 किसानों और 253 अफसरों को जल संचयन तकनीकों के बारे में विस्तृत जानकारी प्राप्त हुई।

### कृषि विज्ञान केन्द्रों के संमिलन/अभिसरण और सम्पर्क

- कृषि प्रौद्योगिकी प्रबंधन एजेंसी (आत्मा) के साथ अभिसरण के भाग के रूप में कृषि विज्ञान केन्द्रों ने आत्मा द्वारा आयोजित 845 कार्यक्रमों में न केवल भाग लिया अपितु आत्मा के सहयोग से 413 कार्यक्रमों का आयोजन भी किया।
- राष्ट्रीय कृषि विकास योजना, राष्ट्रीय खाद्य सुरक्षा मिशन, भारतीय कृषि अनुसंधान परियोजना के विभिन्न संस्थानों की परियोजनाओं और राष्ट्रीय कृषि एवं ग्रामीण विकास बैंक (नाबार्ड) वह प्रमुख एजेंसियां थी जिन्होंने कृषि विज्ञान केन्द्रों द्वारा आयोजित किये जाने वाले कार्यक्रमों और गतिविधियों को वित्त पोषित/समर्थित किया।

### सफलता की कहानियां

- कृषि विज्ञान केन्द्रों ने उत्पादकता और किसानों की आय बढ़ाने के आधार पर प्रौद्योगिकियों के प्रदर्शन का मूल्यांकन कर बहुत सारी सफलता की कहानियों को प्रलेखित किया जिनमें से कुछ नीचे दी जा रही हैं :-

## कर्नाटक

- कोराटागेरे तालुक के तोविनाकेरे में हल्लीसिरी स्वयं सहायता समूह ने रागी के लिये घरेलू स्तर पर प्रसंस्करण और मूल्य संवर्धन इकाई को स्थापित किया है (कृषि विज्ञान केन्द्र, तुमाकुरु-2)।
- रागी में मूल्य संवर्धन कर श्री सिद्दानागोवड़ा को अतिरिक्त आय प्राप्त हुई (कृषि विज्ञान केन्द्र, कोप्पल)।
- श्री बसवाराज हुलिकट्टी, जो पहले एक चिकित्सक प्रतिनिधि थे, डेयरी किसान बन गये (कृषि विज्ञान केन्द्र, हावैरी)।
- लॉकडाउन के दौरान बागबानी के उत्पादों, जैसेकि टमाटर, कटहल, फूल जैसेकि गुलाब, गुलदउदी और सब्जियों का किसानों द्वारा सीधा विपणन सफल उद्यम बन गया (कृषि विज्ञान केन्द्र, चिक्कबल्लापुरा)।
- एकीकृत कृषि प्रणाली के अपनाने से श्री दुरगप्पा अंगादी की आय में वृद्धि हुई (कृषि विज्ञान केन्द्र, शिवामोगा)।
- कोविड-19 के दौरान अंजीर में मूल्य संवर्धन करना सफल रहा (कृषि विज्ञान केन्द्र, बल्लारी)।
- सोयबीन की एक नई प्रजाति डी.एसबी-21 को 650 हेक्टेयर में फैलाया गया (कृषि विज्ञान केन्द्र, बेलगवी-2)।
- करेले को खूंटों से बांधकर सेम को एक रिले फसल के रूप में स्थापित किया गया (कृषि विज्ञान केन्द्र, रायचुर)।

## केरल

- जंगली सूअरों के विरुद्ध अरंडी के तेल आधारित जैव विकर्षक - इकोडोन (कृषि विज्ञान केन्द्र, तिरुवन्नतापुरम)।
- किसानों की भागीदारी से पर्ल स्पॉट मछली के बीज का उत्पादन और आपूर्ति (कृषि विज्ञान केन्द्र, एर्नाकुलम)।
- उठाये गई भूमि पट्टियों (रेज्ड बैड) पर प्लास्टिक शीटों से ढककर लाल राजमांह को उगाना (कृषि विज्ञान केन्द्र, पतनमतिट्टा)।
- एक परिवार के लिये घरों के भीतर लगाये जाने वाले पौधे एक स्थायी अजीविका साधन बने (कृषि विज्ञान केन्द्र, कोल्लम)।

## पुरस्कार एवं मान्यतायें

- भा.कृ.अनु.प. -आर. जगजीवन राम अभिनव किसान पुरस्कार, 2019 क्षेत्र-11 में कर्नाटक से श्री एस.सी. थिम्मइयाह, जो कोडगु जिले के नल्लूरगाँव से एक प्रगतिशील किसान हैं, वहीं केरल से एक अन्य प्रगतिशील किसान श्री पुरुशोतमन को मिले।
- पंडित दीनदयाल उपाध्याय कृषि विज्ञान राष्ट्रीयकेन्द्रप्रोत्साहन पुरस्कार, 2019 क्षेत्र-11 के लिये कृषि विज्ञान केन्द्र, बागलकोट को क्षेत्र के सर्वश्रेष्ठ कृषि विज्ञान केन्द्र चुने जाने के कारण मिला।

## विशिष्ट कार्यक्रम

- दालों पर समूह में अग्रिम पंक्ति के प्रदर्शनों के अन्तरगत 2,350 प्रदर्शनों को विभिन्न दलहनी फसलों, नामशः उड़द, मूंग, अरहर, चना और लोबिया पर कर्नाटक और केरल के किसान के खेतों

में 940 हेक्टेयर भूमि में कृषि विज्ञान केन्द्रों द्वारा संचालित किये गये।

- तिलहन फसलों पर समूह में अग्रिम पंक्ति के प्रदर्शनों के अन्तरगत 1,950 प्रदर्शनों को विभिन्न तिलहनी फसलों, नामशः मुंगफली, सोयबीन, सूरजमुखी, कुसुम, जतांगी, अरंडी, अलसी, सरसों और तिल पर कर्नाटक और केरल के किसान के खेतों में 780 हेक्टेयर भूमि में कृषि विज्ञान केन्द्रों द्वारा लगाये गये।
- कृषि विज्ञान केन्द्रों के 8 बीज नाभि केन्द्रों के एक समूह ने कुल 3,047.25 किंवटल दालों के बीज का उत्पादन किया जिसमें चने का 1,646.00 किंवटल, अरहर का 735.70 किंवटल, उड़द का 621.90 किंवटल, मूंग का 26.55 किंवटल, लोबिया का 13.80 किंवटल और लाल राजमांह का 3.30 किंवटल बीज शामिल थे।
- जलवायु लचीली कृषि में राष्ट्रीयवाचारों के अन्तरगत प्रौद्योगिकियों के प्रदर्शनों को, 7 सबसे अतिसंवेदनशील जिलों, नामशः बेलगवी (सूखे / उच्चतापमान), दावनगेरे (सूखे / उच्चतापमान), चिक्कबल्लापुरा (सूखे / उच्चतापमान), तुमकूर (सूखे), गदग (सूखे/उच्चतापमान) और कलबुर्गी (सूखे/उच्च तापमान) कर्नाटक में जबकि अल्लापुञ्जा (जलप्लावन/जलनिकासी) केरल में, कार्यान्वित किया गया।
- प्राकृतिक संसाधन प्रबंधन गतिविधियों के अन्तरगत 7 सूखा प्रवृत्त जिलों में गाँवों के समूह में कृषि कोजलवायु लचीला बनाने के लिये कुल 1,122 प्रदर्शनों को 1,150.28 हेक्टेयर भूमि पर कार्यान्वित किया गया।
- जलवायु लचीली कृषि में राष्ट्रीयवाचारों के अन्तरगत चयन किये गये 7 जिलों में फसल उत्पादन मॉड्यूल के अन्तरगत 1,489 प्रदर्शनों को 563.13 हेक्टेयर भूमि पर कार्यान्वित किया गया।
- सूखा प्रवृत्त जिलों में जलवायु लचीली कृषि में राष्ट्रीयवाचारों के अन्तरगत किये गये प्रदर्शनों में जलवायु लचीली प्रजातियों को, जिन्हें उपयुक्त पाया गया वह थी - उड़द (डी.बी.जी.वी.-5), रागी (एम.एल.-365), कंगनी (डी.एच.एफ.टी.-109-3), बहुवर्षीय चारा फसल (को.एफ.एस.-29 और 31) और अरहर (टी.एस.-3आर., बी.आर.जी.-1, -2 तथा -5), को 2,63,351.4 हेक्टेयर भूमि में बड़े पैमाने पर राज्य कृषि विभाग के द्वारा कर्नाटक के बेलगवी, चिक्कबल्लापुरा, दावनगेरे, गदाग, कलबुर्गी और तुमाकुरु जिलों में लगाया गया है।

## विस्तार निदेशालय द्वारा प्रौद्योगिकियों का सुदृढ़ीकरण

- विस्तार निदेशालय और उनके अधिकारियों ने निरीक्षण कर राज्य कृषि विश्वविद्यालयों, गैर सरकारी संगठनों और भारतीय कृषि अनुसंधान परिषद के अन्तरगत आने वाले कृषि विज्ञान केन्द्रों को तकनीकीतौर पर सुदृढ़ किया। विस्तार निदेशालय ने 40 वैज्ञानिक सलाहकार समितियों की मीटिंगों, 62 खेत दिवसों, 52 कार्यशालाओं/सेमिनारों, 6 प्रौद्योगिकी सप्ताहों और 99 प्रशिक्षण कार्यक्रमों में भाग लिया। खेत स्तर पर कृषि विज्ञान केन्द्रों द्वारा संचालित किये गये 43 खेत परीक्षणों और 93 अग्रिम पंक्ति के प्रदर्शन प्लॉटों का निरीक्षण जाकर किया गया।

## अनुसंधान परियोजनायें

- भा.कृ.अनु.प. अटारी के विज्ञानिकों द्वारा संचालित संस्थान की दो अनुसंधान परियोजनाओं, नामशः 'किसान खेत, नवाचार, संसाधन, विज्ञान और प्रौद्योगिकी परियोजनाके अन्तरगत डेयरी उत्पादन में हस्तक्षेपों का प्रभाव' और 'युवाओं में कृषि आधारित उद्यमिता विकास पर अध्ययन' के साथ साथ एक बाह्य रूप से वित्त पोषित अनुसंधान परियोजना – 'नवीन विस्तार विधियां और दृष्टिकोण पर नेटवर्क परियोजना' पर कार्य किया गया।

## प्रकाशन

- भा.कृ.अनु.प. अटारी के विज्ञानिकों ने 3 अनुसंधान पेपरों को प्राकशित किया, राष्ट्रीय/अन्तर राष्ट्रीय सम्मेलनों में 1 पेपर प्रस्तुत किया, 7 किताबों/चैप्टरों और 1 रिपोर्ट को संशोधित किया। कर्नाटक के कृषि विज्ञान केन्द्रों के कर्मचारियों द्वारा 234 अनुसंधान पेपरों/सारांशों, 121 तकनीकी रिपोर्टों, 162 तकनीकी बुलेटिनों, 312 लोकप्रिय लेखों और 305 विस्तार साहित्य प्रस्तुत/प्रकाशित किया गया जबकि केरल के कृषि विज्ञान केन्द्रों के कर्मचारियों द्वारा 26 अनुसंधान पेपरों/सारांशों, 16 तकनीकी रिपोर्टों, 8 तकनीकी बुलेटिनों, 91 लोकप्रिय लेखों और 101 विस्तार साहित्य प्रस्तुत/प्रकाशित किया गया। लक्षद्वीप कृषि विज्ञान केन्द्रों के कर्मचारियों द्वारा कृषि और उससे सम्बंधित उद्यमों के विभिन्न तकनीकी पहलुओं पर 3 लोकप्रिय लेखों को प्रकाशित किया गया।

## मानव संसाधन विकास

- इलेक्ट्रॉनिक्स और सूचना प्रौद्योगिकी मंत्रालय, भारत सरकार के सहयोग से एक ऑनलाइन समर प्रशिक्षण कार्यक्रम का आयोजन

प्रोग्राम सहायकों (कम्प्यूटर) के लिये 'फुल स्टैक वैब विकास' पर 1 से 14 अक्टूबर, 2020 के दौरान किया गया। इस प्रशिक्षण में क्षेत्र-11 के कृषि विज्ञान केन्द्रों से 30 कम्प्यूटर प्रोग्राम सहायकों और भा.कृ.अनु.प. अटारी, बंगलुरु के प्रमुख तकनीकी अधिकारी (कम्प्यूटर) ने भाग लिया।

## कार्यशालायें, मीटिंगें और सम्मेलन

- संस्थान के निदेशक/विज्ञानिकों/अधिकारियों ने 151 कार्यशालाओं/मीटिंगों/सम्मेलनों/सेमिनारों/प्रशिक्षण कार्यक्रमों को संचालित किया या उनमें भाग लिया।

## कर्मचारी

- भा.कृ.अनु.प. अटारी, बंगलुरु के कुल कर्मचारियों की स्वीकृत संख्या 18 है जिनमें से आजकल 13 स्थान ही भरे हुए हैं। इस संख्या में 1 आर.एम.पी. (निदेशक), 5 विज्ञानिक, 2 तकनीकी कर्मचारी और 5 प्रशासनिक कर्मचारी अपने पदों पर कार्यरत हैं।

## किसानों से प्राप्त प्रतिक्रियाएँ

- किसानों की फसलों और पशुधन प्रौद्योगिकियों पर दी गई प्रतिक्रियाओं को कृषि विज्ञान केन्द्रों द्वारा आकलन करने पर इस बात के संकेत मिले प्रजातियां/संकरों, सस्य विज्ञानिक पद्यतियां जिनमें अन्तर फसलीकरण, पोषक तत्व प्रबंधन, कीट एवं रोग प्रबंधन पद्यतियां और फार्म उपकरणों के अपनाने से किसानों को उनकी खेती करने वाली पद्यतियों के मुकाबले उच्च उत्पादन और अधिक आय प्राप्त हुए। वहीं पशुधन में खनिज पूरकता से गर्भाधारण दर में वृद्धि देखी गई।



On Farm Sale of Watermelon Facilitated during COVID-19 (KVK, Udipi)

## Executive Summary

The ICAR-Krishi Vigyan Kendras (KVKs) are nationwide network for undertaking frontline extension by Indian Council of Agricultural Research (ICAR), New Delhi. Agricultural Extension Division at the national level and ICAR-Agricultural Technology Application Research Institutes (ATARI) at Zonal level monitor and coordinate the activities of KVKs under the overall guidance and support of Deputy Director General, (Agricultural Extension), ICAR, New Delhi. The ICAR-ATARI, Bengaluru, Zone XI has established 48 KVKs of which 33 in Karnataka, 14 in Kerala and one in Lakshadweep under the administrative control of SAUs (33 KVKs), NGOs (8 KVKs) and ICAR Institutes (7 KVKs).

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, extension activities and farm advisories, production and supply of technological products there by serving as the knowledge and resource centre on scientific farming at the district level.

### Major Activities at ICAR-ATARI Bengaluru

- Shri Kailash Choudhary, Hon'ble Union Minister of State for Agriculture & Farmers' Welfare inaugurated the "Virtual Annual Zonal Review Workshop of KVKs of Zone XI comprising of Karnataka, Kerala and Lakshadweep" organized by ICAR-ATARI, Bengaluru on 14 July, 2020.
- ICAR-ATARI, Bengaluru organized First Institute Research Council (IRC) meeting during 2-3 September, 2020. Ten research projects, four ongoing and six new research project proposals were taken up for discussion. Two inter-institutional projects viz. Impact assessment of technological interventions and sugarcane pedicels in collaboration with ICAR-IIHR, Bengaluru and ICAR-SBI, Coimbatore, respectively were also discussed.
- ICAR ATARI, Bengaluru along with Farmer FIRST Centers of ICAR-CPCRI, ICAR-NIANP, ICAR-IIHR and ICAR-CIFT organized digital discourse series on 'Gender and Pandemic: Challenges and Opportunities' during 10-12 August, 2020 with 160 participants across the country.
- ICAR-ATARI, Bengaluru organized a wide

spectrum of programmes during the year viz., Annual review (2019) cum action plan workshops (2020-21) of KVKs in different phases, Inauguration of administrative building of ICAR-KVK Uttara Kannada, Rajbhasha Saptaha, Research Advisory Council (RAC), 150<sup>th</sup> Birth Anniversary of Mahatma Gandhi, Vigilance awareness week, Institute foundation day, Swachhta Pakhwada and Participation of KVK farmers in live telecast of Hon'ble Prime Minister programme.

### Major Achievements of KVKs

#### Technology Assessment

- A total of 258 on farm tests (OFTs) were conducted during the year which included 215 under crops, 33 under livestock and 10 under home science enterprises. Altogether, 572 technologies were assessed of which 497 under crops, 60 under livestock and 15 under home science enterprises. These activities were carried out by involving 1201 farmers of which 947 farmers under crops, 145 farmers under livestock and 109 farmers under Home Science enterprises.
- Under crop category, 215 OFTs implemented, which included 150 OFTs in Karnataka and 65 in Kerala. Out of 497 technological options that were tested / assessed, 344 were in Karnataka and 153 in Kerala. Karnataka KVKs laid out trials in 628 farmers fields whereas Kerala KVKs laid out trials in 319 farmers fields, making a total of 947.
- Under livestock category, KVKs conducted 33 OFTs, including 16 in Karnataka and 17 in Kerala. This was done by laying out trials in 145 farmers fields of which 78 farmers fields in Karnataka and 67 farmers fields in Kerala. In the process, KVKs assessed 60 technological options of which 33 in Karnataka and 27 in Kerala.
- Home Science enterprises were reported from four KVKs in Karnataka and three KVKs in Kerala wherein KVKs conducted 10 OFTs.

#### Frontline Demonstrations

- A total of 6337 frontline demonstrations (FLDs) were conducted including 1096 on cereals and millets, 20 on oilseeds, 465 on pulses, 130 on commercial crops, 71 on fibre crops, 225 on fodder crops, 10 on green manure crops, 472 on vegetable crops, 61 on tuber crops, 243 on fruit crops, 40 on flower crops, 75 on plantation crops, 195 on spices,

- 10 on medicinal crops, 421 on hybrids of various crops, besides it includes 154 demonstrations on agricultural farm implements, 786 demonstrations on livestock and fisheries and 1682 demonstrations on enterprises in Karnataka, Kerala and Lakshadweep.
- In paddy, demonstrated technologies such as ICM, INM, IPDM, IDM, IPM, reclamation of problematic soils, resource conservation technologies and improved varieties viz., GNV-10-89, RNE-1504, Gangavathi sona, Shyadripanchamuki, salt tolerant variety GGV-05-01 and water management technologies gave an overall increase in grain yield of 14.27 per cent over their respective checks in Karnataka. Similarly, in Kerala, ICM, INM, IPDM, organic cultivation and varieties such as Shreyas, VTL-10 and Manuratna gave on an average 52.52 q/ha yield whereas check yielded 41.10 q/ha.
  - In wheat, an average of 31.72 q/ha grain yield was recorded due to ICM, varieties UAS-304 and DDK-1029 as compared to 27.98 q/ha under check. Demonstrations on IDM and IPDM in maize gave higher yield of 68.00 q/ha and 59.88 q/ha respectively in comparison to check (61.00 q/ha and 51.85 q/ha respectively) in Karnataka.
  - In Karnataka, improved varieties SPV-2217 and GS-23 and fall armyworm management technologies in rabi jowar gave an average yield of 13.45 q/ha over their checks (11.60 q/ha). Varietal demonstration in finger millet with KMR-360 gave an average yield of 30.47 q/ha as compared to 24.12 q/ha in check. Intercropping of foxtail millet in pigeonpea (1:2) gave higher net returns of ₹. 61780/ha as compared to check (₹.14550/ha).
  - KVKs of Karnataka conducted 95 demonstrations in groundnut, 12 in sunflower, five in safflower, five in linseed, 22 in sesamum and 62 in soybean under oilseeds in 77.00 ha. Groundnut performed better under ICM, IPDM, INM and improved varieties by recording an increased average yield of 21.33q/ha as compared to farmers practice (17.71q/ha). Sesame under ICM and IDM, linseed variety NL-115 and sunflower under ICM recorded higher yield and net returns. Demonstration of soybean variety DSB-23, IPDM and INM resulted in higher yield of 15.41q/ha over farmers practice (13.04 q/ha).
  - KVKs of Karnataka conducted 242 demonstrations in pigeonpea, 47 in greengram, 22 in blackgram, 21 in horsegram, 10 in lab lab (avere), five in rice bean and 118 in chickpea under pulses in 170.20 ha. Among the technologies demonstrated, intercropping of pigeonpea with maize has recorded highest yield of 22.34 q/ha, which was followed by 15.65 q/ha under improved variety GRG-152. In greengram, improved variety BGS-9 gave highest yield of 8.00 q/ha as compared to 6.47 q/ha in check. In blackgram, overall yield increase was 65.63 per cent over check due to ICM and variety LBG-791.
  - During rabi season, varietal demonstration on ICM and IPDM in chickpea gave an average increase of 19.31 per cent in yield over their checks. Introduction of rice bean variety KBR-1 gave higher yield of 15.40 q/ha with net profit of ₹. 41000/ha in Karnataka.
  - A total of 130 demonstrations were organized on major commercial crops such as mulberry and sugarcane in 54.00 ha by KVKs of Karnataka. In sugarcane, demonstrated technologies like ICM, IPM and soil fertility management in the farmers' field have recorded an average yield of 1083.08q/ha as compared to 935.81 q/ha cane yield under check.
  - Seed cotton yield was 20.05 q/ha and 22.49 q/ha respectively, in IPDM and intercropping demonstrations in Karnataka.
  - A total of 220 demonstrations were conducted on fodder crops in 59.00 ha by KVKs of Karnataka. Technologies like ICM, cultivation of improved varieties of fodder sorghum such as CoFS-29 and COFS-31, besides stylo grass, hedge lucern and fodder trees as fodder gave green fodder yield of 1364.65 t/ha with net profit of ₹. 108055/ha.
  - 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 and vegetable cowpea were demonstrated with improved technologies on 472 farmers' fields in 134.30 ha by KVKs of Karnataka, Kerala and Lakshadweep.
  - A total of 61 demonstrations were conducted on major tuber crops like potato, cassava, sweet potato

and lesser yam in 7.67 ha by KVKs of Zone-XI. In Cassava, demonstrations on INM, ICM and IPM technologies resulted in higher average yield of 280.33 q/ha and net returns of ₹. 336075/ha as compared 205.00 q/ha and net returns of ₹. 191464/ha in check in Kerala.

- A total of 240 demonstrations on major fruit crops like banana, grapes, lime, mango, papaya, pomegranate, coorg mandarin, straw berry and guava were conducted by KVKs of Zone XI in 72.94 ha. Among the technologies demonstrated in banana, IDM technology in G-9 registered a highest yield of 747.50 q/ha followed by 362.20q/ha in *yelakki* with higher economic benefits as compared to their checks. In grapes, disease management technology demonstration gave 374.50 q/ha yield as compared to check with 339.00 q/ha. In Kerala, straw berry demonstration gave 300.00q/ha fruit yield.
- In plantation crops, 75 demonstrations were undertaken by KVKs of Zone XI on major plantations like arecanut, coconut and coffee in 23.94 ha. The important plantation crop of Kerala i.e coconut was demonstrated under technologies such as INM, IDM and drought management gave an average yield of 13235 nuts/ha/year over check (8987 nuts/ha/year).
- In spices, 86 demonstrations were conducted in black pepper, garlic, ginger, turmeric, betelvine, chilli and coriander in 21.42 ha in Karnataka and 109 demonstrations were implemented in black pepper, ginger and turmeric crops by KVKs of Kerala in 3.67 ha.
- In flower crops, demonstrations were conducted in chrysanthemum, rose, tuberose and Udupi mallige in 6.60 ha by KVKs of Karnataka. Demonstration of ICM technology in chrysanthemum recorded higher flower yield of 57.50 q/ha as compared to 48.80 q/ha in check.
- A total of 421 demonstrations on hybrids in various crops like maize, tomato, sunflower, Bt. Cotton, bhendi, brinjal, bitter gourd, ridge gourd, cabbage, chilli, frenchbean, pole bean, papaya and watermelon were conducted by KVKs of Karnataka in 125.90 ha.

- Under farm mechanization, demonstrations were conducted on drum seeder and paddy straw baler in paddy, seed cum fertilizer drill, cycle weeder, harvester and winnower in ragi, mechanized harvester in sugarcane, solar nipping machine in pigeonpea, cotton shedder and safe storage equipment by KVKs of Karnataka; and use of drone for fertilizer/pesticide spray and bunch covering device in banana by KVKs of Kerala.
- A total of 1248 demonstration units were established on farm enterprises such as apiculture, nutrition garden, fisheries, fish waste compost, coir pith compost, mushroom, nursery, poultry, sericulture, storage, value addition, and others benefiting 1682 farmers/farm women in Karnataka, Kerala and Lakshadweep.
- A total of 663 demonstration units in livestock including poultry and 101 demonstration units in fisheries were established benefiting 675 farmers/farm women by KVKs of Karnataka and Kerala.
- KVKs of Karnataka have implemented 1616 programmes for empowerment of farm women by involving 34904 participants. A total of 196 programmes on health and nutrition and other children related aspects were also implemented by involving 2014 children. Similarly, KVKs of Kerala have implemented 969 programmes for empowerment of farm women covering 33380 participants and 36 programmes on health and nutrition and other children related aspects covering 8069 children.

### Capacity Development

- KVKs organized 4185 capacity development courses which includes 3544 courses for farmers/farmwomen, 440 courses for rural youth and 201 courses for extension personnel. Through these courses, 273990 persons were trained comprising of 249250 farmers/farmwomen, 16265 rural youth and 8475 extension personnel. In addition, 521 sponsored and 112 vocational courses were organized where in trained 19039 and 9379 participants, respectively.
- For farmers and farmwomen, the major area of capacity development was crop production in which 758 courses were conducted involving

57650 farmers/farm women. Capacity development courses on plant protection (526) and home science/women empowerment (492) were the next most demanded courses followed by livestock production and management (381 courses).

- For rural youth, topics like INM, IPDM, organic farming and nutri-garden (115 courses, 3211 participants) and value addition (49 courses, 1460 participants) were major training areas.
- For extension functionaries, topics like value addition, soil fertility, IFS, precision farming and processing etc. were major training areas with 46 courses and 1882 participants followed by women and child care (29 courses, 1479 participants).
- Large number of sponsored courses (96) were organized on increasing production and productivity of crops with the participation of 4593 farmers/rural youth/extension functionaries followed by topics like INM, beekeeping, mushroom cultivation with 93 programmes and 2147 participants.
- Vocational development courses were mostly organized on sheep and goat rearing with 13 courses and 452 participants followed by dairy farming with 11 courses and 308 participants.

### **Frontline Extension Programmes**

- KVKs carried out a total of 1.11 lakh frontline extension activities and created awareness among 12.08 lakh farmers (10.78 lakh general farmers and 1.31 lakh SC/STfarmers) and 0.37 lakh extension personnel on varieties, production technologies, integrated pest and disease management, animal health and nutrition, poultry production, fisheries management and human nutrition.
- KVKs published extension literature (406), popular articles (40) and research papers/abstracts (260), besides newspaper coverage (2,090), radio coverage/talks (509), T V coverage/ talks (229) and development of CDs/DVDs (28).

### **Production of Technological Inputs**

- Produced and supplied 2672.69 q of seeds of different crop varieties, 29.15 lakh planting material of different crops and hybrids, 3.08 lakh livestock strains and fish fingerlings benefiting 2.03 lakh farmers.

- Produced and supplied 4061.22 q of bio-products through which 1.14 lakh farmers were motivated to adopt bio-control by reducing use of chemicals.

### **Kisan Mobile Advisory Services**

- Thirty-nine KVKs of the zone sent 8588 text messages to 18.13 lakh farmers. The messages were related to crops (3961), weather (2440), other enterprises(1051), livestock (927), awareness (335) and marketing (144).

### **Soil, Water and Plant Analysis**

- KVKs analysed 30167 samples of soil, water, plant and organic manure received from 25277 farmers belonging to 11906 villages based on which 27998 soil health cards were distributed to farmers.

### **World Soil Day Celebration**

- The World Soil Day was celebrated on 5 December, 2020 at 43 KVKs of the zone with the participation of 4620 farmers, wherein 2165 soil health cards were distributed. On the occasion, ministers, MPs, MLAs, 69 other public representatives and 287 officials were participated. Celebration of world soil day was given wide publicity through 168 media coverages.

### **Rainwater Harvesting Units**

- Rainwater harvesting and recycling units established in 16 KVKs were utilized to organize 50 capacity development courses and 51 demonstrations. Facility was used to produce 332682 planting materials for use in KVKs and to provide to farmers. These units were visited by 21465 farmers and 253 officials and got acquainted with the rainwater harvesting techniques.

### **Convergence and Linkages of KVKs**

- As part of convergence with ATMA, KVKs participated in 845 programmes organized by ATMA and at the same time KVKs organized 413 programmes in collaboration with ATMA.
- 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 KVKs to organize various programmes and activities.

### **Success Stories and Cases of Large-Scale Adoptions**

- KVKs have documented many success stories based on the performance of technologies in terms

of enhancing productivity and augmenting income of farmers. Some of them are presented below:

### Karnataka

- The Hallisri SHG group at Thovinakere of Koratagere Taluk has established home scale processing and value addition of finger millet (KVK, Tumakuru-II)
- Value addition of millets added additional income to Shri Siddanagowda (KVK, Koppal)
- Shri Basavaraj Hulikatti- A medical representative turned as a dairy farmer (KVK, Haveri)
- Direct marketing during covid lockdown became successful enterprise (KVK, Chikkaballapura)
- IFS - Escalates income of Shri Durgappa Angadi (KVK, Shivamogga)
- Value addition in fig made successful during COVID-19 (KVK, Ballari)
- Dsb-21 - A new soybean variety disseminated in 650 ha (KVK, Belagavi-II)
- Indian broad bean as a relay crop in bitter gourd with staking (KVK, Raichur)

### Kerala

- Castor oil based bio repellent- Ecodon against wild boars (KVK, Thiruvananthapuram)
- Farmer participatory pearl spot seed production and supply (KVK, Ernakulam)
- Yard long bean with raised bed and plastic mulching (KVK, Pathanamthitta)
- Indoor plants gave sustainable livelihood for a family (KVK, Kollam)

### **Awards and Recognition**

- The ICAR Jagjivan Ram Abhinav Kisan Puraskar, 2019 from Zone XI was awarded to Shri. S.C. Thimmaiah, an innovative farmer from Nallur village of Kodagu district in Karnataka and Shri. T. Purushothaman, an innovative farmer from Kerala.
- KVK, Bagalakote received the Zonal Best KVK "Pandit Deen Dayal Upadhyay Krishi Vigyan Rashtriya Protsahan Puraskar 2019 for Zone XI.

### **Special Programmes**

- Under cluster frontline demonstrations on pulses, a total of 2350 demonstrations on different pulse crops viz., blackgram, greengram, pigeonpea, chickpea and cowpea were conducted by KVKs of Karnataka and Kerala in an area of 940 ha of farmers' field.
- Under cluster frontline demonstrations on oilseeds, a total of 1950 demonstrations on groundnut, soybean, sunflower, safflower, niger, castor, linseed, mustard and sesame were conducted by KVKs of Karnataka and Kerala in 780 ha of farmers' field.
- Produced 3047.25 q seeds of pulses by eight seed hub KVKs, which included chickpea (1646.00 q), pigeonpea (735.70 q), blackgram (621.90 q), greengram (26.55 q), cowpea (13.80 q) and horsegram (3.30 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 Alappuzha (water inundation/ drainage) in Kerala.
- A total of 1122 demonstrations were implemented on NRM activities covering 1150.28 ha area in order to build climate resilience in cluster of villages covering seven drought prone districts.
- A total of 1489 demonstrations covering 563.13 ha area spread over in seven NICRA districts were implemented under crop production module.
- Climate resilient varieties suiting to drought prone districts emerged under NICRA demonstrations such as blackgram (DBGV-5), finger-millet (ML-365), foxtail millet (DHft-109-3), perennial fodder crop (CoFS-29 and 31) and pigeonpea (TS-3R, BRG-1 and 2 and BRG-5) have been up scaled in 263351.40 ha area through state department of agriculture in Belagavi, Chikkaballapura, Davanagere, Gadag, Kalaburgi and Tumakuru districts of Karnataka.

### **Technological Backstopping by Directorate of Extension**

- Directorate of Extension and their officials monitored and extended technical backstopping to

KVKs under SAUs, NGOs and ICAR institutes. Directorate of Extension participated in 40 Scientific Advisory Committee meetings, 62 field days, 52 workshops/seminars, six technology weeks and 99 training programmes. Field level monitoring was done by visiting 43 on farm trials and 93 plots of frontline demonstrations conducted by KVKs.

### Research Projects

- Institute research projects viz., Analysis of skill development training conducted by KVKs for the aspirations of participants and constraints faced by trainees and trainers, Effectiveness of dairy production interventions under Farmer FIRST project and Study on agri based entrepreneurship development among youth as well as one Externally funded research project – Network project on New Extension Methodologies and Approaches (NEMA) were carried out by the Scientists of ICAR-ATARI, Bengaluru during the reporting period.

### Publications

- Scientists of ICAR ATARI Bengaluru published research papers (3), presented papers at national/international conferences (1), edited books/chapters (7) and reports (1). KVK staff of Karnataka published 234 research papers/abstracts, 121 technical reports, 162 technical bulletins, 312 popular articles and 305 extension literature, KVK staff of Kerala published 26 research papers/abstracts, 16 technical reports, eight technical bulletins, 91 popular articles and 101 extension literature and KVK staff of Lakshadweep published three popular articles on various technological aspects of agriculture and its allied enterprise.

### Workshops, Meetings, Conferences and Human Resources Development

- Director/scientists/officers of the institute conducted/participated in 151 meetings/workshops/ conferences/ seminars/ training programmes.
- Online summer training programme was organized for Programme Assistants (computer) on Full Stack Web Development with the support of Ministry of Electronics & Information Technology, Government of India during 1-14 October, 2020 wherein 30 Programme Assistants (Computer) from KVKs of Zone-XI and Chief Technical

Officer (Computer) from ICAR-ATARI, Zone XI, Bengaluru were participated.

### Personnel

- Total sanctioned staff strength of ICAR-ATARI, Bengaluru is 18. Out of which 13 are currently filled viz. one RMP (Director), five scientists, two technical staff and five administrative staff.

### Farmers Feedback

- Farmers feedback on technologies of crops and livestock assessed by KVKs indicated that varieties/hybrids, agronomic practices including inter crops, nutrient management, pest and disease management practices and farm implements gave higher yield and income as compared to farmers practices. Further, mineral supplementation in livestock helped to increase conception rate.



## Chapter - 1

# About ICAR - Agricultural Technology Application Research Institute (ATARI)

The office of ICAR-ATARI is located at 0.5 kms away from western side of Hebbal flyover, 3 kms from Mekhri circle, 12 kms from railway station (Bengaluru Central), 6 kms from railway station (Yashwanthpur), 12 kms from majestic bus stand and 25 kms from international airport, Bengaluru. The institute has established 48 KVKs of which 33 KVKs in Karnataka, 14 KVKs in Kerala and one KVK in Lakshadweep through different host organizations such as SAUs, ICAR institutes and NGOs.

This chapter consists of following heads :

- 1.1 Mandate of ICAR-ATARI
- 1.2 ICAR-ATARI, Zone XI, Bengaluru
- 1.3 Budget



## 1. About ICAR Agricultural Technology Application Research Institute

The Agricultural Extension Division under 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. These KVKs are hosted by ICAR institutes, State Agriculture Universities (SAUs), State Government Agriculture Departments and Non-Government Organizations (NGOs) with the financial support of Government of India. The Agricultural Extension Division headed by 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.

### 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

The ICAR established eight Zonal Coordinating Units (ZCUs) in 1979 to monitor and coordinate Lab to Land Programme (LLP) launched on the occasion of ICAR's Golden Jubilee. 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 and added 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 in 1986. 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. With the creation of three new zones and the reorganization of zones, ATARI, Bengaluru became Zone XI w.e.f. April, 2017 covering Karnataka, Kerala and Lakshadweep.

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

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

## 1.2.2 Staff

Total sanctioned staff strength of ICAR-ATARI, Zone XI, Bengaluru is 18, out of which 13 are currently filled (Table 2).

**Table 2: Staff strength of ICAR-ATARI, Zone XI, Bengaluru as on 31.12.2020**

Category	Sanctioned (No.)	Filled (No.)
Director (RMP)	1	1
Scientific	6	5
Technical	2	2
Administrative	8	5
SSS (Gr-II)	1	0
<b>Total</b>	<b>18</b>	<b>13</b>

## 1.2.3 Organizational structure

The organogram of ICAR-ATARI, Zone XI and KVKs functioning under this institute is depicted in Fig. 1.

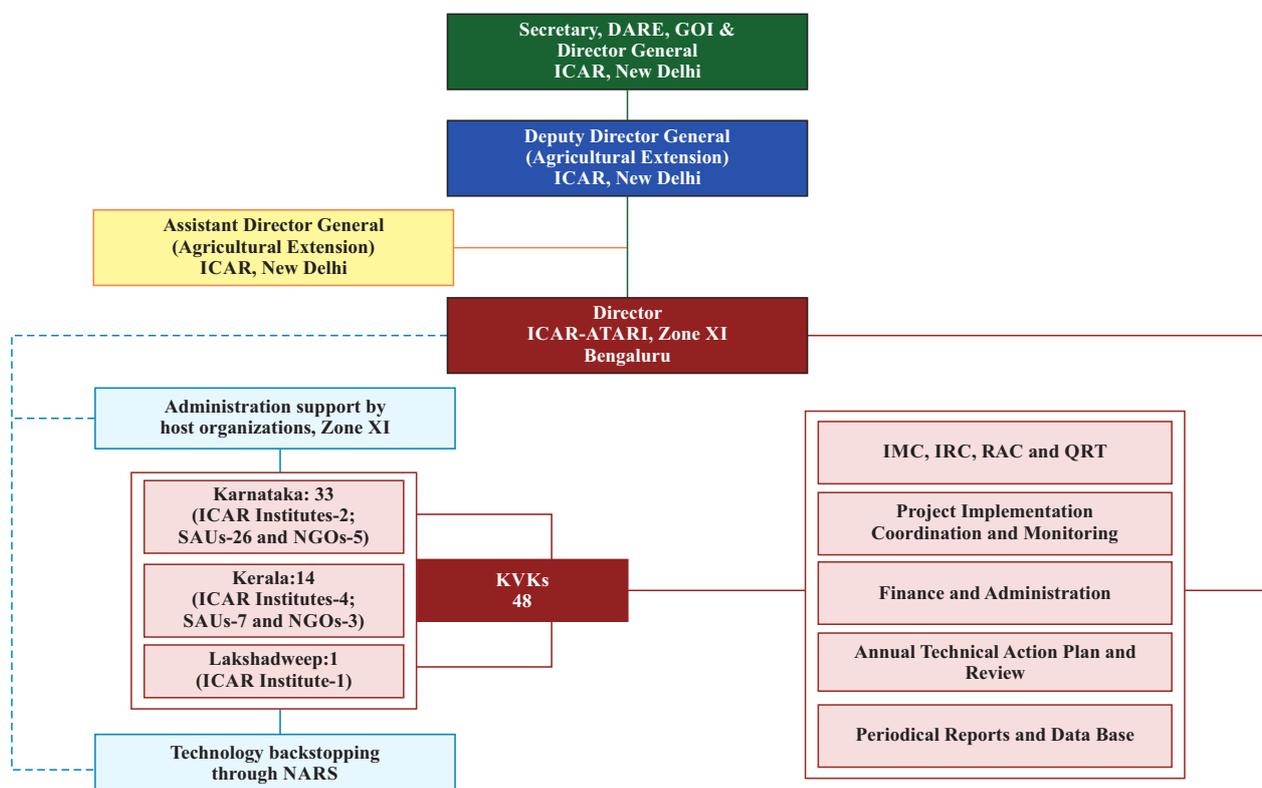
## 1.2.4 Major activities

### 1.2.4.1 Annual review cum action plan workshops of KVKs

**(a) Karnataka:** Due to COVID 19 pandemic, the annual review cum action plan workshop of KVKs of Karnataka was conducted in four phases in both physical and virtual form. Details are given below:

**Phase-I:** Two days physical workshop was organised for the KVKs under the jurisdiction of Director of Extension, UAS, Bengaluru during 20-21 May, 2020 at GKVK Campus, UAS, Bengaluru. During the workshop, the progress of 10 KVKs viz., Bengaluru Rural, Chamarajanagara, Chikkaballapura, Hassan, Kolar, Mandya, Mysuru, Ramanagara, Tumakuru-I and Tumakuru-II for the year 2019 was reviewed on 20 May, 2020 in the presence of experts from UAS, Bengaluru, ICAR Institutes in Karnataka and ICAR-ATARI, Bengaluru. Action plan for the year 2020-21 of these KVKs was discussed through presentation by individual KVKs before the experts committee on 21 May, 2020 and finalized each KVK technical programme for the year 2020-21. Dr. M.Byregowda, Director of Extension, UAS, Bengaluru, Dr.M.J.Chandre Gowda, Director (Acting), ICAR-ATARI, Bengaluru, besides Dr. D.V.S. Reddy, Principal Scientist, ATARI coordinated the workshop.

**Phase-II:** Two days virtual workshop was organised for the KVKs under the jurisdiction of Director of Extension, UAS, Dharwad during 27-28 May, 2020 with workshop link hosted by ICAR-ATARI, Bengaluru. During the workshop, the progress of nine KVKs viz., Bagalakote, Belagavi-I, Belagavi-II, Dharwad, Gadag, Haveri, Uttara Kannada, Vijayapura-I and Vijayapura-II for the year 2019 was reviewed on 27 May, 2020 through experts from UAS, Dharwad, ICAR institutes in



**Fig 1: Organogram of ICAR-ATARI, Zone XI, Bengaluru**

Karnataka and ICAR-ATARI, Bengaluru. Action plan for the year 2020-21 of these KVKs were discussed through presentation of individual KVKs before the experts committee on 28 May, 2020 and finalized each KVK technical programme for the year 2020-21. Dr. Ramesh Babu, Director of Extension, UAS, Dharwad and Dr. B.T.Rayudu, Principal Scientist, ICAR-ATARI, Bengaluru coordinated the workshop.

**Phase-III:** One day virtual workshop was organised for the KVKs under the jurisdiction of Director of Extension, UAHS, Shivamogga on 30 May, 2020 with workshop link hosted by ICAR-ATARI, Bengaluru. During the workshop, the progress of seven KVKs viz., Chikkamagaluru, Chitradurga, Davanagere, Dakshina Kannada, Kodagu, Shivamogga and Udupi for the year 2019 was reviewed on 30 May, 2020 by the experts from UAHS, Shivamogga, ICAR Institutes in Karnataka and ICAR-ATARI, Bengaluru. Further, action plan workshop for these KVKs for the year 2020-21 was organised on 3 June, 2020. Action plan was discussed through presentation of individual KVK before the experts committee and finalized each KVK technical programme for the year 2020-21. Dr. K.C. Shashidhar, Director of Extension, UAHS, Shivamogga and Dr. Thimmappa K, Senior Scientist, ICAR-ATARI, Bengaluru coordinated the workshops.

**Phase-IV:** Two days virtual workshop was organised for the KVKs under the jurisdiction of Director of Extension, UAS, Raichur during 1-2 June, 2020 with workshop link hosted by ICAR-ATARI, Bengaluru. During the workshop, the progress of seven KVKs viz., Ballari, Bidar, Kalaburagi-I, Kalaburagi-II, Koppal, Raichur and Yadgir for the year 2019 was reviewed on 1 June, 2020 through experts from UAS, Raichur, ICAR Institutes in Karnataka and ICAR-ATARI, Bengaluru. Action plan for the year 2020-21 of these KVKs was discussed through presentation of individual KVK before the experts committee on 2 June, 2020 and finalized each KVK technical programme for the year 2020-21. Dr. B.M.Chittapur, Director of Extension, UAS, Raichur and Dr. B.T.Rayudu, Principal Scientist, ICAR-ATARI, Bengaluru coordinated the workshop.

**(b) Kerala and Lakshadweep:** Due to COVID 19 pandemic, the annual review cum action plan workshop of KVKs of Kerala was conducted in two phases. Details are given below:

**Phase-I:** Five days virtual workshop was organised for the KVKs under the jurisdiction of Director of Extension, KAU, Thrissur during 14-18 May, 2020 with workshop link hosted by DE, KAU. During the workshop, action plan of 15 KVKs viz., Alappuzha, Ernakulam, Idukki, Kannur, Kasaragod, Kollam, Kottayam, Kozhikode, Mallapuram, Palakkad, Pathanamthitta, Thiruvananthapuram, Thrissur, Wayanad and Lakshadweep was discussed through presentation of individual KVK before the experts committee and finalized each KVK technical programme for the year 2020-21.

**Phase –II:** Two days virtual annual review workshop was organised for KVKs of Kerala and Lakshadweep for the year 2019 during 14-15 July, 2020. Progress of these KVKs was reviewed during the workshop through experts from KAU, Thrissur, ICAR Institutes in Kerala and ICAR-ATARI, Bengaluru. Dr. Jiju P. Alex, Director of Extension, KAU, Thrissur and Dr. D.V.S. Reddy, Principal Scientist, ICAR-ATARI, Bengaluru coordinated the workshop.

#### 1.2.4.2 Virtual annual zonal review workshop of KVKs

Shri Kailash Choudhary, Hon'ble Union Minister of State for Agriculture & Farmers' Welfare inaugurated the "Virtual Annual Zonal Review Workshop of KVKs of Zone - XI comprising of Karnataka, Kerala and Lakshadweep" organized by ICAR-ATARI, Bengaluru on 14 July, 2020. Hon'ble Union Minister of State urged KVKs, ICAR Institutes and State Agricultural Universities to constantly examine farmers problems and continuously engage with farming community in generating and advocating proper solutions to their problems. He also suggested KVKs to bring awareness among farmers about Government's schemes and programmes for the wider benefit of farmers.



Shri Kailash Choudhary, Hon'ble Union Minister of State for Agriculture & Farmers Welfare inaugurated the Virtual Annual Zonal Review Workshop of KVKs of Zone XI

Dr. Trilochan Mohapatra, Secretary (DARE) & Director General (ICAR) complimented ICAR-ATARI, Bengaluru and KVKs in Zone XI for carrying out good number of activities benefitting the farmers. He also appreciated the activities carried out in convergence with the Agricultural Universities, ICAR Institutes and State Development Departments.

Dr. Ashok Kumar Singh, Deputy Director General (Agricultural Extension), ICAR emphasized the importance of promoting concepts and models of climate resilient villages in all KVK Districts. Dr. R. Chandra Babu, Vice-Chancellor, Kerala Agricultural University, Thrissur appreciated the KVKs role in empowering farmers and farm women through technology application and demonstrations. Dr. M.B. Chetti, Vice-Chancellor, University of Agricultural Sciences, Dharwad highlighted the salient achievements of KVKs in Karnataka. KVK's achievements in Zone-XI

was briefed by Dr. M.J. Chandre Gowda, Director (Acting), ICAR-ATARI, Bengaluru. Dr. Randhir Singh, ADG (Agricultural Extension), ICAR along with the senior officials of ICAR Institutes, KVKs and SAUs participated in workshop.



Dr. Trilochan Mohapatra, Secretary (DARE) & Director General (ICAR) graced the occasion



Dr. Ashok Kumar Singh, Deputy Director General (Agricultural Extension), ICAR addressed the KVKs

#### 1.2.4.3 Digital discourse series on gender and pandemic

ICAR ATARI, Bengaluru, along with Farmer FIRST Centers (FFC) viz. ICAR-CPCRI, ICAR-NIANP, ICAR-IIHR and ICAR-CIFT organized digital discourse series on 'Gender and Pandemic: Challenges and Opportunities' during 10-12 August, 2020 with 160 participants across the country. Dr. Ashok Kumar Singh, Deputy Director General (Agricultural Extension), ICAR in his keynote address highlighted the productive performances of agriculture during this pandemic period indicating the resilience of farming community and technologies. He also encouraged the FFCs to promote Farmers Producer Organizations (FPOs) for empowerment of farmers.

Ten eminent scientists and policy makers in the country addressed the issues related to gender sensitization of technology development and transfer, vulnerability of farm women during pandemic period, consequences of reverse migration on income and nutrition, livelihood skill up-gradation, emotional and psychological stress and its effect on women, ICTs for empowering farm

women, gender perspectives in Natural Resource Management, policy framework for strengthening farm women during and beyond pandemic, and institutional mechanisms for supporting women in crisis management issues.



Keynote address by Dr. Ashok Kumar Singh, Deputy Director General (Agricultural Extension), ICAR

Dr. M.J. Chandre Gowda, Principal Scientist (AE), ICAR-ATARI, Bengaluru delivered a talk on vulnerability of farm women in pandemic era.

Dr. V. Venkatasubramanian, Director, ICAR-ATARI, Bengaluru briefed about the challenges faced by farm women during COVID-19 and emphasized on maintenance of proper health and emotional stability of farm women and empowerment through technology accessibility, market support, partnership, linkage and policy issues. Dr. D.V. Kolekar, Scientist from ICAR-ATARI, Bengaluru coordinated the programme.

#### 1.2.4.4 Inauguration of Administrative building of ICAR-KVK Uttara Kannada

Administrative building of ICAR-KVK, Uttara Kannada at Sirsi was inaugurated on 17 August, 2020 by Shri. B.C.Patil, Hon'ble Agriculture Minister, Government of Karnataka. In his inaugural address, emphasised the capacity development of rural youth by KVKs and appreciated the role of ICAR and KVKs in supporting farmers and rural youth during difficult COVID 19 situation. Dr. Trilochan Mohapatra, Secretary (DARE) and Director General (ICAR) expressed that the network of 721 KVKs spread all over the country are doing extremely good work in terms of reaching farmers and dissemination of new technologies through mandated activities. Shri. Shivaram Hebbar, Hon'ble Minister of Labour, Government of Karnataka stressed the importance of creating awareness on scientific agricultural practices among farming community.

Dr. Ashok Kumar Singh, Deputy Director General (Agricultural Extension), ICAR emphasised on role of KVKs in agriculture development and motivated them for fulfilling the huge expectations raised at different levels. Shri. Vishweshwar Hegde Kageri, Hon'ble Speaker, Government of Karnataka in his presidential

remarks appreciated the close association of KVK, Uttara Kannada with farmers in addressing their problems. Shri. Suresh S Gonasagi, Shri. Shashimouli Kulkarni, Shrai. Y.N. Patil, Members, Board of Management, UAS, Dharwad and Shri. Shataram Siddhi, MLC graced the occasion. Exhibition highlighting appropriate technologies and live specimen of major crops of the district was arranged on the occasion. Dr. Mahadev B. Chetti, Vice Chancellor, UAS, Dharwad gave welcome and Dr.V.Venkatasubramanian, Director, ICAR-ATARI, Zone XI, Bengaluru delivered vote of thanks.



Shri. B.C.Patil, Hon'ble Agriculture Minister, Government of Karnataka inaugurated administrative building of ICAR-KVK, Uttara Kannada at Sirsi on 17 August, 2020



#### 1.2.4.5 Institute Research Council (IRC)

ICAR-ATARI, Bengaluru organized First Institute Research Council (IRC) meeting during 2-3 September, 2020. Dr. Randhir Singh, Assistant Director General (Agricultural Extension), ICAR in his virtual inaugural address urged the participants to keep balance between KVK coordination efforts and research activities. He highlighted the need to have experts from different disciplines in IRC and also emphasized to give priority on inter institutional projects due to limited manpower in ATARI.

Ten research projects of which four ongoing and six new research project proposals were taken up for discussion. New proposals that broadly covered areas such as Integrated Farming System, Identification and capacity development of farm leaders, digitization of knowledge system management, Technological and capacity needs of dairy farming and extension personnel and coordination and monitoring were approved. Two inter-institutional projects viz. Impact assessment of technological interventions and *Sugarcanepedia* in collaboration with ICAR-IIHR Bengaluru and ICAR-SBI, Coimbatore respectively were also approved.

Invited experts namely, Dr. V. Veerabhadraiah, Former DE, UAS, Bengaluru, Dr. G. Eshwarappa, Former DE, UAS, Bengaluru and Dr. S. Prabhu Kumar, Former Director, ICAR-ATARI, Ludhiana virtually participated in the deliberations and guided the scientists for fine tuning of research projects keeping in view the mandate of ATARI.

Dr. V. Venkatasubramanian, Director, ICAR-ATARI, Bengaluru in his concluding remarks emphasized that the research proposals are related to mandate of ATARI and KVK activities so that findings of these projects will benefit in strengthening the KVKs performance. The two days IRC programme was coordinated by Dr. D.V.S. Reddy, Member Secretary, IRC.



Dr. V. Venkatasubramanian, Director, ICAR-ATARI, Bengaluru Chairing IRC

#### 1.2.4.6 Rajbhasha Saptaha

The ICAR-ATARI, Bengaluru organised 'Rajbhasha Saptaha' from 8-14 September, 2020. The programme was inaugurated by lighting the lamp and started with a poem recitation, oration on the importance of Hindi and a short video show on COVID 19 awareness and prevention. During the week, Institute organised various Hindi learning activities and competitions. Institute celebrated Hindi Day on 14 September, 2020, the concluding day of *Rajbhasha Saptaha*.

The programme Chairperson, Dr. M.J.Chandre Gowda, advised the staff members to use Hindi as much as possible every day in the office. Speaking on the occasion Mr. Malay Bisht, Administrative Officer, ICAR-NBAIR, Bengaluru as Chief Guest said that Hindi is an unbreakable part of Indian culture and it has been an effective and powerful medium of national unity and identity. Winners of various competitions were awarded with cash prizes and certificates. Dr. Thimmappa K, Nodal Officer, Official Language coordinated various programmes during the week wherein all staff members actively participated.



Winners of various competitions awarded with cash prizes and certificates

#### 1.2.4.7 Research Advisory Council (RAC)

The first Research Advisory Council (RAC) of the ICAR-ATARI, Bengaluru was held virtually on 1 October, 2020 under the Chairmanship of Dr. P.Das, Former Deputy Director General (Agricultural Extension), ICAR, New Delhi and Chairman RAC. Members of RAC Dr. K.M. Bujarbaruah, Former VC, AAU, Assam; Dr. R. Parshad, Former ADG (AE), ICAR; Dr. Pramod Kumar Joshi, Former Director-South Asia, IFPRI; Dr. Debi Prasad Ray, Former VC, OUAT, Bhubaneswar; and Dr. Randhir Singh, ADG (AE), DDG Nominee were present. Dr.V.Venkatasubramanian, Director, ICAR-ATARI, Bengaluru and all Scientists of ICAR-ATARI, Bengaluru participated in the meeting. Projects presented by the Director, ICAR-ATARI, Bengaluru were discussed and proceedings were recorded. Dr. M.J.Chandre Gowda, Member Secretary, RAC coordinated the meeting.

#### 1.2.4.8 150<sup>th</sup> Birth Anniversary of Mahatma Gandhi

The ICAR-ATARI, Zone XI, Bengaluru organized a wide spectrum of programmes from 26 September to 2 October, 2020 to commemorate the 150<sup>th</sup> Birth Anniversary of the Father of the Nation, Mahatma Gandhi. The week-long programmes included organization of *Swachhta* activities, talk on Mahatma's visit to Bengaluru, songs on Mahatma, prayer songs of

Mahatma Gandhi, short original video screening of Mahatma's speech on non-violence and cleanliness and information on biography of Mahatma.

On 2 October, 2020, celebrated the event by screening the best Quotes of Mahatma Gandhi and selected scenes from the film Gandhi. Participants were appraised with Gandhian values and *Sanathana Dharma* preaching of Mahatma. On this occasion, a CD containing "An Autobiography: The Story of My Experiments with Truth" by M.K. Gandhi was distributed to all the participants to acquaint and follow the Mahatma's message.



A view of swachatha activity by ATARI staff during 150<sup>th</sup> birth anniversary of Mahathma Gandhi

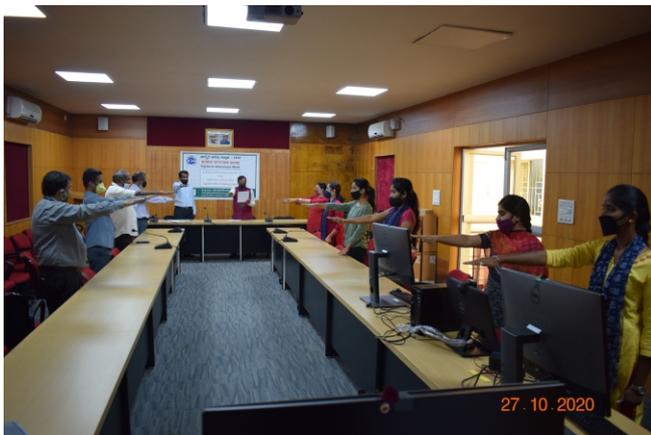
Dr. Venkatasubramanian, Director, ICAR-ATARI, Zone-XI, Bengaluru in his valedictory address urged the participants to follow the Gandhian ideals of truth and non-violence. He also appealed the staff to work selflessly in line with the Gandhian principles to make our agriculture a sustainable and profitable venture. Staff of ICAR-ATARI, Zone XI, Bengaluru actively participated in the week-long programmes which were coordinated by Dr. Thimmappa K, Principal Scientist.



Celebration of 150<sup>th</sup> birth anniversary of Mahathma Gandhi

### 1.2.4.9 Vigilance Awareness Week

Vigilance Awareness Week in consonance with the directions of the Central Vigilance Commission, was observed under the theme “Satark Bharat, Samriddh Bharat (Vigilant India, Prosperous India)” from 27 October to 2 November, 2020 with enthusiasm and active participation of all staff. By following the COVID-19 guidelines, the week began with administering of integrity pledge to all staff of ATARI by Dr. M.J. Chandre Gowda, Principal Scientist (Agril Extn) on 27 October 2020. The Week was concluded with the remarks on vigilance related issues on 2 November 2020 by Dr. V. Venkatasubramanian, Director, ATARI, Bengaluru. Dr. D.V.S. Reddy, Principal Scientist and Vigilance Officer of ATARI, Bengaluru coordinated the event.



Integrity pledge by staff of ATARI



Dr D. V. Srinivasa Reddy, Principal Scientist and Vigilance Officer briefed about vigilance awareness

### 1.2.4.10 Institute Foundation Day

Celebrated the Institute Foundation Day on 3 November, 2020. Dr. V. Venkatasubramanian, Director highlighted the achievements of ATARI, Bengaluru and its KVKs for upliftment of farming community in Zone-XI. Dr. S. Prabhu Kumar, Former Zonal Project Director, ICAR-ZPD, Bengaluru, Dr. M.R. Hegde, Former Zonal Coordinator, ICAR-ZCU, Hyderabad, Dr. K. P. Ramesha, Head, ICAR-NDRI, RS Bengaluru graced the event. On this occasion, staff and retired staff

of ICAR-ATARI, Bengaluru shared their experiences about the Institute's functioning, developments, achievements made over the decades. Ms. K. Roopakala, LDC and Shri. N. Vinod Kumar, LDC coordinated the event.



Inauguration of institute foundation day celebration



Release of ICAR-ATARI Newsletter (Volume-1/Issue-1)

### 1.2.4.11 Swachhta Pakhwada

ICAR-ATARI, Bengaluru observed Swachhta Pakhwada from 16 - 31 December, 2020. All staff of the Institute and KVKs in Zone XI actively involved in various activities during the period for the cause of Swachhta and organized a total of 2612 activities on various aspects such as basic maintenance for clean and green campus. The activities organized include housekeeping, cleaning of guest house, institute buildings & toilets, campus (170), sanitation (49), cleaning and beautification of surrounding areas (68), digitization of office records/ e-office (1316),

vermicomposting/ composting of biodegradable waste management and other activities on generation of wealth from waste (46), recycling of used water for agriculture/ horticulture purpose (24), swachhta awareness programmes at local level (64), swachhta workshops (13), participation in swachhta pledge (528), displaying of banner (151), competitions (19), campaign through involvement of print & electronic media (104), programmes by involvement of the farmers, farm women and village youth in their adopted villages (60) and yoga (6) with the participation of 16362 participants. Dr. D.V.Kolekar, Scientist coordinated the event.



KVK, Kalaburagi-II



ICAR-ATARI, Zone-XI, Bengaluru



KVK, Alappuzha



KVK, Chikkamagalur

#### 1.2.4.12 Participation of KVK farmers in live telecast of Hon'ble Prime Minister

KVKs of ICAR-ATARI, Zone XI actively took part in the live telecast of PM Kisan Samman Nidhi by Hon'ble Prime Minister Shri Narendra Modi on 25 December, 2020. A total of 17074 farmers and 600 staff were registered to the live telecast, out of which 2455 farmers and 480 staff viewed the programme at their respective KVKs. Speaking on the occasion, the Hon'ble Prime Minister highlighted that the investment and innovation in agriculture should improve like other sectors. He highlighted farmer-centric initiatives of the Government like soil health cards, neem coating of urea and distribution of solar pumps for reducing the input cost for the farmers. He also emphasized that government tried to ensure better crop insurance cover to farmers. Due to this millions of farmers are getting the benefit of PM crop insurance scheme. He also said that government is also making efforts to ensure that farmers get fair price for their produce as the government fixed one and a half times the production cost as MSP for the farmers as per the recommendations of the Swaminathan Committee Report. He added that the number of crops for which MSP is available were also increased. The Government aimed to open new markets for the farmers to sell their crop in more than thousand agricultural mandis of the country online. The Hon'ble Prime Minister further said that Government worked



KVK, Idukki

towards forming groups of small farmers so that they can work as a collective force in their region. Shri Narendra Singh Tomar, Hon'ble Union Minister of Agriculture & Farmers' Welfare emphasized that under the leadership of Hon'ble Prime Minister, various schemes are being implemented at the grass-root level to strengthen the agricultural sector of the country. Dr.B.T.Rayudu, Principal Scientist, Dr.D.V.Kolekar, Scientist and Dr.M.B.Hanji, Chief Technical Officer coordinated the event for KVKs in Zone XI.



KVK, Kozhikode



KVK, Gadag

### 1.3 Budget

A total of ₹. 8765.31 lakh was sanctioned for the year 2020-21 and another ₹. 499.72 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 2020-21**

Heads	Sanction (Amount in lakhs)			
	ATARI	KVKs/ ICAR Institutes	Support to DEE at SAUs	Total
<b>(A) Recurring</b>				
Pay & Allowance	266.95	7253.23	0	7520.18
T.A	4.18	52.91	2.81	59.90
HRD	12.49	0	2.00	14.49
Contingencies	48.56	600.84	20.09	669.49
<b>Total (A)</b>	<b>332.18</b>	<b>7906.98</b>	<b>24.90</b>	<b>8264.06</b>
<b>(B) Non Recurring</b>				
Works	0	359.16	0	359.16
Furniture & Equipment	20.00	122.09	0	142.09
Vehicle	0	0	0	0
Library	0	0	0	0
Revolving Fund	0	0	0	0
<b>Total (B)</b>	<b>20.00</b>	<b>481.25</b>	<b>0</b>	<b>501.25</b>
<b>Total (A+B)</b>	<b>352.18</b>	<b>8388.23</b>	<b>24.90</b>	<b>8765.31</b>
<b>(C) Special Programmes</b>				
ARYA	9.94	114.26	0	124.20
NICRA	0.95	89.05	0	90.00
NFSM	2.25	99.16	0	101.41
NMOOP	2.15	87.90	0	90.05
FFP	0.96	45.50	0	46.46
DAMU	0	47.60	0	47.60
<b>Total C</b>	<b>16.25</b>	<b>483.47</b>	<b>0</b>	<b>499.72</b>
<b>Total (A+B+C)</b>	<b>368.43</b>	<b>8871.70</b>	<b>24.90</b>	<b>9265.03</b>

## Chapter - 2

# About Krishi Vigyan Kendras (KVKs)

The Indian Council of Agricultural Research, New Delhi has established Krishi Vigyan Kendras in each district and additional KVK in larger districts in the country. The ICAR-ATARI is playing a vital role in orienting the KVKs to function as knowledge and resource centres at the district level for serving the farmers, farmwomen, rural youth, extension functionaries and other stakeholders through selected agricultural technologies.

This chapter consists of following heads :

- 2.1 Establishment of KVKs
- 2.2 Vision, mission, mandate and activities of KVKs
- 2.3 Staff strength of KVKs
- 2.4 Infrastructure at KVKs
- 2.5 Scientific Advisory Committee
- 2.6 Revolving fund
- 2.7 Thrust areas



## 2. About Krishi Vigyan Kendras (KVKs)

Krishi Vigyan Kendra (KVK) is the agricultural knowledge and resource centre for farmers, farm women, rural youth, extension functionaries and other stakeholders involved in agriculture development. This is an innovative district level institution meant for promoting science-based practices in agriculture and allied sectors in a problem-solving mode. KVKs accomplish this through assessment, demonstration and capacity development on location specific technology modules. Besides, they also perform related 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, under reorganization of zones exercise, 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	07	03	04	14
Lakshadweep	-	-	01	01
<b>Total</b>	<b>33</b>	<b>8</b>	<b>7</b>	<b>48</b>

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 547 (71.22%) were in position. Details of state-wise and category wise staff strength of KVKs are furnished in Table 5.

## 2.4 Infrastructure at KVKs

State wise details of infrastructure in KVKs of Zone XI are presented in Table 6. As on December, 2020, 47 KVKs have administrative building, 42 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, seven KVKs have portable carp hatchery, three KVKs have minimal processing unit and 14 KVKs have plant health diagnostic labs except lakshdweep all 47 KVKs are provide with four-wheelers. All together there are 80 demonstration units and 94 two-wheelers in the KVKs.

**Table 5: State wise and category wise staff strength of KVKs (as on 31.12.2020)**

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 Scientists)	33	30	14	14	1	0	48	44
Scientists (Subject Matter Specialists)	198	152	84	70	6	1	288	223
Programme Assistants	99	74	42	22	3	0	144	96
Administrative staff	66	42	28	22	2	0	96	64
Drivers	66	44	28	17	2	0	96	61
Supporting staff	66	34	28	23	2	2	96	59
<b>Total</b>	<b>528</b>	<b>376</b>	<b>224</b>	<b>168</b>	<b>16</b>	<b>3</b>	<b>768</b>	<b>547</b>
<b>Filled (%)</b>	<b>71.21</b>		<b>75.00</b>		<b>18.75</b>		<b>71.22</b>	

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

**Table 6: State wise details of infrastructure in KVKs**

Type of infrastructure	Infrastructure (No.)			
	Karnataka	Kerala	Lakshadweep	Total
Administrative buildings	33	14	0	47
Farmers hostels	30	12	0	42
Staff quarters	19	9	0	28
Demonstration units	49	31	0	80
Rainwater harvesting units	10	6	0	16
E-connectivity	11	10	0	21
Soil and water testing labs	24	13	1	38
Portable carp hatcheries	4	3	0	7
Minimal processing units	1	2	0	3
Plant health diagnostic labs	9	5	0	14
Four wheelers	33	14	0	47
Two wheelers	63	28	3	94



Administrative building (KVK, Kollam)



Administrative building (KVK, Alappuzha)



Campus (KVK, Bengaluru Rural)



Administrative building (KVK, Belagavi-II)



Administrative building (KVK, Bagalakote)



Farmers hostel (KVK, Koppal)



Pig unit (KVK, Udupi)



Administrative building (KVK, Pathanamthitta)

**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, district level 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. It is noteworthy to mention here that all KVKs conducted SAC meeting during the reporting period.



SAC meeting (KVK, Chitradurga)

### 2.6 Revolving fund

Revolving fund provided by ICAR is in operation at 45 KVKs of the Zone and the remaining three have revolving fund of their own. KVKs are utilizing revolving fund for production of technological products and the net available balance as on 31 December, 2020 was ₹. 10.64 crore. Twenty KVKs had closing balance of more than ₹. 20.00 lakh, 17 KVKs had a balance in the range of ₹. 10.00 to 20.00 lakh, five KVKs had closing balance in the range of ₹. 4.00 to 10.00 lakh and six KVKs had closing balance less than ₹. 4.00 lakh.

### 2.7 Thrust areas

Based on the agro-ecological situation and prevailing cropping and farming systems, KVKs are broadly working on the following thrust areas keeping in view the strategy for Doubling of Farmers Income (DFI) as set by Hon'ble Prime minister:

- 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 interventions.
- 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.

Fig value addition (KVK, Dakshina Kannada)



## Chapter - 3

# Achievements

The ICAR-ATARI is being guiding KVKs in terms of technology and methodology back stopping for implementation of mandated activities through formulation of various technical programmes. Further, the ICAR-ATARI is being structuring the technical programme of KVKs through conducting SAUs level and state level annual action plan workshops in association with the Directorate of Extension Education of State Agricultural Universities before start of *kharif* season every year wherein technical programmes for each KVK are discussed and finalized. Accordingly, KVKs are being implementing the action plan under the technical guidance of ICAR-ATARI and their respective Directorate of Extension and host organization.

This chapter consists of the following heads :

- 3.1 Krishi Vigyan Kendras
- 3.2 Special Programmes
- 3.3 Technological Backstopping by Directorate of Extension



### 3. Achievements

#### 3.1 Krishi Vigyan Kendras

Achievements of KVKs are briefly presented here under

##### 3.1.1. Technology Assessment

Technology assessment through 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 2020 are presented under this head. KVKs conducted 215 OFTs under crops, 33 OFTs under livestock and 10 OFTs under enterprises categories. Details of thematic areas covered under each category and brief results are presented below.

##### 3.1.1.1 Crops

###### (a) State and crop wise technology assessment

KVKs of Zone XI had carried out technology assessment under different crop categories and details are presented in Table 7. Data indicated that the KVKs have done technology assessment through 215 OFTs of which 150 OFTs were by KVKs of Karnataka and 65 OFTs by KVKs of Kerala. More OFTs were taken up on vegetable crops (63 OFTs) in both the states (39 OFTs in Karnataka and 24 OFTs in Kerala), followed by pulses (28 OFTs) and commercial crops (20 OFTs) in

Karnataka, whereas in Kerala, it was on tuber crops (11 OFTs).

###### (b) Thematic area wise technology assessment

In Zone XI, technology assessment on various crops was carried out in 14 different thematic areas as detailed in Table 8, in which KVKs altogether assessed 497 technological options by involving 947 farmers in 421 locations. Varietal evaluation was the major theme wherein 212 technologies were assessed by 41 KVKs in the field of 409 farmers belonging to 186 locations. Next major theme was Integrated Nutrient Management wherein 61 technologies were assessed followed by Integrated Disease Management (51), Integrated Pest Management (48), resource conservation technology (45), cropping systems (21), Integrated Crop Management (21), farm machineries (15), drudgery reduction (5), storage techniques (4), value addition (4), small scale income generation enterprises (3) and seed/plant production (2).

Table 7: State and crop wise technology assessment through KVKs

Crop category	OFTs (No.)		
	Karnataka	Kerala	Total
Cereals	15	5	20
Oilseeds	16	0	16
Pulses	28	1	29
Millets	4	1	5
Commercial	20	1	21
Vegetables	39	24	63
Fruits	6	8	14
Medicinal	4	0	4
Flowers	2	0	2
Plantations	7	1	8
Spices	8	8	16
Tubers	0	11	11
Others	1	5	6
<b>Total</b>	<b>150</b>	<b>65</b>	<b>215</b>

**Table8: Thematic area wise technology assessment on crops by KVKs in Zone XI**

	crops			
Varietal evaluation	212	409	41	186
Integrated Nutrient Management	61	120	22	51
Integrated Disease Management	51	94	17	45
Integrated Pest Management	48	82	17	35
Resource conservation technology	45	74	17	31
Cropping systems	21	48	9	15
Integrated Crop Management	21	39	9	21
Farm machineries	15	34	6	13
Drudgery reduction	5	15	3	5
Others - wild boar management	5	10	2	6
Storage techniques	4	6	1	2
Value addition	4	8	2	4
Small scale income generation enterprises	3	6	2	6
Seed/Plant production	2	2	2	1
<b>Total</b>	<b>497</b>	<b>947</b>		<b>421</b>

**Karnataka**

Thematic area wise technology assessment on crops taken up by KVKs in Karnataka is presented in Table 9. Data indicated that 344 technological options were assessed in 10 thematic areas by involving 628 farmers in 252 locations by involving across all 33 KVKs that efforts encompassing all the major crops of the state. More number of technology options were assessed

under the theme varietal evaluation (143) followed by Integrated Nutrient Management (48), resource conservation technology (38), Integrated Disease Management (37), Integrated Pest Management (26), cropping systems (18), Integrated Crop Management (16), farm machineries (9), drudgery reduction (5) and storage techniques (4).

**Table 9: Thematic area wise technology assessment on crops by KVKs in Karnataka**

Thematic area	Technology assessment on			
	Technology options (No.)	Farmers (No.)	KVKs (No.)	Locations (No.)
Varietal evaluation	143	256	27	107
Integrated Nutrient Management	48	90	17	32
Resource conservation technology	38	59	14	27
Integrated Disease Management	37	59	12	28
Integrated Pest Management	26	46	10	18
Cropping systems	18	43	8	13
Integrated Crop Management	16	29	7	14
Farm machineries	9	25	4	6
Drudgery reduction	5	15	3	5
Storage techniques	4	6	1	2
<b>Total</b>	<b>344</b>	<b>628</b>		<b>252</b>

## Kerala

Thematic area wise technology assessment on crops taken up by KVKs in Kerala is presented in Table 10. Data indicated that 153 technological options were assessed in 12 thematic areas by involving 319 farmers in 169 locations by involving all 14 KVKs that efforts, encompassing covering all the major crops of the state. More number of technology options were assessed under theme varietal evaluation (69) followed by Integrated Pest Management (22), Integrated Disease Management (14), Integrated Nutrient Management (13), resource conservation technology (7), farm machineries (6), Integrated Crop Management (5), others-wild boar management (5), value addition (4), cropping systems (3), small scale income generation enterprises (3) and seed/plant production (2).

## (c) Assessment of crop production technologies and varieties in specific locations-selected cases

### (i) Panama wilt in banana

Two KVKs viz., Haveri and Uttara Kannada in Karnataka assessed two technology options viz., drenching with copper oxychloride @ 3 gm/ liter of water as technology option-1, and stem injection with 3 gm of carbendazim + 3 gm of copper oxychloride + 3 gm of boric acid per liter of water as technology option-2 along with farmers practice against panama wilt in banana (Table 11). Data indicated that technology option-2 proved better in managing the disease in both locations. The disease incidence was almost nil with this technology in Uttara Kannada district.

**Table 10: Thematic area wise technology assessment on crops by KVKs in Kerala**

Thematic area	Technology assessment on crops			
	Technology options (No.)	Farmers (No.)	KVKs (No.)	Locations (No.)
Varietal evaluation	69	153	14	79
Integrated Pest Management	22	36	7	17
Integrated Disease Management	14	35	5	17
Integrated Nutrient Management	13	30	5	19
Resource conservation technology	7	15	3	4
Farm machineries	6	9	2	7
Integrated Crop Management	5	10	2	7
Others - wild boar management	5	10	2	6
Value addition	4	8	2	4
Cropping systems	3	5	1	2
Small scale income generation enterprises	3	6	2	6
Seed/Plant production	2	2	2	1
<b>Total</b>	<b>153</b>	<b>319</b>		<b>169</b>

**Table 11: Assessment of technology options against panama wilt in banana**

Parameter	KVK	Farmers practice	Technology options	
			1	2
Yield (q/ha)	Haveri	227.00	258.20	294.00
	Uttarakannada	350.00	425.00	475.00
Wilt (%)	Haveri	35.56	21.47	16.82
	Uttarakannada	25.00	11.00	1.00
Net income ( ₹ /ha)	Haveri	267400.00	320780.00	385600.00
	Uttarakannada	174333.00	236500.00	302500.00
BCR	Haveri	2.63	2.88	3.22
	Uttarakannada	2.24	2.62	3.42

Technology option-1: Drenching with copper Oxychloride @ 3 gm/ liter of water  
 Technology option-2: Stem injection with 3 gm of carbendazim + 3 gm of copper oxychloride + 3 gm of boric acid per liter of water

### (ii) Yellow Mosaic Virus (YMV) in ridge gourd

Three KVKs viz., Bengaluru Rural, Ramanagara and Mandya in Karnataka assessed three technology options viz., seed treatment with imidacloprid (70 WG), sowing of border crop, spraying of Imidacloprid 17.8 SL (30 DAS) and Thiomethaxam 25 WG (45 DAS) as technology option-1, sowing of border crop (SA Tall maize), soil application of carbofuran 1.5 kg/ha., 5% NSKE spray, spraying of Imidacloprid 17.8 SL (30 DAS) as technology option-2, and seed treatment with Thiomethaxam 25 WG – 5g/kg seeds, black silver mulch, intercropping/border crop of maize, soil application of *Pseudomonas fluorescens* + neem cake, yellow sticky trap @ 10 no/acre, spray neem soap (5g/l), Salicylic acid 2m and Entomopathogenic fungus *Beauveria bassiana* @ 1litre/acre, Thiamethoxam 25% WG (0.05%) and Imidacloprid 17.8 SL (0.1%) as technology option-3 along with farmers practice against Yellow Mosaic Virus (YMV) in ridge gourd and results

are presented in Table 12. Results show that the technology option-3 was found to be more effective in managing the YMV with less than 8% disease incidence in all three locations.



Assessment of management of yellow mosaic virus in ridge gourd (KVK, Ramanagara)

**Table 12: Assessment of technology options against yellow mosaic virus in ridge gourd**

Parameter	KVK	Farmers practice	Technology options		
			1	2	3
Yield (q/ha)	Bengaluru Rural	292.50	282.70	275.00	337.60
	Ramanagara	277.20	280.80	299.70	340.70
	Mandya	286.50	299.70	306.40	350.60
YMV incidence (%)	Bengaluru Rural	22.47	20.13	17.96	6.55
	Ramanagara	21.89	18.84	16.76	7.13
	Mandya	24.98	20.34	16.58	7.58
Net income (₹./ha)	Bengaluru Rural	435850.00	426600.00	407500.00	529450.00
	Ramanagara	412133.00	422383.00	444945.00	536508.00
	Mandya	435355.00	425203.00	408199.00	551466.00
BCR	Bengaluru Rural	3.92	4.07	3.86	4.63
	Ramanagara	3.90	4.04	4.15	4.70
	Mandya	3.98	4.02	3.86	4.80
Technology option-1: Seed treatment with imidacloprid (70 WG), sowing of border crop, spraying of Imidacloprid 17.8 SL (30 DAS) and Thiomethaxam 25 WG (45 DAS)					
Technology option-2: Sowing of border crop (SA Tall maize), soil application of carbofuran 1.5 kg/ha., 5% NSKE spray, spraying of Imidacloprid 17.8 SL (30 DAS)					
Technology option-3: Seed treatment with Thiomethaxam 25 WG – 5g/kg seeds, black silver mulch, intercropping/border crop of maize, soil application of <i>Pseudomonas fluorescens</i> + neem cake, yellow sticky trap @ 10 no/acre, spray neem soap (5g/l), Salicylic acid 2m and Entomopathogenic fungus <i>Beauveria bassiana</i> @ 1litre/acre, Thiamethoxam 25% WG (0.05%) and Imidacloprid 17.8 SL (0.1%)					

**(iii) Chickpea varieties against dry root rot**

Two KVKs viz., Bidar and Vijayapura-II in Karnataka assessed two chickpea varieties viz., BGD-103 and NBeG-47 along with farmers practice (JG-11) against dry root rot and results are presented in Table 13.

Results revealed that chickpea variety BGD-103 reported less dry root rot incidence in Bidar, whereas variety NBeG-47 gave better performance in Vijayapura district.

**(iv) Yellow Vein Mosaic (YVM) tolerant okra varieties /hybrids**

Two KVKs viz., Palakkad and Malapuram in Kerala assessed YVM tolerant okra varieties/hybrids viz., Arka Anamika, Susthira, CO BhH-1 and Manjima along with farmers practice in Kerala conditions and results are presented in Table-14. Results indicated that

Okra hybrid CoBhH-1 gave highest BCR of 2.85 in Malappuram district with a yield of 187.70 q/ha.

**(v) Nano fertilizer (N and Zn) for hybrid maize**

Two KVKs viz., Chikkamagaluru and Davanagere in Karnataka assessed two technology options viz., soil test based nutrient management (RDF: 100:50:25 NPK kg/ha) 50% N and K, full P as basal, 25% N at 30 DAS, 25% N % and 50 % K at tasselling stage as technology option-1 and application of 25 % N as basal dose (25 kg N/ha) 50% K & full P as basal, 25% N at 25-30 DAS, 50 % K at tasselling stage, N and Zn Nano fertilizer spray at 30DAS (4 ml/l) and 20 days after first spray as technology option-2 along with farmers practice (application of NP fertilizers as basal dose and top dressing with N fertilizer, no or less application of K fertilizer) and results are presented in Table 15. Results indicated that technology option-3 performed better on yield and income as compared to conventional sources of nutrients in both the locations.

**Table 13: Assessment of chickpea varieties against dry root rot**

Parameter	KVK	Farmers practice (JG-11)	Chickpea varieties	
			BGD-103	NBeG-47
Yield (q/ha)	Bidar	11.50	13.75	13.00
	Vijayapura-II	11.06	13.80	14.50
Dry root rot (%)	Bidar	9.80	4.50	8.10
	Vijayapura-II	10.00	8.89	7.78
Net income (₹./ha)	Bidar	28450.00	37270.00	34040.00
	Vijayapura-II	18740.00	28450.00	31665.00
BCR	Bidar	2.43	2.82	2.66
	Vijayapura-II	1.73	2.06	2.20

**Table 14: Assessment of YVM tolerant okra varieties/hybrids in Kerala**

Parameter	KVK	Farmers practice	Okra varieties		Okra hybrids	
			Arka Anamika	Susthira	CO BhH-1	Manjima
Yield (q/ha)	Palakkad	95.70	91.20	110.00	-	-
	Malappuram	-	101.50	-	187.70	149.00
Net income (₹./ha)	Palakkad	77472.00	67443.00	105417.00	-	-
	Malappuram	-	93692.00	-	304978.00	182674.00
BCR	Palakkad	1.68	1.57	1.92	-	-
	Malappuram	-	1.58	-	2.85	1.96

**Table 15: Assessment of nano fertilizer (N and Zn) for hybrid maize**

Parameter	KVK	Farmers practice	Technology options	
			1	2
Yield (q/ha)	Chikkamagaluru	52.80	58.60	63.50
	Davanagere	46.10	48.16	49.50
Net income (₹./ha)	Chikkamagaluru	44760.00	52120.00	56950.00
	Davanagere	19175.00	22426.00	24725.00
BCR	Chikkamagaluru	1.99	2.09	2.11
	Davanagere	1.45	1.53	1.59

Farmers practice : Application of NP fertilizers as basal dose and top dressing with N fertilizer, no or less application of K fertilizer

Technology option-1: Soil test based nutrient management (RDF: 100:50:25 NPK kg/ha) 50% N and K, full P as basal, 25% N at 30 DAS, 25% N % and 50 % K at tasselling stage

Technology option-2: Application of 25 % N as basal dose (25 kg N/ha) 50% K & full P as basal, 25% N at 25-30 DAS, 50 % K at tasselling stage, N and Zn Nano fertilizer spray at 30DAS (4 ml/l) and 20 days after first spray



Assessment of nano fertilizer use in hybrid maize (KVK, Davanagere)

### (vi) Nano organic NPK formulation for okra in Kerala

Two KVKs viz., Kollam and Kottayam in Kerala assessed two technology options viz., lime @ 500kg/ha + FYM @ 20t/ha + PGPR mix I @ 2.5 kg /ha + top dressing with vermi wash @ 500L/ha at 10-15 days interval as technology option-1 and lime as per soil test value + FYM (20t ha-1) + soil application of nano NPK formulation (25 kg/ha) foliar application of nano NPK formulation (0.2%) at 15 days interval as technology option-2 along with farmers practice (lime as per soil test value + FYM @ 20t/ha + NPK @ 110:35:70 kg/ha). Results indicated that technology option-2 performed better in Kottayam in terms of yield (141.92 q/ha) as compared to farmers practice (134.75 q/ha) and technology option-1 (114.19 q/ha). Whereas in case of Kollam, technology option-1 performed better with yield (107.50 q/ha) followed by farmers practice (97.00 q/ha) and technology option-2 (92.30 q/ha).



Assessment of nano fertilizer in okra (KVK, Kollam)

### (vii) Sulphur nutrition in onion

Three KVKs viz., Vijayapura-II, Dharwad and Chikkamagalur in Karnataka assessed three technology

options viz., NPKS : 110:40:60:20 kg / ha and *Azospirillum* and PSB @ 5 kg each/ha as technology option-1, NPKS : 100:50:50:30 kg/ha and *Azotobacter* and PSB @ 5 kg each/ha as technology option-2 and NPK: 125:75:125 kg/ha (No sulphur), vegetable special (30 and 45 DAS) as technology option - 3 along with farmers practice for utility of sulphur nutrition in onion crop and results are presented in Table 16. Results show that the technology option-2 i.e sulphur 30 kg/ha along with *Azotobacter* and PSB @ 5 kg each/ha performed better in Vijayapura-II and Dharwad districts. Use of vegetable special in technology option-3 from IIHR also performed better in Chikkamagaluru district with a BCR of 3.29.

### (viii) Soil acidity management using dolomite in paddy

Two KVKs viz., Palakkad and Malappuram in Kerala assessed dolomite with three technology options viz., powdered dolomite as technology option-1, lime + gypsum as technology option-2 and Granular dolomite as technology option-3 along with farmers practice (no lime) for soil acidity management in paddy and results are presented in Table 17. Results revealed that technology option-2 (use of lime + gypsum) performed better than both technology options powdered dolomite as well as granular dolomite in Palakkad district with a BCR ratio of 3.70.

### (ix) Eco-friendly management of rice bug

Two KVKs viz., Kottayam and Alappuzha in Kerala assessed three technology options viz., Malathion 1.00 l/ha as technology option-1, Fish Amino Acid 6ml/l as technology option-2 and Chitin based *Pseudomonas* 2.5kg/ha as technology option-3 along with farmers practice (field torches) for the management of rice bug and results are presented in Table 18. Results indicated that technology option-1 i.e Malathion application was better than the Fish Amino Acid as well as Chitin based *Pseudomonas* with higher yield and BCR in both the locations.

### (x) Uzify in silkworm rearing

Two KVKs viz., Kolar and Mandya in Karnataka assessed three technology options viz., fix the nylon net and tag the 2 Pouch *Nesolynx thymus* during silkworm rearing as technology option-1, fix the nylon net + yellow sticky trap as technology option-2 and fix the nylon net + sex pheromone trap as technology option-3 along with farmers practice (fix the nylon net to windows and doors) for management of uzify in silkworm rearing and results are presented in Table 19. Results show that the technology option-3 i.e nylon net + sex pheromone trap was found to be better in both the locations in terms of yield, net income as well as BCR.

**Table 16: Assessment of sulphur nutrition in onion**

Parameter	KVK	Farmers practice	Technology options		
			1	2	3
Yield (q/ha)	Vijayapura-II	138.00	146.00	155.00	-
	Dharwad	145.20	170.60	179.00	-
	Chikkamagaluru	52.00	67.00	-	79.00
Net income (₹./ha)	Vijayapura-II	294387.00	348483.00	404035.00	-
	Dharwad	72700.00	94100.00	102500.00	-
	Chikkamagaluru	164000.00	230000.00	-	275000.00
BCR	Vijayapura-II	6.05	6.83	7.63	-
	Dharwad	2.00	2.23	2.34	-
	Chikkamagaluru	2.75	3.19	-	3.29

Technology option-1: NPKS : 110:40:60:20 kg / ha and *Azospirillum* and PSB @ 5 kg each/ha  
 Technology option-2: NPKS : 100:50:50:30 kg/ha and *Azotobacter* and PSB @ 5 kg each/ha  
 Technology option-3: NPK: 125:75:125 kg/ha (No sulphur), Vegetable special (30 & 45 DAS)

**Table 17: Assessment of soil acidity management using dolomite in paddy**

Parameter	KVK	Farmers practice (No lime)	Technology options		
			1	2	3
Yield (q/ha)	Palakkad	50.00	69.00	82.00	58.00
	Malappuram	57.50	62.50	-	67.50
pH	Palakkad	4.44	5.56	6.50	6.00
	Malappuram	5.70	5.70	-	5.70
Net income (₹./ha)	Palakkad	74000.00	122400.00	156200.00	93800.00
	Malappuram	87400.00	104475.00	-	117550.00
BCR	Palakkad	2.30	3.10	3.70	2.60
	Malappuram	2.10	2.40	-	2.60

Technology option-1: Powdered dolomite  
 Technology option-2: Lime + Gypsum  
 Technology option-3: Granular dolomite

**Table 18: Assessment of eco-friendly management of rice bug**

Parameter	KVK	Farmers practice	Technology options		
			1	2	3
Yield (q/ha)	Kottayam	53.00	54.00	52.50	52.00
	Alappuzha	42.00	42.25	41.75	41.50
Bugs (No./hill)	Kottayam	-	-	-	-
	Alappuzha	0.54	0.42	0.50	0.56
Net income (₹./ha)	Kottayam	88000.00	92000.00	87500.00	86200.00
	Alappuzha	36400.00	38795.00	37425.00	36550.00
BCR	Kottayam	2.76	2.92	2.79	2.76
	Alappuzha	1.49	1.54	1.53	1.51

Technology option-1: Malathion 1.00 l/ha  
 Technology option-2: Fish Amino Acid 6ml/l  
 Technology option-3: Chitin based *Pseudomonas* 2.5kg/ha

**Table 19: Assessment of management of uzifly in silkworm rearing**

Parameter	KVK	Farmers practice	Technology options		
			1	2	3
Yield (kg/100 DFL)	Kolar	79.31	82.90	87.62	92.45
	Mandya	80.06	85.20	87.36	87.59
Net income (₹./100 DFL)	Kolar	19241.00	21731.00	23709.00	25920.00
	Mandya	25618.00	26412.00	26209.00	28903.00
BCR	Kolar	2.83	3.05	3.18	3.34
	Mandya	2.78	2.63	2.50	2.94

Technology option-1: Fix the nylon net and tag the 2 Pouch *Nesolynx thymus* during silkworm rearing  
 Technology option-2: Fix the nylon net + Yellow sticky trap  
 Technology option-3: Fix the nylon net + Sex pheromone trap

**(xi) Compost cultures for decomposing of crop residue**

Three KVKs viz., Chikkaballapura, Ramanagara and Mandya in Karnataka assessed six technology options viz., seri farm waste + cow dung slurry + compost culture as technology option-1, seri farm waste + rock phosphate + microbial culture as technology option-2, waste decomposer (2kg jaggery in 200 lt. water + waste decomposer), 20 lt. as technology option-3, waste decomposer (2kg jaggery in 200 lt. water + waste decomposer), 50 lt. as technology option-4, waste decomposer (2kg jaggery in 200 lt. water + waste decomposer), 100 lt. as technology option-5 and waste decomposer (2kg jaggery in 200 lt. water + waste decomposer), 200 lt. as technology option-6 along with farmers practice (seri farm waste + cow dung slurry) for better and effective decomposition of crop residue and agricultural waste using different compost cultures and results are presented in Table 20. Results indicated that the technology option-6 (NCOF culture) was found

better and took least duration (80 days) for compost preparation, but at higher dosage of 200 lt. per tonne of waste material.



Assessment of compost cultures (KVK, Chikkaballapura)

**Table 20: Assessment of compost cultures in decomposing of crop residue**

Parameter	KVK	Farmers practice	Technology options					
			1	2	3	4	5	6
Yield (kg/ton of waste)	Chikkaballapura	790.00	840.00	870.00	805.00	860.00	865.00	890.00
	Ramanagara	780.00	855.00	855.00	785.00	870.00	874.00	878.00
	Mandya	785.00	820.00	850.00	800.00	860.00	870.00	875.00
Time taken (Days)	Chikkaballapura	256	105	98	160	100	95	85
	Ramanagara	260	85	95	135	90	85	80
Net income (₹./ batch)	Chikkaballapura	2566.00	6640.00	7141.00	4156.00	7313.00	7624.00	8769.00
	Ramanagara	3115.00	8797.00	7855.00	6075.00	8495.00	8752.00	9232.00
	Mandya	1970.00	5448.00	5640.00	2999.00	6073.00	6371.00	6729.00

Technology option-1: Seri farm waste + Cow dung slurry + Compost culture  
 Technology option-2: Seri farm waste + Rock phosphate + Microbial culture  
 Technology option-3: Waste decomposer (2kg jaggery in 200L water + waste decomposer), 20 liters  
 Technology option-4: Waste decomposer (2kg jaggery in 200L water + waste decomposer), 50 liters  
 Technology option-5: Waste decomposer (2kg jaggery in 200L water + waste decomposer), 100 liters  
 Technology option-6: Waste decomposer (2kg jaggery in 200L water + waste decomposer), 200 liters

**(xii) Microbial cultures for composting of crop residue and agricultural waste**

Two KVKs viz., Kottayam and Alappuzha in Kerala assessed two technological options viz., KAU inoculum-composting tonic (200-250ml tonic after 4 times dilution, over 6 inch waste + 6 inch dry leaves) as technology option-1 and composting inoculum' (Vellayani)-@5-10g/kg organic waste as technology option-2 along with farmers practice (EM Solution: spraying the ready to use solution over moist heaps @ 250 ml for 1m waste) for hastening the composting of crop residue and agricultural waste material and results are presented in Table 21. Results revealed that among the technological options tested, farmers practice (EM solution) was found to be better with 63 days taken for complete decomposition. However, composting tonic of KAU (technology option-1) gave high yield of compost (160 kg) per tonne of bio-waste in Kottayam district.

**(xiii) Chickpea varieties under rainfed conditions**

Four KVKs viz., Chikkamagaluru, Ballari, Chamarajanagara and Raichur in Karnataka assessed six chickpea varieties viz., JG-11, BGD-103, NBeG-47, NBeG-49, JAKI-9218 and Super Annigeri along with farmers local variety (A-1) under rainfed conditions spread over different agro climatic zones and results are presented in Table 22. Results indicated that the highest yield of 18.59 q/ha was recorded by NBeG-47 in Raichur district followed by 17.50 q/ha in BGD 103 in Ballari district.



Assessment of chickpea varieties (KVK, Raichur)

**(xiv) Green chilli hybrids under irrigated conditions**

Three KVKs – Haveri, Vijayapura-I and Tumakuru-I in Karnataka assessed four green chilli hybrids viz. Arka Meghana, Arka Harita, KBCH-1 and Arka Khyati along with farmers practice (Private hybrids) under irrigated conditions and results are presented in Table 23. Results revealed that Arka Meghana yielded maximum with 342.50 q/ha followed by Arka Khyati (292.50 q/ha) in Vijayapura district.



Assessment of chilli varieties by KVK Vijayapura I

**Table 21: Assessment of microbial cultures for composting of crop residues and agricultural waste**

Parameter	KVK	Farmers practice	Technology options	
			1	2
Compost (kg / ton of biowaste)	Kottayam	140.00	160.00	120.00
	Alappuzha	150.00	150.00	150.00
Moisture(%)	Kottayam	24.90	24.40	23.30
	Alappuzha	24.80	24.10	23.10
Duration (days)	Kottayam	63	67	82
	Alappuzha	65	68	80
BCR	Kottayam	1.56	1.42	1.33
	Alappuzha	1.50	1.51	1.20

Technology option-1: KAU inoculum-Composting tonic (200-250ml tonic after 4 times dilution, over 6 inch waste+6 inch dry leaves)

Technology option-2: Composting inoculum' (Vellayani)-@5-10g/kg organic waste

**Table 22: Assessment of chickpea varieties under rainfed conditions**

KVK	Local (A-1)	Chickpea varieties and yield (q/ha)					
		JG-11	BGD- 103	NBeG-47	NBeG-49	JAKI-9218	Super Annigeri
Chikkamagaluru	-	14.50	10.00	-	-	-	15.50
Ballari	-	15.50	17.50	16.00	-	-	-
Chamarajanagara	10.02	10.78	16.08	-	-	15.40	-
Raichur	14.81	15.56	-	18.59	17.34	-	-

**Table 23: Assessment of green chilli hybrids under irrigated conditions**

KVK	Green chilli hybrids and yield (q/ha)				
	Farmers practice (Private hybrids)	Arka Meghana	Arka Harita	KBCH-1	Arka Khyati
Haveri	218.60	272.00	-	257.50	-
Vijayapura-I	255.00	342.50	-	-	292.50
Tumakuru-I	205.50	-	225.60	230.50	-

**(xv) Groundnut varieties for drought under rainfed conditions**

Eight KVKs-Gadag, Tumakuru-II, Dharwad, Haveri, Davanagere, Ballari, yadgir and Belagvi-I in Karnataka tested 10 varieties of groundnut viz., DGRMB-24, DSG-1, GPBD-4, KDG-128, TG 37-A, DGRMB-32, G 2-52, JL-1085, K-6 and DH-256 along with farmers local variety against drought under rainfed conditions and results are presented in Table 24. Results indicated that G2-52 gave high yield of 32.90 q/ha in Davanagere followed by 30.25 q/ha in DH-256 in Yadgir. Variety GPBD-4 also yielded (30.20 q/ha) on par with G 2-52 in Davanagere.



Assessment of groundnut varieties (KVK, Davanagere)

**Table 24: Assessment of groundnut varieties against drought under rainfed conditions**

KVK	Groundnut varieties and yield (q/ha)										
	Farmers practice	DGRMB-24	DSG-1	GPBD-4	KDG-128	TG 37-A	DGRMB-32	G 2-52	JL-1085	K-6	DH-256
Gadag	8.98	17.87	10.53	12.44	13.81	16.07	-	-	-	-	-
Tumakuru-II	-	13.46	-	-	-	3.06	13.11	-	-	9.95	-
Dharwad	16.70	-	-	21.35	-	-	-	-	22.93	-	-
Haveri	18.00	-	-	-	-	-	-	25.67	26.83	-	-
Davanagere	24.90	-	-	30.20	-	-	-	32.90	-	-	-
Ballari	18.20	-	-	-	21.80	-	-	-	-	21.30	-
Yadgir	-	-	-	-	-	-	-	-	-	-	30.25
Belagavi-I	15.93	-	-	-	22.70	-	-	21.88	-	-	-

**(xvi) Mustard as an alternate crop in paddy fallows**

Three KVKs -Tumakuru-II, Koppal and Raichur in Karnataka assessed five mustard varieties viz., PUSA-25, PUSA-28, PUSA-30, PUSA-31 and NRCHB-101 along with farmers local variety for their suitability as an alternate crop in paddy fallows and results are presented in Table 25. Results showed that PUSA-31 was found to be superior compared to four other varieties assessed with yield of 12.80 q/ha followed by PUSA-30 (11.50 q/ha) in Tumakuru-II. However, PUSA-25 performed better in Raichur (11.04 q/ha) where PUSA-30 yielded the least (9.28 q/ha). Highest BCR was also reported for PUSA-25.



Assessment of mustard varieties in paddy fallows  
(KVK, Raichur)

**Table 25: Assessment of mustard varieties in paddy fallow**

Parameter	KVK	Farmers practice	Mustard varieties				
			PUSA-25	PUSA-28	PUSA-30	PUSA-31	NRCHB-101
Yield (q/ha)	Tumakuru-II	-	-	9.70	11.50	12.80	-
	Koppal	4.65	-	-	5.35	-	6.10
	Raichur	-	11.04	-	9.28	-	10.57
Net income (₹./ha)	Tumakuru-II	-	-	77600.00	92000.00	102400.00	-
	Koppal	9150	-	-	11950.00	-	14950.00
	Raichur	-	55264.00	-	44724.00	-	52424.00
BCR	Tumakuru-II	-	-	3.15	3.73	4.15	-
	Koppal	1.97	-	-	2.26	-	2.58
	Raichur	-	6.03	-	5.07	-	5.78

**Table 26: Assessment of onion varieties for rabi season**

Parameter	KVK	Onion varieties		
		Arka Niketan	Bhima Shakti	Bhima Kiran
Yield (q/ha)	Chitradurga	255.00	272.00	246.00
	Tumakuru-II	226.26	213.11	231.33
Net income (₹./ha)	Chitradurga	166500.00	183500.00	157500.00
	Tumakuru-II	112645.00	103703.00	117897.00
BCR	Chitradurga	2.88	3.07	2.77
	Tumakuru-II	2.73	2.51	2.99

**(xvii) Onion varieties for rabi season**

Two KVKs-Chitradurga and Tumakuru-II in Karnataka assessed three onion varieties viz., Arka Niketan, Bhima Shakti and Bhima Kiran along with farmers local variety for rabi season and results are presented in Table 26. Results indicated that among the varieties assessed, Bhima Shakti was found to be superior with yield of 272.00 q/ha and BCR of 3.07 in Chitradurga.

**(xviii) High yielding varieties of paddy**

Three KVKs-Mysuru, Hassan and Shivamogga in Karnataka assessed five high yielding varieties of paddy viz., MTU-1010, RNR-15048, Gangavati Sona, JGL-1798 and KMLT-4 along with farmers local variety for yield maximization and results are presented in Table-27. Results revealed that RNR-15048 performed better both in Mysuru and Hassan with yield of 65.20 q/ha and 62.54 q/ha, respectively. Highest BCR was recorded for this variety at Hassan. However, at Shivamogga, KMLT-4 gave higher yield of 55.45 q/ha as compared to RNR-15048 (52.07 q/ha).



Assessment of paddy varieties (KVK, Shivamogga)

**(xix) Pigeonpea varieties for southern Karnataka**

Although pigeonpea is a major pulse crop in northern Karnataka, it is being promoted as a climate resilient crop in southern Karnataka under rainfed conditions. Keeping this in view, two KVKs - Chitradurga and

Tumakuru-I have assessed five varieties of pigeonpea viz., BRG-2, BSMR-736, BRG -5, BRG -4 Ujwala and TS-3R and along with farmers local variety for their suitability in rainfed conditions and results are presented in Table 28. Results indicated that BRG-5 was the best in Chitradurga with yield of 9.30 q/ha. However, BRG-2 was the best with a yield of 8.38 q/ha and BCR of 2.68 in Tumakuru-I.



Assessment of pigeonpea varieties (KVK, Chitradurga)

**Table 27: Assessment of high yielding varieties of paddy for yield maximization**

Parameter	KVK	High Yielding Varieties of paddy					
		Farmers practice	MTU-1010	RNR- 15048	Gangavati Sona	JGL-1798	KMLT- 4
Yield (q/ha)	Mysuru	44.20	44.40	65.20	-	-	-
	Hassan	55.00	-	62.50	50.53	-	-
	Shivamogga	-	-	52.07	-	43.40	55.45
Net income (₹./ha)	Mysuru	38440.00	21280.00	78460.00	-	-	-
	Hassan	66108.00	-	80820.00	60750.00	-	-
	Shivamogga	-	-	35037.00	-	27224.00	39456.00
BCR	Mysuru	1.80	1.50	2.70	-	-	-
	Hassan	2.70	-	2.93	2.55	-	-
	Shivamogga	-	-	1.66	-	1.58	1.73

**Table 28: Assessment of pigeonpea varieties for southern Karnataka**

Parameter	KVK	Pigeonpea varieties					
		BRG-2	BSMR-736	BRG-5	BRG-4	TS-3R	Ujwala
Yield (q/ha)	Chitradurga	7.30	8.90	9.30	-	-	-
	Tumakuru-I	8.38	-	-	7.81	6.95	6.67
Net income (₹./ha)	Chitradurga	16055.00	22513.00	24002.00	-	-	-
	Tumakuru-I	33739.00	-	-	32897.00	28653.00	27226.00
BCR	Chitradurga	1.95	2.20	2.35	-	-	-
	Tumakuru-I	2.68	-	-	2.56	2.36	2.29

### 3.1.1.2 Livestock

#### (a) State and livestock wise technology assessment

KVKs of Zone XI carried out technology assessment under livestock and the details are presented in Table 29. Data indicated that KVKs have done technology assessment through 33 OFTs of which 16 OFTs by KVKs of Karnataka and 17 OFTs by KVKs of Kerala. More OFTs were taken up on cattle (11 OFTs) in Karnataka, whereas in Kerala, it was on poultry (7 OFTs).

**Table 29: State and livestock wise technology assessment through KVKs**

Livestock	OFTs (No.)		
	Karnataka	Kerala	Total
Cattle	11	3	14
Goat	0	1	1
Poultry	2	7	9
Fisheries	3	6	9
<b>Total</b>	<b>16</b>	<b>17</b>	<b>33</b>

#### (b) Thematic area wise technology assessment

In Zone XI, technology assessment on livestock was carried out in five different thematic areas as detailed in Table 30, in which KVKs were altogether assessed 60 technological options by involving 145 farmers in 115

locations. More technology options were assessed under the thematic area evaluation of breeds (19) followed by feed and fodder (18), production and management (11), nutrition management (8) and disease management (4).

#### *Karnataka*

Thematic area wise technology assessment on livestock taken up by KVKs in Karnataka is presented in Table 31. Data showed that 33 technological options were assessed in five thematic areas by involving 78 farmers in 50 locations. More number of technology options assessed under the theme feed and fodder (18) followed by evaluation of breeds (9), nutrition management (2), production and management(2) and disease management (2).

#### *Kerala*

Thematic area wise technology assessment on livestock taken up by KVKs in Kerala is presented in Table 32. Data reveals that 27 technological options were assessed in four thematic areas by involving 67 farmers in 65 locations. More number of technology options were assessed under the theme evaluation of breeds (10) followed by production and management (9), nutrition management (6) and disease management (2).

**Table 30: Thematic area wise technology assessment on livestock by KVKs in Zone XI**

Thematic area	Technology assessment on livestock			
	Technology options (No.)	Farmers (No.)	KVKs (No.)	Locations (No.)
Evaluation of breeds	19	49	8	38
Feed and fodder	18	36	8	26
Production and management	11	23	5	23
Nutrition management	8	27	5	20
Disease management	4	10	2	8
<b>Total</b>	<b>60</b>	<b>145</b>		<b>115</b>

**Table 31: Thematic area wise technology assessment on livestock by KVKs in Karnataka**

Thematic area	Technology assessment on livestock			
	Technology options (No.)	Farmers (No.)	KVKs (No.)	Locations (No.)
Feed and fodder	18	36	8	26
Evaluation of breeds	9	24	4	13
Nutrition management	2	10	1	5
Production and management	2	3	1	3
Disease management	2	5	1	3
<b>Total</b>	<b>33</b>	<b>78</b>		<b>50</b>

**Table 32: Thematic area wise technology assessment on livestock by KVKs in Kerala**

Thematic area	Technology assessment on livestock			
	Technology options (No.)	Farmers (No.)	KVKs (No.)	Locations (No.)
Evaluation of breeds	10	25	4	25
Production and management	9	20	4	20
Nutrition management	6	17	4	15
Disease management	2	5	1	5
<b>Total</b>	<b>27</b>	<b>67</b>		<b>65</b>

**(c) Assessment of livestock production technologies and breeds in specific locations-few cases**

**(i) Poultry breeds for backyard**

Two KVKs - Bagalakote and Uttara Kannada in Karnataka and Idukki KVK in Kerala have assessed eight breeds of poultry viz., Swarnadhara, Kadaknath, Srinidhi, Gramapriya, CARI-Nirbhik, BV-380, Kalinga Brown and Krishi Bro along with local birds for their suitability as backyard poultry and results are presented in Table 33. Results showed that the best growth was reported for Swarnadhara with body weight of 2.85 kg/bird and highest BCR (4.80) in Bagalakote of Karnataka. In Uttarakannada district of Karnataka, Srinidhi breed recorded better body weight (2.17 kg/bird) but BCR (3.09) was better for CARI Nirbhik. In Idukki district of Kerala, Krishi Bro performed better with body weight of 1.45 kg/bird, but the BCR (1.81) was better for Kalinga Brown.

**(ii) Fodder varieties**

Five KVKs – Ballari, Yadgir, Bidar, Raichur and Kalaburagi -I in Hyderabad -Karnataka region have

tested four fodder varieties viz., NB-21, Co-3, Super Napier and Co-4 for yield maximization and results are presented in Table 34. Results revealed that the Super Napier performed better with yield ranging from 360.00 t/ha in Raichur to 396.00 t/ha in Yadgir. The next best yield was reported for Co-3 (270.00 t/ha) in Raichur.



Assessment of fodder varieties (KVK, Ballari)

**Table 33: Assessment of poultry breeds for backyard**

KVK	Poultry breed	Body weight/bird (Kg)	BCR
Bagalkot	Local birds	1.15	3.60
	Swarnadhara	2.85	4.80
	Kadaknath	1.30	1.39
Uttara Kannada	Local birds	1.12	-
	Srinidhi	2.17	2.68
	Gramapriya	1.98	3.04
	CARI-Nirbhik	1.68	3.09
Idukki	Local birds	1.29	1.46
	BV-380	1.41	1.51
	Kalinga Brown	1.40	1.81
	Krishi Bro	1.45	1.68

**Table 34: Assessment of fodder varieties**

Parameter	KVK	Fodder varieties			
		NB -21	Co-3	Super Napier	Co-4
Yield (t/ha/year)	Ballari	129.35	149.12	394.65	-
	Yadgir	247.32	-	396.00	266.00
	Bidar	120.00	180.00	390.00	-
	Raichur	218.00	270.00	360.00	-
	Kalaburagi-I	148.00	198.00	392.00	-
Net income (₹./ha)	Ballari	159025.00	183680.00	521975.00	-
	Yadgir	441440.00	-	738800.00	478800.00
	Bidar	23000.00	47000.00	130000.00	-
	Raichur	23000.00	27000.00	35000.00	-
	Kalaburagi-I	-	-	-	-
BCR	Ballari	5.11	5.20	7.89	-
	Yadgir	-	-	-	-
	Bidar	1.62	2.09	3.00	-
	Raichur	1.72	1.95	2.40	-
	Kalaburagi-I	3.20	3.47	6.05	-

**3.1.1.3 Enterprises**

**(a) State, enterprises and thematic area wise technology assessment**

Four KVKs-Belagavi-I, Shivamogga, Raichur and Vijayapura-II in Karnataka and three KVKs-Pathanamthitta, Kollam and Malapuram in Kerala have assessed technologies under five thematic areas viz., storage techniques, mechanization, health and nutrition, processing and value addition, and entrepreneurship development pertaining to enterprises and details are presented in Table 35. Data indicated that ten OFTs were conducted by seven KVKs to assess 15 technological options under various enterprises by involving 109 farmers in 19 locations.



Assessment of solar drying of red chilli (KVK, Raichur)

**Table 35: Technology assessment under enterprises by KVKs in Zone XI**

KVK	Thematic area	OFTs (No.)	Technology options (No.)	Farmers (No.)	Locations (No.)
<b>(a) Karnataka</b>					
Belagavi-I	Storage techniques	1	2	3	1
Shivamogga	Mechanization	1	1	5	1
Raichur	Mechanization	1	2	3	3
Vijayapura-II	Health and nutrition	1	1	5	1
<b>Total</b>		<b>4</b>	<b>6</b>	<b>16</b>	<b>6</b>
<b>(b) Kerala</b>					
Pathanamthitta	Processing and value addition	2	2	15	2
	Health and nutrition	1	2	50	6
Kollam	Processing and value addition	1	2	3	3
	Entrepreneurship development	1	2	15	1
Malappuram	Entrepreneurship development	1	1	10	1
<b>Total</b>		<b>6</b>	<b>9</b>	<b>93</b>	<b>13</b>
<b>Zone total (a + b)</b>		<b>10</b>	<b>15</b>	<b>109</b>	<b>19</b>

### 3.1.2 Frontline Demonstrations

Frontline demonstrations (FLDs) were conducted on field crops, horticulture crops, livestock and fisheries, farm implements and other allied enterprises to demonstrate the production potentials of newly released crop varieties, natural resource conservation technologies, crop production and protection technologies, improved technologies in livestock and fisheries and other enterprising activities. State and crop category wise details of FLDs conducted by KVKs in Zone XI are presented in Table 36. Data indicated that a total of 6337 FLDs were conducted which includes cereals and millets (1096), oilseeds (201), pulses (465), commercial crops (130), fiber crops (71), fodders (225), green manure (10), vegetables (472), tubers (61), fruits (243), flowers (40), plantations (75), spices (195), medicinal (10), hybrids (421), farm implements (154), livestock and fisheries (786) and enterprises (1682) in Karnataka, Kerala and Lakshadweep in 1308.92 ha and 2012 units of livestock and enterprises. Out of which, 4698 FLDs were conducted by KVKs of Karnataka in 1171.37 ha and 1288 units, 1608 FLDs by KVKs of Kerala in 137.51 ha and 706 units and 31 FLDs by KVK Lakshadweep in 18.03 ha.

#### 3.1.2.1 Cereals and Millets

A total of 1096 FLDs were conducted in various cereals and millets covering an area of 444.00 ha during the year by KVKs in Zone-XI. The state wise break up indicates

that the KVKs conducted 940 FLDs in Karnataka and 156 FLDs in Kerala (KVKs conducted (Table 36).

#### (a) Karnataka

A total of 940 FLDs were conducted by KVKs of Karnataka which includes paddy (358), wheat (20), maize (235), jowar (60), finger millet (165), little millet (10), foxtail millet (72) and bown top millet (20) in 370.50 ha of farmers' fields and results are presented in Table 37. Results indicated that paddy technologies such as ICM, INM, IPDM, IDM, IPM, reclamation of problematic soils, resource conservation technologies and improved varieties viz. GNV-10-89, RNE-15048, Gangavathi sona, Shyadri panchamuki, salt tolerant varieties GGV-05-01 and water management technologies gave an overall increase in grain yield of 14.27 per cent over checks. The BCR was higher due to adoption of IPDM technology (5.30) and IPM (3.04) with higher net returns. Highest yield of 95.03 q/ha was recorded with GNV-10-89 variety and lowest was 23.25 q/ha in red rice variety Shyadri Panchamuki. In wheat, an average of 31.72 q/ha grain yield was recorded due to ICM and varieties (UAS-304 and DDK 1029) as compared to 27.98 q/ha under check. Improved wheat variety UAS-304 has recorded 34.45q/ha under demonstration. IDM and IPDM in maize gave higher yield of 68.00 and 59.88 q/ha, respectively as compared to checks. However, BCR was higher with intercropping of maize with other crops (28.44). In rabi jowar, improved varieties viz., SPV-2217 and GS-23 and fall army worm management technologies gave an average

**Table 36: State-wise FLDs conducted by KVKs in Zone-XI**

Crop category	Karnataka		Kerala		Lakshadweep		Total	
	FLDs (No.)	Area (ha)	FLDs (No.)	Area (ha)	FLDs (No.)	Area (ha)	FLDs (No.)	Area (ha)
Cereals and millets	940	370.50	156	73.50	0	0	1096	444.00
Oilseeds	201	77.00	0	0.00	0	0	201	77.00
Pulses	465	170.20	0	0.00	0	0	465	170.20
Commercial	130	54.00	0	0.00	0	0	130	54.00
Fibers	71	28.40	0	0.00	0	0	71	28.40
Fodders	220	59.00	5	0.40	0	0	225	59.40
Green manures	10	4.00	0	0.00	0	0	10	4.00
Vegetables	368	121.45	102	12.85	2	0	472	134.30
Tubers	16	2.80	45	4.87	0	0	61	7.67
Fruits	173	65.90	67	7.04	3	0.03	243	72.97
Flowers	30	6.60	10	0.12	0	0	40	6.72
Plantations	46	17.00	29	6.94	0	0	75	23.94
Spices	86	21.42	109	3.67	0	0	195	25.09
Medicinal	10	4.00	0	0.00	0	0	10	4.00
Hybrids	421	125.90	0	0.00	0	0	421	125.90
Farm implements	106	43.20	48	28.12	0	0	154	71.32
Livestock and Fisheries (units)	441	444	335	310	10	10	786	764
Enterprises (units)	964	844	702	396	16	8	1682	1248
<b>Total</b>	<b>4698</b>	<b>1171.37 ha, 1288 units</b>	<b>1608</b>	<b>137.51 ha, 706 units</b>	<b>31</b>	<b>18.03</b>	<b>6337</b>	<b>1308.92 ha, 2012 units</b>

yield of 13.45 q/ha over checks (11.60 q/ha). Varietal demonstration in finger millet with KMR-360 gave an average yield of 30.47 q/ha as compared to 24.12 q/ha in check. Intercropping of foxtail millet in pigeonpea (1:2) gave higher net returns of ₹. 61780/ha as compared to

sole crop of pigeonpea (₹.14550/ha). Similarly, little millet under intercropping with pigeonpea gave 29.18 q/ha with higher net returns of ₹. 60660/ha. Brown top millet under ICM technology demonstration gave 16.57 q/ha with BCR of 2.56.

**Table 37: Frontline demonstrations conducted on cereals and millets by KVKs of Karnataka**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Paddy	ICM	6	70	28.80	53.67	40.48	33.25	68018	2.31	34544	1.73
	INM	3	50	20.00	59.50	54.88	9.00	64554	2.19	51732	1.93
	Reclamation of problematic soils	2	20	8.00	40.01	34.92	14.92	25870	1.96	13232	1.58
	IPDM	5	43	17.20	51.40	48.05	9.02	50628	5.30	31090	1.69
	IPM	2	15	6.00	56.42	49.68	16.50	66755	3.04	47153	2.32
	IDM	2	20	8.00	67.00	62.75	6.75	63825	2.50	41700	1.81
	Resource conservation	5	55	22.00	48.58	47.36	2.89	47978	2.43	33717	1.71
	Upland paddy	1	10	2.000	32.90	26.70	23.22	30167	2.13	18641	1.68
	GNV-10-89	1	10	4.00	95.03	73.34	29.57	84212	2.52	59885	1.85
	RNR-15048	1	10	4.00	65.80	76.83	-14.36	89660	2.63	66214	1.94
	Gangavathi Sona	1	5	2.00	52.00	41.50	25.30	60500	2.10	85800	16.60
	Salt tolerant variety GGV-05-01	1	10	4.00	86.97	72.45	20.04	84223	2.38	57624	1.81
	Shayadri Pancharuki	1	10	4.00	23.25	22.56	3.06	21847	1.89	15955	1.65
	Water management	2	30	12.00	77.60	70.00	10.78	77520	2.30	56330	1.84
		<b>Total</b>		<b>358</b>	<b>142.00</b>	<b>55.71</b>	<b>49.47</b>	<b>14.27</b>	<b>58586</b>	<b>2.80</b>	<b>39619</b>
Wheat	ICM	1	10	4.00	32.00	28.60	11.89	34600	2.18	22047	1.68
	UAS 304	1	5	2.00	34.45	31.20	10.42	74026	4.73	74026	4.73
	DDK-1029	1	5	2.00	28.70	24.15	18.84	63045	4.36	23303	2.30
	<b>Total</b>		<b>20</b>	<b>8.00</b>	<b>31.72</b>	<b>27.98</b>	<b>13.72</b>	<b>57224</b>	<b>3.76</b>	<b>39792</b>	<b>2.90</b>
Maize	ICM	2	15	6.00	54.02	46.87	16.06	41912	2.06	29717	1.62
	INM	3	25	10.00	51.36	46.37	11.87	48922	2.84	39236	2.52
	Pest management	7	65	25.00	51.49	45.47	13.16	40138	2.12	28534	1.75
	IPDM	2	15	6.00	59.88	51.85	15.36	45513	1.68	30223	1.43
	IDM	1	10	4.00	68.00	61.00	11.48	48700	2.05	31400	1.58
	Intercropping system	3	100	40.00	58.25	49.94	28.44	50883	2.20	24132	1.76
Popcorn	Cropping system	1	5	1.00	24.30	19.80	22.73	54350	1.99	26740	1.69
	<b>Total</b>		<b>235</b>	<b>92.00</b>	<b>54.52</b>	<b>48.09</b>	<b>15.96</b>	<b>44663</b>	<b>2.19</b>	<b>30062</b>	<b>1.82</b>
Rabi jowar	SPV-2217	3	40	16.00	13.58	11.75	15.45	24796	1.58	18982	2.07
	GS-23	1	10	4.00	13.50	11.80	14.41	29250	2.63	23300	2.29
	IPM	1	10	4.00	12.98	10.93	18.76	29419	2.16	21910	1.82
	<b>Total</b>		<b>60</b>	<b>24.00</b>	<b>13.45</b>	<b>11.60</b>	<b>15.90</b>	<b>26612</b>	<b>1.91</b>	<b>20431</b>	<b>2.07</b>

Finger millet	ICM	4	50	20.00	22.31	17.05	32.71	34390	2.10	22946	1.78
	ICM	3	20	5.50	27.87	25.03	12.55	54772	2.34	45838	2.49
	KMR 630	8	95	38.00	30.47	24.12	27.45	59460	4.79	38475	3.77
	<b>Total</b>		<b>165</b>	<b>63.50</b>	<b>28.44</b>	<b>22.42</b>	<b>17.07</b>	<b>47595</b>	<b>3.44</b>	<b>32125</b>	<b>2.85</b>
Foxtail millet	DHFt-109-3	4	30	12.00	9.80	7.98	25.10	14556	2.21	11850	2.14
	N 46	3	32	13.00	22.73	16.17	39.26	48226	4.70	27093	2.54
	Intercropping with Pigeonpea +	1	10	4.00	30.76	11.03	178.87	61780	3.90	14550	1.79
	<b>Total</b>		<b>72</b>	<b>29.00</b>	<b>15.34</b>	<b>11.43</b>	<b>49.63</b>	<b>33085</b>	<b>3.35</b>	<b>17904</b>	<b>2.24</b>
Brown top millet	ICM	2	20	8.00	16.57	13.76	19.20	30041	2.56	23420	2.24
Little millet	Intercropping with Pigeonpea +	1	10	4.00	29.18	11.43	155.29	60660	3.88	13690	1.75
	<b>Grand total</b>		<b>940</b>	<b>370.50</b>							

**Table 38: Frontline demonstrations on cereals conducted by KVKs of Kerala**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Paddy	ICM	2	16	5.00	44.03	37.13	20.07	41883	1.69	26381	1.45
	INM	2	9	4.20	71.12	57.05	25.90	96201	2.41	60356	1.89
	Sampoorna KAU mix using drone UAV	2	22	12.00	44.75	38.25	18.89	74400	2.45	53450	2.12
	Farm mechanization	1	3	10.00	32.00	15.00	113.33	42000	0.66	12000	0.78
	IPDM	5	45	16.60	51.71	39.44	33.76	72999	1.87	47838	1.59
	Organic farming	1	5	1.60	51.00	37.50	36.00	13499	3.22	39025	1.37
	Shreyas	2	22	8.00	67.25	46.50	45.45	97000	2.01	53250	1.52
	Lavanya (VTL-10)	1	3	0.50	45.00	41.50	8.43	116000	3.32	76000	2.52
	Manuratna	1	10	4.00	52.00	49.55	4.94	92000	2.96	96000	2.92
	<b>Total</b>		<b>144</b>	<b>69.90</b>	<b>52.52</b>	<b>41.10</b>	<b>32.48</b>	<b>68439</b>	<b>2.15</b>	<b>46239</b>	<b>1.73</b>
Finger millet	Crop production	1	4	1.20	18.13	14.44	26.21	21920	2.95	110700	2.93
Foxtail millet	Crop production	1	4	1.20	16.39	14.17	15.66	25609	3.77	15061	2.16
Little millet	Crop production	1	4	1.20	10.65	9.00	18.31	16288	4.22	18616	2.72
	<b>Grand total</b>		<b>156</b>	<b>73.50</b>							

### **(b) Kerala**

A total of 156 FLDs were conducted by KVKs of Kerala which includes paddy (144), finger millet (4), foxtail millet (4) and little millet (4) in 73.50 ha of farmers' fields and results are presented in Table 38. Results indicated that technologies such as ICM, INM, IPDM, organic cultivation and varieties such as Shreyas, VTL-10 and Manuratna gave on an average 52.52 q/ha yield

as compared to check (41.10 q/ha). Highest yield was recorded under INM (71.12 q/ha) followed by high yielding variety Shreyas (67.25 q/ha). Using drone UAV Sampoorna KAU mix was sprayed in paddy for the first time which gave encouraging results of increased yield and net returns.



IPDM in paddy (KVK, Shivamogga)



Pheromone traps in maize (KVK, Chikkaballapur)



Foxtail millet variety DHFt 109-3 (KVK, Dharwad)



Paddy variety Manuratna (KVK, Kollam)

**3.1.2.2 Oilseeds**

A total of 201 FLDs under oilseeds by KVKs of Karnataka which included groundnut (95), sunflower (12), safflower (5), linseed (5), sesamum (22) and soybean (62) were demonstrated in 77.00 ha of farmers' fields and results are presented in Table 39. Results revealed that the groundnut crop performed better under ICM, IPDM, INM and improved varieties by recording an increased average yield of 21.33 q/ha as compared to

check (17.71q/ha). Highest yield of 28.20 q/ha was recorded by variety Dh-256, higher than check by 22.98 per cent. Demonstration of sunflower under ICM gave a net profit of ₹.38542/ha. Demonstration of soybean variety DSB-23, IPDM and INM resulted in higher yield of 15.41q/ha over check (13.04q/ha). This also led to higher net returns of ₹. 37871/ha as compared to only ₹. 28512/ha under check.



Method demonstration on seed treatment in groundnut (KVK, Bagalkot)



Field day on groundnut (KVK, Chitradurga)

**Table 39: Frontline demonstrations on oilseeds conducted by KVKs of Karnataka**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Groundnut	ICM	3	25	9.00	19.17	15.50	26.02	85946	3.04	58336	2.43
	IPDM	3	30	12.00	24.62	20.92	17.56	71054	2.52	48585	1.99
	INM	2	30	12.00	16.20	13.63	19.04	40306	1.86	29613	1.67
	Dh 256	1	10	4.00	28.20	22.93	22.98	69880	2.44	47725	1.98
	<b>Total</b>		<b>95</b>	<b>36.00</b>	<b>21.33</b>	<b>17.71</b>	<b>21.31</b>	<b>69054</b>	<b>2.54</b>	<b>47524</b>	<b>2.06</b>
Sunflower	ICM	1	12	5.00	18.66	14.53	28.42	38542	3.21	27905	2.78
Linseed	Intercropping	1	5	2.00	7.50	6.80	9.33	16700	2.13	14560	2.04
Safflower	PBNS-12	1	5	2.00	15.00	13.95	7.53	46750	2.50	36800	2.25
Sesame	ICM	1	10	2.00	3.08	4.14	-25.60	3715	1.17	9846	1.49
	IDM	1	12	5.00	7.50	6.50	15.38	35890	3.87	30530	3.68
	<b>Total</b>		<b>22</b>	<b>7.00</b>	<b>5.29</b>	<b>5.32</b>	<b>-5.11</b>	<b>19803</b>	<b>2.52</b>	<b>20188</b>	<b>2.58</b>
Soybean	DSB-21	1	10	4.00	22.33	19.11	16.85	58586	2.91	44956	2.43
	IPDM										
	INM	3	27	11.00	13.48	11.72	16.21	30464	2.50	24050	2.08
		3	25	10.00	15.04	12.33	19.53	38373	2.08	27492	1.83
	<b>Total</b>		<b>62</b>	<b>25.00</b>	<b>15.41</b>	<b>13.04</b>	<b>17.72</b>	<b>37871</b>	<b>2.38</b>	<b>28512</b>	<b>2.02</b>
	<b>Grand Total</b>		<b>201</b>	<b>77.00</b>							



IPDM in soybean (KVK, Belagavi-II)



Groundnut collar rot disease management (KVK, Kalaburgi - II)

### 3.1.2.3 Pulses

A total of 465 FLDs were conducted under pulses by KVKs of Karnataka which included pigeonpea (242), greengram (47), blackgram (22), horsegram (21), dolichos (avare) (10), rice bean (5) and chickpea (118) in 170.20 ha area of farmers' fields and results are presented in Table 40. Results indicated that intercropping of pigeonpea with maize has recorded highest yield of 22.34 q/ha, which was followed by variety GRG-152 (15.65 q/ha). In greengram, variety BGS-9 gave highest yield of 8.00 q/ha as compared to check (6.47 q/ha). In blackgram, overall yield increase was 65.63 per cent due to ICM and variety LBG-791 over check, wherein ICM recorded yield of 14.81 q/ha. Demonstration in horsegram recorded 5.07 q/ha as a contingent crop for late sowing. During *rabi* season, varietal demonstration, ICM and IPDM in chickpea gave an average yield increase of 19.31 per cent over their checks. Highest yield of 14.70 q/ha was recorded in ICM followed by 14.52 q/ha in IPDM. Introduction of rice bean variety KBR-1 gave higher yield of 15.40q/ha with net profit of ₹. 41000/ha. Dolichos (Avare) as an intercrop with INM gave 7.13 q/ha as compared to check (5.78 q/ha).

**Table 40: Frontline demonstrations on pulses conducted by KVKs of Karnataka**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Greengram	ICM	1	5	2.00	7.10	5.30	33.96	26126	2.60	18034	2.29
	DGGV-2	2	20	8.00	5.85	4.41	32.68	10575	2.13	5702	1.72
	BGS-9	2	22	9.00	8.00	6.47	27.07	23660	2.44	13188	1.95
	<b>Total</b>		<b>47</b>	<b>19.00</b>	<b>6.96</b>	<b>5.41</b>	<b>30.69</b>	<b>18919</b>	<b>2.35</b>	<b>11162</b>	<b>1.93</b>
Blackgram	LBG-791	1	10	4.00	7.40	3.78	95.77	22286	1.91	-1224	0.94
	ICM	1	12	5.00	14.81	10.93	35.50	65984	5.26	44891	3.94
	<b>Total</b>		<b>22</b>	<b>9.00</b>	<b>11.11</b>	<b>7.36</b>	<b>65.63</b>	<b>44135</b>	<b>3.58</b>	<b>21834</b>	<b>2.44</b>
Dolichos (Avare) Pigeonpea	Nutrient management	1	10	4.00	7.13	5.78	23.36	86075	2.01	64575	1.87
	ICM	4	159	51.00	12.58	10.12	25.25	34380	2.10	21647	1.69
	BRG-4	1	10	2.00	13.10	12.05	8.71	52184	2.22	41448	2.00
	BRG-5	1	10	4.00	15.06	12.43	21.16	64680	3.24	52509	2.99
	TS 3R	1	3	1.20	9.52	7.70	23.64	28650	2.63	38820	3.12
	GRG-152	1	10	4.00	15.65	12.70	23.72	26240	1.35	30320	1.59
	IPM	1	10	4.00	11.15	10.45	6.70	49860	3.32	38124	2.33
	Solar operated nipping machine	1	10	4.00	13.00	11.00	18.18	40640	2.67	31700	2.36
	Intercropping	3	30	10.00	22.34	18.72	17.74	64830	2.85	43194	2.20
	<b>Total</b>			<b>242</b>	<b>80.20</b>	<b>14.99</b>	<b>12.53</b>	<b>19.72</b>	<b>45713</b>	<b>2.49</b>	<b>34545</b>
Horsegram	Seed Production	1	11	4.00	5.08	4.27	18.97	133620	13.59	3260	1.34
	Crop Production	1	10	2.00	5.06	4.35	16.32	9162	3.04	7245	2.61
	<b>Total</b>		<b>21</b>	<b>6.00</b>	<b>5.07</b>	<b>4.31</b>	<b>17.65</b>	<b>71391</b>	<b>8.32</b>	<b>5253</b>	<b>1.98</b>
Rice bean	KBR-1	1	5	2.00	15.40	-	-	41000	2.14	-	-
Chickpea	ICM	3	58	26.00	14.70	11.47	29.29	38860	2.21	15852	1.77
	IPDM	5	45	18.00	14.52	12.91	13.23	40018	2.83	29565	2.18
	JAKI-9218	1	10	4.00	14.03	10.98	27.78	26566	1.86	16650	1.59
	JG-14	1	5	2.00	12.80	11.50	11.30	31175	2.00	25081	1.80
	<b>Total</b>			<b>118</b>	<b>50.00</b>	<b>14.35</b>	<b>12.14</b>	<b>19.31</b>	<b>37441</b>	<b>2.47</b>	<b>23711</b>
<b>Grand total</b>			<b>465</b>	<b>170.20</b>							



Greengram variety DGGV-2 (KVK, Gadag)



IPDM in chickpea (KVK, Raichur)

### 3.1.2.4 Commercial crops

A total of 130 FLDs were conducted under commercial crops by KVKs of Karnataka which included mulberry (50) and sugarcane (80) in 54.00 ha of farmers' fields and results are presented in Table 41. Results indicated that ICM, IPM and soil fertility management in sugarcane recorded an average yield of 1083.08q/ha and BCR of 2.69 as compared to 935.81 q/ha cane yield and BCR of 2.38 under check. In mulberry, results revealed that mulberry leaf yield increased by 12.59 per cent due to INM and IPM with higher net return (₹. 75067/ha) and BCR (2.61) as compared to check.



FLD on sugarcane (KVK, Vijayapura-I)



INM in sugarcane (KVK, Belagavi - II)

### 3.1.2.5 Fiber crops

A total of 71 FLDs were conducted under fiber crop, cotton by KVKs of Karnataka in 28.40 ha of farmers' fields and results are presented in Table 42. Results showed that the seed cotton yield was 20.05 q/ha and 22.49 q/ha, respectively leading to 28.43 per cent and 43.13 per cent increase in yield in IPDM and intercropping as compared to checks, respectively.

### 3.1.2.6 Fodder crops

A total of 225 FLDs were conducted by KVKs in the Zone on fodder crops in 59.40 ha. State and technology wise results are presented below.

Table 41: Frontline demonstrations on commercial crop cotton conducted by KVKs of Karnataka

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	(% Increase)	Demo		Check	
								Net return	BCR	Net return	BCR
Mulberry (yield per cutting)	INM	4	30	12.00	116.20	99.80	16.40	43473	2.65	45672	2.56
	Foliar nutrition	1	10	5.00	102.51	97.48	5.16	152844	2.66	119156	1.35
	IPM	1	10	5.00	98.85	94.35	4.77	123662	2.39	84915	2.13
	<b>Total</b>		<b>50</b>	<b>22.00</b>	<b>105.85</b>	<b>97.21</b>	<b>8.78</b>	<b>106660</b>	<b>2.57</b>	<b>83248</b>	<b>2.01</b>
Sugarcane	ICM	1	10	4.00	1035.00	965.50	7.20	90500	1.41	64650	1.31
	IPM	2	20	8.0	1097.30	975.25	12.48	149657	2.38	112319	1.97
	Soil fertility management	4	40	16.00	1324.38	1111.48	18.62	205682	2.88	158243	2.44
	Natural resource management	1	10	4.00	137.50	124.60	10.35	254642	3.86	233436	4.02
<b>Grand total</b>	<b>Total</b>		<b>80</b>	<b>32.00</b>	<b>1083.08</b>	<b>935.81</b>	<b>14.62</b>	<b>183398</b>	<b>2.69</b>	<b>144462</b>	<b>2.38</b>
			<b>130</b>	<b>54.00</b>							

Table 42: Frontline demonstrations on fiber crops conducted by KVKs of Karnataka

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Cotton	IPDM	4	36	14.4	20.05	15.78	28.43	72498	3.29	47067	2.38
	Intercropping	3	35	14	22.49	15.68	43.13	17888	1.33	14490	1.29
	<b>Total</b>		<b>71</b>	<b>28.4</b>	<b>21.09</b>	<b>15.74</b>	<b>34.73</b>	<b>49094</b>	<b>2.45</b>	<b>33105</b>	<b>1.91</b>



IPDM in cotton (KVK, Yadagir)



FLD cotton (KVK, Davanagere)

**(b) Kerala**

A total of five FLDs were conducted by one KVK of Kerala on fodder production technology with Guinea grass, CO(GG)-3 covering an area of 0.40 ha. Results indicated that fodder yield increased to the extent of 15.52 percent in demo (guinea grass) with an average green fodder yield of 2560.00 q/ha/year as against check (2216.00 q/ha). Further, demo gave net return of ₹.373450/ha with BCR of 2.40 as against check net return (₹.297450/ha) and BCR (2.16).



Hedge lucerne (KVK, Haveri)

**(a) Karnataka**

A total of 220 FLDs were conducted under different fodders by KVKs of Karnataka which included fodder crops (160), fodder sorghum (40), tree fodder (10) and mixed fodder crops (10) in 59.00 ha of farmers' fields and results are presented in Table 43. Results revealed that the average green fodder yield under demonstrations was 1364.65/ha with average net profit of ₹. 108055/ha. In CoFS-29, seed production gave more net profit than the green fodder production.



Fodder sorghum variety-CoFS-31 (KVK, Raichur)

**Table 43: Frontline demonstrations on fodder crops conducted by KVKs of Karnataka**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Fodder crops	ICM	12	140	39.50	1220.38	836.94	53.90	120143	3.47	65483	2.70
	Styloxanthus	1	10	2.00	18.00	-	-	10000	2.25	0	-
Fodder sorghum	Seed production- (CoFS-29)	1	10	4.00	7.25	510.00	-	230000	4.83	154000	4.08
	CoFS-31	3	40	7.50	2426.67	1395.00	96.67	61063	2.82	29534	1.88
Tree fodder	Fodder tree for forages	1	10	4.00	127.50	70.00	82.14	163500	2.79	68000	1.94
Mixed fodder crops	Hedge Lucerne	1	10	2.00	400.00	-	-	24650	2.61	-	-
<b>Total</b>			<b>220</b>	<b>59.00</b>	<b>1364.65</b>	<b>1005.02</b>	<b>62.42</b>	<b>108055</b>	<b>3.29</b>	<b>57705</b>	<b>2.58</b>

### 3.1.2.7 Green manure crops

One KVK in Karnataka conducted 10 FLDs on green manure crops viz., diancha and pillepesara as a part of NRM technology in 4.00 ha of farmers' fields that resulted high green manure yield of 83.92 q/ha as compared to check (78.55 q/ha) which is 6.84 per cent higher yield over check. Further, demonstration gave a net return of ₹. 93742/ha with BCR of 2.70 as against lower net return (₹.65446/ha) and BCR (1.88) in the check.

### 3.1.2.8 Vegetable crops

A total of 472 FLDs were conducted by the KVKs of Karnataka, Kerala and Lakshadweep under 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 and vegetable cowpea with improved varieties and production technologies in 134.30 ha of farmers' fields. State wise and technology wise results are presented below:

#### (a) Karnataka

A total of 368 FLDs were conducted under vegetables by KVKs of Karnataka which includes amaranthus (10), okra (25), brinjal (5), cabbage (10), capsicum (10), chilli (19), cluster bean (5), cucumber (5), dolichos bean (20), greenpea (5), french bean (50), onion (94), pole bean (15), radish (5), ridgegourd (5), spine gourd (5), tomato (70) and yardlong bean (10) in 121.45 ha of farmers' fields and results are presented in Table 44. Results indicated that cultivation of amaranthus variety Arka Suguna recorded 42.59 per cent increased green leaf yield (192.50 q/ha) with BCR of 4.81 as compared to check. In bhendi, technologies such as ICM and improved variety Arka Nikita led to an average yield of 124.65 q/ha as compared to 111.28q/ha in check. ICM technology in brinjal gave a yield of 319.50q/ha with BCR of 7.43. Similarly, ICM in cabbage, capsicum and chilli also recorded 14.50 per cent, 22.05 per cent and 14.90 per cent yield increased with higher net profits over check.

Cluster bean variety Pusa Navbahar recorded 85.80q/ha as compared to check with only 52.40q/ha. Cucumber under organic farming recorded 608.80q/ha with net profit of ₹. 87290/ha as compared to check with only ₹.66240/ha. In dolichos, varieties HA-4 and Arka Amogh recorded 53.86 q/ha and 74.50 q/ha, respectively. Green pea variety Arka Sampoorna gave 126.58 per cent higher yield (971.60q/ha) as compared to check. In french bean, ICM technology recorded 144.68q/ha bean yield as compared to check (122.58q/ha). French bean intercropping in coconut and arecanut plantation gave 64.71q/ha bean yield in addition to main crop yield. In onion, demonstrated varieties and production

technologies gave higher yield ranging from 1.17 per cent to 37.73 per cent over check. Further, ICM practice in onion has given highest yield of 303.29 q/ha with BCR of 3.22 as compared to 220.06 q/ha in check. Onion variety Bhima shakti recorded higher yield of 290.00 q/ha as compared to check (261.00 q/ha) and Co-5 in small onion gave higher yield of 86.70 q/ha as compared to check (85.70 q/ha). In pole bean, ICM and disease management technologies have led to increased yield to the tune of 15.78 per cent over their local checks. Radish variety Arka Nishant yielded 236.00 q/ha as compared to check (162.30 q/ha). Ridge gourd variety Arka Prasanna and spine gourd variety Arka Neelachal Shanti gave 65.00 q/ha and 78.50 q/ha, respectively under demonstrations. In tomato, ICM, INM, IPDM technologies resulted an increased yield on an average by 13.54 per cent over check. Highest tomato yield of 671.20 q/ha was recorded in ICM followed by IPDM (416.46 q/ha) and INM (251.12 q/ha). Yard long bean variety Arka Mangala gave yield of 211.57 q/ha over check (161.30 q/ha).



Integrated crop management in tomato (KVK, Raichur)



Integrated crop management in cabbage (KVK, Balagavi-II)

**Table 44: Frontline demonstrations on vegetable crops conducted by KVKs of Karnataka**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Amaranthus	Arka Suguna	1	10	4.00	192.50	135.00	42.59	228750	4.81	152500	4.05
Okra	ICM	1	10	4.00	87.60	73.60	19.02	52900	2.01	39060	1.79
	Arka Nikita	2	15	3.00	143.18	130.13	10.71	212850	3.82	192750	3.82
	<b>Total</b>		<b>25</b>	<b>7.00</b>	<b>124.65</b>	<b>111.28</b>	<b>13.48</b>	<b>159533</b>	<b>3.22</b>	<b>141520</b>	<b>3.14</b>
Brinjal	ICM	1	5	1.00	319.50	297.40	7.43	319427	4.34	263883	3.84
Cabbage	ICM	2	10	3.00	314.90	274.80	14.50	229365	3.21	169340	2.55
Capsicum	ICM	1	10	4.00	362.60	297.10	22.05	390896	4.35	291182	3.33
Chilli	ICM	4	19	8.40	225.66	193.58	14.90	364622	3.63	330734	3.42
Cluster bean	Pusa Navbahar	1	5	1.00	85.80	52.40	63.74	156500	3.7	73000	2.26
Cucumber	Organic farming	1	5	2.00	608.80	536.30	13.52	87290	2.13	66241	1.9
Dolichos bean	HA-4	2	15	6.00	53.86	52.78	5.02	78583	3.41	124071	4.05
	ArkaAmogh	1	5	2.00	74.50	58.50	27.35	104200	3.33	74350	2.74
	<b>Total</b>		<b>20</b>	<b>8.00</b>	<b>60.74</b>	<b>54.69</b>	<b>12.46</b>	<b>87122</b>	<b>3.38</b>	<b>107497</b>	<b>3.62</b>
Greenpea	Arka Sampoorana	1	5	2.00	71.60	31.60	126.58	169800	4.77	54800	2.37
French bean	ICM	4	35	12.00	144.68	122.58	22.20	207695	3.87	150406	2.88
	Inter cropping	2	15	4.00	64.71	0.00		133852	3.17		
	<b>Total</b>		<b>50</b>	<b>16.00</b>	<b>121.83</b>	<b>102.15</b>	<b>22.20</b>	<b>186597</b>	<b>3.67</b>	<b>119454</b>	<b>2.88</b>
Onion	ICM	4	48	14.50	303.29	220.06	37.73	221240	3.22	142423	2.74
	Bhima Super	1	10	4.00	149.10	136.00	9.63	386480	7.35	317800	6.04
	Bhima Shakti	1	6	2.40	290.00	261.00	11.11	159340	5.18	120860	3.95
	Weed management	1	10	4.00	43.50	32.00	35.94	102488	2.43	49213	1.62
	IWM	1	10	4.00	113.70	83.11	36.81	158750	3.31	109210	2.42
	IDM	1	5	2.00	108.25	86.51	25.13	90375	2.26	52765	1.69
Small onion	Co-5	1	5	2.00	86.70	85.70	1.17	188450	3.63	160920	2.67
	<b>Total</b>		<b>94</b>	<b>32.90</b>	<b>200.44</b>	<b>156.46</b>	<b>27.07</b>	<b>197084</b>	<b>3.71</b>	<b>138046</b>	<b>2.93</b>
Pole bean	ICM	1	5	2.00	363.60	315.21	15.35	579940	4.94	421888	3.02
	Disease Management	2	10	2.00	264.86	230.75	15.99	410014	3.81	377408	3.5
	<b>Total</b>		<b>15</b>	<b>4.00</b>	<b>297.77</b>	<b>258.90</b>	<b>15.78</b>	<b>466656</b>	<b>4.19</b>	<b>392234</b>	<b>3.34</b>
Radish	Arka Nishant	1	5	0.50	236.00	162.30	45.41	83000	2.51	35000	1.64
Ridgegourd	Arka Prasanna	1	5	3.00	65.00	52.50	23.81	97720	3.52	74110	3.05
Spine gourd	Arka Neelanchal Shanthi	1	5	0.25	78.50	49.25	59.39	183550	2.41	78765	1.67
Tomato	ICM	1	5	1.00	671.20	614.30	9.26	599561	3.92	460890	3.13
	IPDM	4	45	16.00	416.46	370.04	15.26	327292	3.34	250469	2.68
	INM	3	20	6.40	251.12	214.46	12.68	276740	3.82	217171	3.32
	<b>Total</b>		<b>70</b>	<b>23.40</b>	<b>386.30</b>	<b>342.23</b>	<b>13.54</b>	<b>342369</b>	<b>3.59</b>	<b>264285</b>	<b>2.97</b>
Yardlong bean	ArkaMangala	1	10	1.00	211.57	161.30	31.17	303140	3.53	207650	2.81
	<b>Grand total</b>		<b>368</b>	<b>121.45</b>							

**(b) Kerala**

A total of 102 FLDs were conducted under vegetables by KVKs of Kerala which includes amaranthus (10), ridge gourd (7), bitter gourd (5), cabbage (5), cucurbits (15), pepino (5), tomato (10) and vegetable cowpea (50) in 12.85 ha mostly in the homestead farming situation of farmers and results are presented in Table 45. Results showed that amaranthus variety Vaika recorded a green

leaf yield of 220.00 q/ha as compared to check (190.00 q/ha).

Crop production technology in ridge gourd gave 140 per cent higher yield of 72.00 q/ha as compared to only 30.00 q/ha in check. IPDM in bitter gourd gave 85.60q/ha as compared to check (67.20 q/ha). In cabbage, INM gave 596.00 q/ha as compared to check (376.00 q/ha). Disease management in cucurbits led to

39.53 per cent increased yield (366.00 q/ha) over check. ICM in tomato gave yield of 365.67 q/ha with net profit of ₹. 251614/ha. In vegetable cowpea, ICM, INM, IPDM and variety Deepika gave increased yield ranging from 9.71 per cent to 30.00 per cent over their local check. Highest yield of 192.00 q/ha was recorded under ICM. Variety Deepika resulted in negative net profit due to flood caused by heavy rainfall during harvest stage.

**(c) Lakshadweep**

Two FLDs were conducted by KVK, Lakshadweep, one each on tomato and brinjal with wick irrigation for terrace cultivation of vegetables in homestead situation of Lakshadweep Islands. Tomato variety Lakshmi gave yield of 444.00 q/ha and brinjal variety NO-183 gave yield of 392 q/ha.

**Table 45: Frontline demonstrations on vegetable crops conducted by KVKs of Kerala**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Amaranthus	Vaika	1	10	0.08	220.00	190.00	15.79	280000	2.04	215000	1.83
Ridge gourd	Crop production	1	7	0.04	72.00	30.00	140.00	75000	1.50	62000	1.83
Bitter gourd	IPDM	1	5	2.00	85.60	67.20	27.38	205400	2.27	78200	1.50
Cabbage	INM	1	5	2.00	596.00	376.00	58.51	238200	2.99	112380	1.99
Cucurbits	Disease management	2	15	0.13	366.00	269.00	40.00	666000	2.08	525000	2.24
Tomato	ICM	1	10	0.50	365.67	296.02	23.53	251614	1.97	154104	1.59
Vegetable cowpea	INM	1	5	1.00	130.00	100.00	30.00	173000	2.99	111000	2.25
	IPDM	4	25	6.70	141.79	110.48	26.24	370418	2.89	215705	2.15
	ICM	1	10	0.20	192.00	175.00	9.71	413000	2.16	345000	1.97
	Deepika	1	10	0.20	21.40	17.60	21.59	-535000		-364000	
<b>Total</b>			<b>50</b>	<b>8.10</b>	<b>130.08</b>	<b>104.93</b>	<b>23.75</b>	<b>218953</b>	<b>2.45</b>	<b>136403</b>	<b>1.91</b>
<b>Grand total</b>			<b>102</b>	<b>12.85</b>							

\*affected by flood.



ICM in cabbage (KVK, Belagavi-II)



ICM in tomato (KVK, Davanagere)



Chilli murda complex disease management (KVK, Kalaburagi-II)



IDM in pole bean (KVK, Ramanagara)



Disease management in cucurbits (KVK, Kottayam)



Amaranthus variety Vaika (KVK, Kottayam)

### 3.1.2.9 Tuber crops

A total of 61 FLDs were conducted by KVKs of Zone XI on major tuber crops like potato, cassava, sweet potato and lesser yam covering an area of 7.67 ha and results are presented in Table 46. State and technology wise results are discussed below:

#### (a) Karnataka

A total of 16 FLDs were conducted on nutrient

management and ICM technologies in potato covering an area of 2.80 ha by two KVKs of Karnataka. Results indicated that demonstrated technologies out yielded its check to the extent of 20.06 per cent. Tuber yield obtained with nutrient management technology was highest with 165.50 q/ha as compared to 110.30 q/ha in ICM technology (Table 46).

#### (b) Kerala

A total of 45 FLDs were conducted by five KVKs of Kerala on tuber crops which includes cassava (25), sweet potato (10) and lesser yam (10) in 4.87 ha of farmers' fields. Results revealed that INM, ICM and IPM in cassava gave higher average yield of 280.33q/ha, and net return of ₹. 336075/ha as compared 205.00 q/ha and net returns of ₹. 191464/ha in check. ICM in sweet potato gave 165.00 q/ha tuber yield and net profit of ₹. 205000 /ha. In lesser yam, crop production technology resulted in 11.10 per cent higher yield of 175.00 q/ha over check (157.50 q/ha) (Table 46).



FLD on potato (KVK, Hassan)

**Table 46: Frontline demonstrations on tuber crops conducted by KVKs in Zone XI**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
<b>(a)Karnataka</b>											
Potato	Nutrient management	1	6								
	ICM	1	10	0.80	165.50	139.50	18.64	126480	3.42	98800	2.72
	<b>Total (a)</b>		<b>16</b>	<b>2.80</b>	<b>137.90</b>	<b>115.15</b>	<b>20.06</b>	<b>135516</b>	<b>3.91</b>	<b>101593</b>	<b>2.93</b>
<b>(b) Kerala</b>											
Cassava	INM	1	10	0.30	297.00	220.00	35.00	285589	2.22	156905	1.69
	ICM	1	5	0.25	312.00	264.00	18.18	436048	3.32	349280	2.95
	IPM	1	10	4.00	232.00	131.00	77.10	286588	1.70	68206	1.21
	<b>Total</b>		<b>25</b>	<b>4.55</b>	<b>280.33</b>	<b>205.00</b>	<b>43.43</b>	<b>336075</b>	<b>2.41</b>	<b>191464</b>	<b>1.95</b>
Sweet potato	ICM	1	10	0.12	165.00	136.00	21.32	205000	1.71	118000	1.41
Lesser yam	Crop production	1	10	0.20	175.00	157.50	11.11	222640	1.96	187240	1.84
	<b>Total (b)</b>		<b>45</b>	<b>4.87</b>							
	<b>Grand total</b>		<b>61</b>	<b>7.67</b>							



INM in cassava (KVK, Alappuzha)



Sweet potato (KVK, Malappuram)

**3.1.2.10 Fruit crops**

A total of 240 FLDs were conducted by KVKs of Zone XI on major fruit crops like banana, grapes, lime,

mango, papaya pomegranate, coorg mandarin, straw berry and guava covering an area of 72.94 ha. State and technology wise results are presented below:

**(a) Karnataka**

A total of 173 FLDs were conducted by KVKs of Karnataka on fruit crops which includes banana (30), grape (15), guava (10), coorg mandarin (5), lime (27), mango (27), papaya (5), pomegranate (28) and water melon (26) in 65.90 ha of farmers' fields and results are presented in Table 47. Results indicated that banana variety G-9 with IDM registered highest yield of 747.50 q/ha followed by 362.20 q/ha in *yelakki* with higher economic return as compared to their checks. In grapes, disease management gave 374.50 q/ha yield as compared to check (339.00 q/ha). INM in guava gave 22.94 per cent higher yield (209.00 q/ha) over check. ICM in Coorg mandarin resulted in 15.56 per cent higher yield of 153.70 q/ha over check. In lime, ICM and IDM gave yield of 235.00 and 141.00 q/ha, respectively leading to higher net profits as compared to check. ICM in mango and papaya gave yield of 135.60 q/ha and 750.00 q/ha, respectively. In pomegranate, IDM and organic farming proved superior by recording higher yield than checks. Average yield under demonstrations in pomegranate was 53.33 q/ha as compared to 44.54 q/ha in check. In watermelons, IDM and INM improved the yield by 32.56 per cent over check leading to higher net profits.

**Table 47: Frontline demonstrations on fruit crops conducted by KVKs of Karnataka**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Banana	ICM in Elakki	1	5	1.00	362.20	295.60	22.53	864700	4.90	627000	3.41
	Nutrient management	1	10	4.00	141.50	104.50	35.41	467350	2.57	286950	2.28
		1	5	2.00	747.50	632.50	18.18	571703	6.32	458535	5.14
	IDM	2	10	3.00	239.27	218.77	10.11	495063	3.24	442846	3.04
	<b>Total</b>		<b>30</b>	<b>10.00</b>	<b>345.95</b>	<b>294.03</b>	<b>19.27</b>	<b>578776</b>	<b>4.05</b>	<b>451636</b>	<b>3.38</b>
Grape	Disease management	2	15	6.00	374.50	339.00	10.24	1081365	4.20	933440	3.79
Guava	INM	1	10	4.00	209.00	170.00	22.94	335440	6.73	265230	5.80
Coorg mandarin	ICM	1	5	1.00	153.70	133.00	15.56	101982	2.24	85752	2.16
Lime	ICM	1	5	2.00	235.00	175.00	34.29	196710	5.14	150914	4.00
	IDM	2	22	9.00	141.00	111.00	28.10	92938	3.29	60543	2.36
	<b>Total</b>		<b>27</b>	<b>11.00</b>	<b>172.53</b>	<b>132.33</b>	<b>30.32</b>	<b>127528</b>	<b>3.91</b>	<b>90666</b>	<b>2.91</b>
Mango	ICM	3	27	11.00	135.60	108.93	27.19	240533	5.10	180613	4.15
Papaya	ICM	1	5	2.00	750.00	465.00	61.29	345000	4.29	199000	3.49
Pomegranate	Organic farming	2	8	2.50	54.73	48.10	11.26	738038	4.82	825013	3.91
	IDM	3	20	8.00	52.39	42.17	21.18	546600	4.95	410620	4.02
	<b>Total</b>		<b>28</b>	<b>10.50</b>	<b>53.33</b>	<b>44.54</b>	<b>17.21</b>	<b>623175</b>	<b>4.90</b>	<b>576377</b>	<b>3.98</b>
Watermelon	INM	3	21	8.40	558.00	405.00	37.00	293667	4.15	195383	3.33
	IDM	1	5	2.00	622.70	516.90	20.47	180600	3.65	144000	3.31
	<b>Total</b>		<b>26</b>	<b>10.40</b>	<b>574.43</b>	<b>432.98</b>	<b>32.56</b>	<b>265400</b>	<b>4.02</b>	<b>182538</b>	<b>3.33</b>
	<b>Grand total</b>		<b>173</b>	<b>65.90</b>							

**(b) Kerala**

A total of 67 FLDs were conducted by KVKs of Kerala on fruit crops which includes banana (56), mango (6) and straw berry (5) in 7.04 ha of farmers' fields and results are presented in Table 48. Results shows that the disease management and INM in Nendran banana have performed better with an average yield of 353.99 q/ha as against their local checks (277.78 q/ha). INM in Nendran banana alone gave 392.00 q/ha fruit yield as compared to 286.00 q/ha with check. IPDM in mango gave 12.50 per cent higher yield of 180.00 q/ha. A new fruit crop, straw berry gave 300.00 q/ha fruit yield with higher net profit of ₹.842500/ha.

**(c) Lakshadweep**

Three FLDs were conducted by KVK, Lakshadweep on micro nutrient management in Nendran banana though AYAR application in homesteads of Lakshadweep Islands in 0.03 ha. Result indicated that demonstration gave 30.00 per cent more yield (149.00 q/ha) in comparison to check (105.00q/ha). Further, demonstration gave more net return ( ₹.363/plant) and BCR (1.40) as compared to check with net return (₹.198/plant) and BCR (0.44).



FLD on pomegranate (KVK, Tumkur-II)



FLD on banana (KVK, Alappuzha)



ICM in mango (KVK, Ramanagara)

**3.1.2.11 Plantation crops**

A total of 75 FLDs were undertaken by KVKs of Zone XI on major plantations like arecanut, coconut and coffee covering an area of 23.94 ha and results are presented in Table 49. State and technology wise results are discussed below:

**(a) Karnataka**

A total of 46 FLDs (Table 49) were conducted by eight KVKs of Karnataka on plantation crops which includes arecanut (36) and coffee (10) in 17.00 ha of farmers'

**Table 48: Frontline demonstrations on fruit crops conducted by KVKs of Kerala**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Banana Nendran	Disease management	5	40	1.84	323.00	271.00	20.00	320636	1.75	180082	1.40
	INM	4	16	2.60	392.00	286.00	38.00	348768	2.01	187000	1.64
	<b>Total</b>		<b>56</b>	<b>4.44</b>	<b>353.99</b>	<b>277.78</b>	<b>28.43</b>	<b>333139</b>	<b>1.87</b>	<b>183157</b>	<b>1.51</b>
Mango	IPDM	1	6	2.40	180.00	160.00	12.50	4000	1.08	11000	1.17
Strawberry	Winterdawn	1	5	0.20	300.00			842500	3.36	0	
<b>Grand total</b>			<b>67</b>	<b>7.04</b>							

fields. Results revealed that demonstrations on arecanut gave 13.85 q/ha *chali* yield as compared to 10.79 q/ha in check. Among technologies demonstrated, ICM technology gave higher yield of 14.60 q/ha as compared to 10.54 q/ha under check. In coffee, ICM gave 20.00 per cent higher yield with 37.50 q/ha/year as compared to check (31.25 q/ha).



ICM in coffee (KVK, Kodagu)

### (b) Kerala

A total of 29 FLDs were conducted by KVKs of Kerala on important plantation crop of Kerala i.e coconut with INM, IDM and drought management technologies in 6.94 ha of farmers' fields (Table 49). These technology demonstrations in coconut gave an average yield of 13235 nuts/ha/year over check (8987 nuts/ha/year) leading to high net returns (₹.119449/ha) as compared check (₹.53047).

### 3.1.2.12 Spice crops

A total of 195 FLDs were undertaken by KVKs of Zone XI in major spices like black pepper, ginger, turmeric, garlic, betelvine, chilli, and coriander covering an area of 25.09 ha. State and technology wise results are discussed below:

#### (a) Karnataka

A total of 86 FLDs were conducted by KVKs of Karnataka on spices which includes betelvine (20), black pepper (18), chilli (15), coriander (10), garlic (10), ginger (50 and turmeric (8) in 21.42 ha of farmers' fields and results are presented in Table 50. Results indicated that betel leaf yield recorded under ICM technology was 18.46 per cent higher yield of 2020337 leaves/ha with net profit of ₹. 514346/ha. IPDM technology in black pepper gave 12.53q/ha dry pepper yield as compared to 8.62 q/ha in check. In chilli, ICM gave 22.65q/ha dry chilli yield, which was 18.30 per cent higher over check. ICM in coriander gave 78.27q/ha green coriander leaf yield as compared to 68.67q/ha in check. Nutrient management in garlic gave 55.90q/ha as compared to 47.40 q/ha in check. In ginger, IDM gave 243.94 q/ha fresh rhizome yield in comparison to 148.18 q/ha in check. Turmeric variety Prathibha gave 30.59 per cent higher rhizome yield over check.

#### (b) Kerala

A total of 109 FLDs were conducted by KVKs of Kerala on spices which includes black pepper (43), ginger (31) and turmeric (35) in 3.67 ha of farmers' fields and results

**Table 49: Frontline demonstrations on plantation crops conducted by KVKs in Zone XI**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)				
					Demo	Check	Increase (%)	Demo		Check		
								Net return	BCR	Net return	BCR	
<b>(a)Karnataka</b>												
Arecanut	ICM	3	16	6.00	14.60	10.54	34.63	265869	3.90	301586	3.68	
	INM	2	15	5.00	14.07	12.09	16.10	344525	3.86	281656	3.52	
	Pest management	1	5	2.00	11.16	8.89	25.53	335866	3.88	259922	3.39	
	<b>Total</b>		<b>36</b>	<b>13.00</b>	<b>13.85</b>	<b>10.79</b>	<b>26.93</b>	<b>303754</b>	<b>3.88</b>	<b>287999</b>	<b>3.58</b>	
Coffee	ICM	1	10	4.00	37.50	31.25	20.00	142200	2.35	106400	2.07	
<b>Total (Karnataka)</b>			<b>46</b>	<b>17.00</b>								
<b>(b) Kerala</b>												
Coconut	INM	2	10	3.00	10465	9053	18.00	119568	4.10	52556	1.54	
	IDM	2	15	3.14	13110	6690	91.00	91660	2.16	25985	1.41	
	Drought management	1	4	0.80	19028	13452	41.45	174787	2.58	108155	2.16	
<b>Total (Kerala)</b>			<b>29</b>	<b>6.94</b>	<b>13235</b>	<b>8987</b>	<b>51.63</b>	<b>119449</b>	<b>3.02</b>	<b>53047</b>	<b>1.61</b>	
<b>Grand total (a + b)</b>			<b>75</b>	<b>23.94</b>								

are presented in Table 51. Results show that IPDM technology demonstration in black pepper gave 23.44 per cent increased yield (15.33 q/ha dry pepper) with BCR of 4.02 over check (yield 12.59 q/ha and BCR 2.84). In ginger, scientific cultivation, micro nutrient management and IPDM gave higher yield of 146.28

q/ha, 185.00 q/ha and 161.00 q/ha, respectively which were 43.58 per cent, 33.09 per cent and 11.03 per cent higher over their checks, respectively. Pragati variety of turmeric gave high yield (246.57 q/ha) as compared to check (147.16q/ha).



Turmeric variety Pragati (KVK, Alappuzha)



FLD on black pepper (KVK, Kodagu)

**Table 50: Frontline demonstrations on spice crops conducted by KVKs of Karnataka**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demos		Check	
								Net return	BCR	Net return	BCR
Betel vine	ICM (no of leaves/ha)	3	20	5.00	2020337	1746380	18.46	514346	3.00	446964	2.65
Black pepper	IPDM	3	18	5.12	12.53	8.62	45.75	295342	2.89	176553	2.49
Chilli	ICM	2	15	4.00	22.65	18.30	33.89	295768	2.82	442900	5.93
Coriander	ICM	1	10	2.00	78.27	68.67	13.98	59970	2.81	45570	2.24
Garlic	Nutrient management	1	10	4.00	55.90	47.40	17.93	720250	3.52	512792	2.90
Ginger	IDM	1	5	0.10	243.94	148.18	64.62	490335	3.72	256245	2.69
Turmeric	Prathibha	2	8	1.20	197.47	139.61	30.59	396535	3.21	277615	2.62
<b>Total</b>			<b>86</b>	<b>21.42</b>							

**Table 51: Frontline demonstrations on spice crops conducted by KVKs of Kerala**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Black pepper	IPDM	4	35	1.56	15.33	12.59	23.44	309678	4.02	234555	2.84
	Homestead farming	1	8	0.19	4 kg dry pepper	-	-	-	1.00	-	-
<b>Total</b>			<b>43</b>	<b>1.75</b>	<b>15.33</b>	<b>12.59</b>	<b>23.44</b>	<b>309678</b>	<b>4.02</b>	<b>234555</b>	<b>2.84</b>
Ginger	Scientific cultivation	2	16	0.80	146.28	103.94	43.58	633705	2.02	355745	1.72
	Micronutrient management	1	5	0.20	185.00	139	33.09	970000	2.10	600000	1.76
	IPDM	1	10	0.12	161.00	145	11.03	12875	1.02	34250	1.07
<b>Total</b>			<b>31</b>	<b>1.12</b>	<b>159.64</b>	<b>122.97</b>	<b>32.82</b>	<b>562571</b>	<b>1.79</b>	<b>336435</b>	<b>1.57</b>
Turmeric	Pragati	6	35	0.80	246.57	147.16	57.72	618137	3.73	233574	2.45
<b>Grand total</b>			<b>109</b>	<b>3.67</b>							

### 3.1.2.13 Medicinal and aromatic crops

A total of 10 FLDs were conducted by one KVK in Karnataka on medicinal plant Ashwagandha with ICM technology in 4.00 ha that gave economic yield of 2.85 q/ha with net profit of ₹. 24025/ha and BCR (2.28).

### 3.1.2.14 Flower crops

A total of 40 FLDs were conducted by KVKs of Zone-XI on flower crops covering an area of 6.72 ha. State and technology wise results are presented in foregoing discussion.

#### (a) Karnataka

A total of 30 FLDs were conducted by KVKs of Karnataka under flower crops which includes chrysanthemum (5), rose (10), tuberose (5) and Udupi jasmine (10) in 6.60 ha of farmers' fields and results are presented in Table 52. Results revealed that the ICM in chrysanthemum recorded higher flower yield of 57.50 q/ha as compared to 48.80 q/ha in check. ICM technology in rose gave 14.64 per cent higher yield (205.29 q/ha) as compared to 177.56 q/ha in check. Tuberose variety Arka Prajwal gave 410.00 q/ha flower yield/ha/year as compared to 336.66 q/ha in check. In Udupi jasmine, ICM technology recorded a flower yield of 7.63 q/ha as compared to check (6.48q/ha).



ICM in chrysanthemum (KVK, Gadag)



Tuberose variety Arka Prajwal (KVK, Shivamogga)

#### (b) Kerala

Ten FLDs were conducted by one KVK of Kerala on marigold as inter crop in chilli in 0.12 ha which gave flower yield of 48.00 q/ha with net profit of ₹. 61923/ha as an additional income and BCR (1.71).

### 3.1.2.15 Crop hybrids in Karnataka

A total of 421 FLDs were conducted by KVKs of Karnataka on crop hybrids which includes maize (155), sunflower (10), Bt. cotton (75), okra (25), bitter gourd (5), ridge gourd (5), brinjal (5), cabbage (10), chilli (120), french bean (30), pole bean (5), tomato (107), papaya (25) and watermelon (5) in 125.90 ha of farmers' fields and results are presented in Table 53. Results indicated that maize hybrids gave higher yield ranging from 10.24 per cent to 18.50 per cent over checks. Hybrids in maize recorded grain yield of 56.05 q/ha as compared to 49.00 q/ha in checks. In sunflower, KBSH-78 hybrid gave 9.68 q/ha. In cotton, Bt hybrids of cotton performed superior by recording 17.80 per cent higher seed cotton yield than check with better BCR (1.91). Okra hybrid Arka Nikita recorded 17.07 per cent higher yield of 191.33 q/ha over check. Brinjal hybrid Vijay performed superior than check by registering an average yield of 319.50 q/ha with higher economic returns. In cabbage, Saint hybrid recorded 13.22 per cent higher yield (310.00 q/ha) as compared to check (273.40

**Table 52: Frontline demonstrations on flower crops conducted by KVKs of Karnataka**

Crop	Variety/ Production technology	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Chrysanthemum	ICM	1	5	2.00	57.50	48.80	17.83	230960	2.62	184600	2.39
Rose	ICM	2	10	3.00	205.29	177.56	14.64	887804	4.30	649729	3.12
Tuberose	Arka Prajwal	1	5	1.20	410.00	336.66	21.78	124867	1.57	106933	1.65
Udupi jasmine	ICM	1	10	0.40	7.63	6.48	17.75	242012	4.01	191387	3.65
	<b>Total</b>		<b>30</b>	<b>6.60</b>							

q/ha). In chilli, hybrids Arka Kyathi, Arka Haritha, KSP-1227 and Sitara have performed superior than their checks by recording an average green chilli yield of 200.18 q/ha as compared to 167.78 q/ha under checks. French bean hybrid, Arka Arjun recorded a bean yield of 94.50 q/ha as compared to 81.85 in check. Private hybrid Sony in pole bean gave higher yield of

311.02 q/ha as compared to its check. Hybrids of tomato have performed better namely Arka Samrat (208.00 q/ha) and Arka Abhed (649.00 q/ha) than checks and gave better economic returns. Papaya hybrid Taiwan 786 recorded a yield of 1014.50 q/ha with net returns of ₹. 404475/ha. In watermelon, sugar queen gave 622.70 q/ha with net profit of ₹. 180600/ha.



Sunflower hybrid KBSH-78 (KVK, Chamaraj Nagar)



Tomato hybrid ArkaAbhed (KVK, Mandya)

**Table 53: Frontline demonstrations on crop hybrids conducted by KVKs of Karnataka**

Crop	Name of hybrid	KVKs (No.)	FLDs (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net returns	BCR	Net returns	BCR
Maize	CP-818	3	25	10.00	47.01	39.13	18.50	22208	1.63	19373	1.60
	MAH-14-5	4	40	16.00	54.11	47.87	12.30	52182	2.31	44611	2.08
	Pioneer	2	10	4.00	52.30	50.00	10.24	40141	2.20	50657	2.60
	Dekalb-9141	2	5	1.00	75.17	65.82	14.20	81748	2.19	54548	1.85
	PAC-740	2	10	4.00	86.56	76.27	13.48	48881	2.56	47981	2.30
	<b>Total</b>		<b>155</b>	<b>61.00</b>	<b>56.05</b>	<b>49.00</b>	<b>13.16</b>	<b>43376</b>	<b>2.08</b>	<b>37811</b>	<b>1.96</b>
Sunflower	KBSH-78	2	10	4.00	9.68	2.65	265.30	13841	0.42	11976	1.43
Bt. Cotton	Pvt. Hybrid	6	75	26.00	18.72	15.75	17.80	38772	1.91	42594	2.07
Bhendi	Arka Nikitha	4	25	7.00	191.33	162.58	17.07	205576	3.37	254592	3.79
Bitter gourd	Pvt. Hybrid	1	5	2.00	129.00	115.00	12.17	289488	3.90	249695	3.50
Ridge gourd	Pvt. Hybrid	1	5	1.00	122.80	112.00	9.62	110815	2.51	95,150	2.31
Brinjal	Vijay	1	5	1.00	319.50	297.40	7.43	319427	4.34	263883	3.84
Cabbage	Saint	2	10	3.00	310.00	273.40	13.22	227294	4.42	174782	3.87
Chilli	Sitara	1	10	4.00	159.70	144.60	10.40	116320	2.56	96896	2.27
	Arka Kyathi	3	35	5.00	271.67	225.67	21.99	292787	3.48	215993	2.70
	Arka Haritha	1	5	1.00	225.40	179.80	25.36	211700	4.60	154980	3.54
	Pvt. Hybrid	1	10	2.00	95.00	87.20	8.90	-20,904	0.78	-25,910	0.73
	KSP-1227	1	5	2.00	34.70	28.00	23.92	342000	3.11	476000	4.20
	<b>Total</b>		<b>120</b>	<b>25.00</b>	<b>200.18</b>	<b>167.78</b>	<b>18.11</b>	<b>227533</b>	<b>3.07</b>	<b>195742</b>	<b>2.69</b>
French bean	Arka Arjuna	2	30	4.00	94.50	81.85	12.62	146925	3.56	108225	3.26
Pole bean	Sony	1	5	1.00	311.02	281.50	10.49	597527	5.01	467415	4.07
Tomato	Arka Abhed	3	30	4.00	649.00	561.00	32.20	451787	3.72	340463	2.84
	Arka Samrat	2	11	4.40	208.00	176.00	17.00	51913	1.26	7405	1.03
	Pvt. Hybrid	4	25	8.00	383.00	300.00	22.00	227043	3.18	299238	3.58
	<b>Total</b>		<b>107</b>	<b>32.80</b>	<b>432.20</b>	<b>361.21</b>	<b>23.73</b>	<b>261005</b>	<b>2.85</b>	<b>234638</b>	<b>2.61</b>
Papaya	Taiwan 786	1	25	9.00	1014.50	871.50	16.29	404475	2.88	503900	3.57
Watermelon	Sugarqueen	1	5	2.50	622.70	516.90	16.98	180600	3.65	144000	3.31
	<b>Grand total</b>		<b>421</b>	<b>125.90</b>							

### 3.1.2.16 Frontline demonstrations under farm mechanization

A total of 154 FLDs were conducted by KVKs of Zone-XI under farm mechanization wherein nine farm implements/machinery covered in 71.32 ha and details are presented in Table 54. Data shows that a total of 106 FLDs with farm implements/machinery were conducted by eight KVKs of Karnataka such as drum seeder (50), tractor operated paddy straw baler (10), improved seed cum fertilizer drill, cycle weeder, power tiller operated ragi harvester and winnower (4), mechanised harvester (2), solar powered nipping machine (10), tractor operated cotton shredder (20) and safe storage of food grain (10) covering 43.20 ha of farmers' fields and 48 FLDs were conducted by three KVKs of Kerala such as drone based fertiliser spraying for paddy (42) and banana bunch covering device (6) in 28.12 ha of farmers' fields.

cum fertilizer drill, cycle weeder, power tiller operated harvester and winnower in ragi (4), mechanized harvester in sugarcane (2), solar powered nipping machine in pigeonpea (10), tractor operated cotton shredder (20) and safe storage of food grain (10) covering 43.20 ha of farmers' fields and 48 FLDs were conducted by three KVKs of Kerala such as drone based fertiliser spraying for paddy (42) and banana bunch covering device (6) in 28.12 ha of farmers' fields.

**Table 54: Frontline demonstrations on farm implements conducted by KVKs in Zone XI**

Farm implements/machinery	Crop	KVKs (No.)	Demos (No.)	Area (ha)
<b>(a) Karnataka</b>				
Drum seeder	Paddy	1	50	20.00
Tractor operated paddy straw baler	Paddy	1	10	0.40
Improved seed cum fertilizer drill, Cycle weeder, Power tiller operated ragi harvester and Winnower	Ragi	1	4	2.40
Mechanised harvester	Sugarcane	1	2	2.00
Solar powered nipping machine	Pigeonpea	1	10	4.00
Tractor operated cotton shredder	Cotton	2	20	4.40
Safe storage of food grain	Grains	1	10	10.00
<b>Total (a)</b>			<b>106</b>	<b>43.20</b>
<b>(b) Kerala</b>				
Drone based fertilizer spraying for paddy	Paddy	2	42	28.00
Banana bunch covering device	Banana	1	6	0.12
<b>Total (b)</b>			<b>48</b>	<b>28.12</b>
<b>Grand total (a + b)</b>			<b>154</b>	<b>71.32</b>



Seed cum fertilizer drill in ragi (KVK, Hassan)



Cotton shredder (KVK, Kalaburagi-II)



Drone use for spraying in paddy (KVK, Kollam)



Bunch covering in banana (KVK, Thrissur)

### 3.1.2.17 Farm Enterprises

A total of 1248 demonstration units were established by KVKs of Zone XI under farm enterprises by involving 1682 farmers/farm women in Karnataka, Kerala and Lakshadweep Islands and details are presented in Table 55. Data indicated that the KVKs of Karnataka established 844 farm enterprising units by involving 964 farmers/farm women which includes fisheries (5), mushroom (3), nursery (5), nutri gardens (330), poultry (11), sericulture (349), storage of grains (21), value

addition to millets and tamarind (30) and others (90). KVKs of Kerala established 396 farm enterprising units by involving 702 farmers/farm women which includes apiculture (5), mushroom (35), nursery (1), nutrigarden (145), storage of grains (2), value addition (183) and vegetable production (25). KVK, Lakshadweep established 8 farm enterprising units by involving 16 farmers/farm women which includes coir pith compost (1), tuna waste compost (5), value addition- indigenous coconut jaggery (1) and value addition- indigenous coconut halwa (1).

**Table 55: Frontline demonstrations on farm enterprises conducted by KVKs in Zone XI**

Category	KVKs (No.)	F armers/farm women (No.)	Units (No.)
<b>(a) Karnataka</b>			
Fisheries	1	5	5
Mushroom	1	3	3
Nursery	1	5	5
Nutrigarden	8	330	330
Poultry	2	11	11
Sericulture	11	349	349
Storage of grains	3	26	21
Value addition to millets and tamarind	14	145	30
Others	2	90	90
<b>Total (a)</b>		<b>964</b>	<b>844</b>
<b>(b) Kerala</b>			
Apiculture	1	5	5
Mushroom	5	35	35
Nursery	1	5	1
Nutrigarden	6	286	145
Storage of grains	1	10	2
Value addition	14	336	183
Vegetable production	2	25	25
<b>Total (b)</b>		<b>702</b>	<b>396</b>
<b>(c) Lakshadweep</b>			
Coir pith compost	1	5	1
Tuna waste compost	1	5	5
Value addition- indigenous coconut jaggery	1	3	1
Value addition- indigenous coconut halwa	1	3	1
<b>Total (c)</b>		<b>16</b>	<b>8</b>
<b>Grand total (a+b+c)</b>		<b>1682</b>	<b>1248</b>



Silk worm rearing unit (KVK, Kolar)



Apiculture unit (KVK, Alappuzha)

### 3.1.2.18 Livestock and fisheries

A total of 776 FLDs were conducted by KVKs of Zone XI under livestock and fisheries and established 754 units. State and livestock and fisheries wise details are given below:

#### (a) Karnataka

A total of 441 FLDs were conducted by KVKs of Karnataka under livestock and fisheries wherein established 444 units which includes dairy and cattle (238), piggery (5), sheep and goats (132) and fisheries (66) and details are presented in Table 56. Data revealed that the dairy technologies such as management of anoestrus in dairy animals, ecto-parasites in dairy cows, clean milk production procedures for prevention of mastitis in cows using CMT kit, modified PG protocol for management of repeat breeding, CIDR synch protocol for management of anoestrus in cows and buffalo, impregnated nanofibers for induction of oestrus in repeat breeding cows/ preventive protocols for subclinical and clinical mastitis, demonstration on green fodder and azolla feeding, supplementation of bypass fat, probiotics in the feed of cattle and buffalo, silage bags for silage production, hydroponic fodder production and feeding for higher milk productivity, feeding of area specific mineral mixture, feeding colostrum/milk and calf starter to female calves during early stage, pre and post calving management in dairy cattle, integrated management of dairy animals, Ca gel and syrup supplementation and ration balancing through integrated approach in dairy animals were demonstrated

covering 296 animals and 250 units. Integrated approaches to reduce piglet mortality at the age of weaning was demonstrated in piggery covering 30 animals and 15 units. In sheep and goat, controlling of parasitic infestations and feeding based on Indian standards for better performance, integrated health management, supplementation of immune boosters, strategic health care practices in sheep flock from weaning till the age of maturity, feeding concentrate, deworming & mineral mixture, management of anoestrus, use of endo and ectoparasiticides, demonstration of species specific mineral mixture, integrated health management, silage drums for silage production for stall fed goat/sheep farming and region based mineral mixture in intensive system of rearing were demonstrated covering 1734 animals and 119 units. In fisheries, seed production and nutrition management were demonstrated through 60 units.



Stall fed housing system in goat (KVK, Dharwad)

**Table 56: Frontline demonstrations under livestock and fisheries conducted by KVKs of Karnataka**

Category	KVKs (No.)	FLDs (No.)	Units (No.)	Animals (No.)
<b>Dairy and cattle</b>				
Buffalo	2	28	30	30
Cattle (Cow)	14	124	104	150
Nutrition management	12	116	116	116
<b>Total</b>		238	250	296
Piggery	1	5	15	30
<b>Sheep and goats</b>				
Sheep	5	45	45	1050
Goat	2	12	12	24
Nutrition management	8	75	62	660
<b>Total</b>		132	119	1734
<b>Fisheries</b>				
Seed production	2	10	10	-
Nutrition management	8	51	45	-
Others	1	5	5	-
<b>Total</b>		66	60	-
<b>Grand total</b>		441	444	2060



Goatry unit (KVK, Uttara Kannada)



Fisheries unit (KVK, Davanagere)



Integrated Nano-fibers for induction oestrus in repeat breeding cows (KVK, Raichur)

### (b) Kerala

A total of 335 FLDs were conducted by KVKs of Kerala under livestock and fisheries through establishment of 310 units which includes dairy and cattle (196), piggery (3), sheep and goats (46), poultry (45) and fisheries (45) and details are presented in Table 57. In dairy, demonstration on estrous synchronization, biosecurity measures in small scale farms for disease prevention, TANUVAS-Masti Guard for prevention of common mastitis in, topical application of ceylon oak oil for ecto-parasite control and to heal bite injuries, prevention of mastitis through nutritional management and dry cow therapy, therapeutic management of pododermatitis,

artificial insemination with sexed semen in elite cows, integrated management with complete feeding and hygienic management protocols, silage technology, Good Feeding and Management Strategies (GOFAMS) to augment milk production, Total Mixed Ration (TMR) feeding for enhanced productivity, *Moringa oleifera* as a forage to improve milk production, area specific chelated mineral mixture were demonstrated covering 305 animals and 180 units. In piggery, mineral mixture supplement was demonstrated covering 15 animals and 3 units. In goat, oestrous synchronization and AI, estrus synchronization and fixed time breeding in malabari breed, synchronisation of heat and AI, and integrated feeding and management under broiler goat rearing were demonstrated covering 174 animals and 180 units.

In poultry, pinless peepers to reduce injurious pecking (IP) in layers, BV 380 breed in intensive system of rearing, low cost portable mini poultry brooder with package of practices for backyard poultry rearing, probiotics to reduce antibiotic use in broilers, omega 3 fatty acid enriched egg production using sardine fish oil supplementation in layer feed, production of low cholesterol eggs and scientific management of Japanese Quail (egg production) were demonstrated covering 5400 poultry birds and 40 units. In fisheries, 10 KVKs demonstrated fish production technologies through establishing 41 units.



Goatry unit (KVK, Pathanamthitta)



Poultry unit (KVK, Ernakulam)

**Table 57: Frontline demonstrations on livestock and fisheries conducted by KVKs of Kerala**

Category	KVKs (No.)	FLDs (No.)	Units (No.)	Animals/poltry birds(No.)
<b>Dairy and cattle</b>				
Cattle (Cow)	8	92	83	167
Nutrition management	8	104	97	138
<b>Total</b>		<b>196</b>	<b>180</b>	<b>305</b>
<b>Piggery</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>15</b>
Goat	5	46	46	174
<b>Poultry</b>				
Poultry - Chicken	6	40	35	5300
Quail	1	5	5	100
<b>Total</b>		<b>45</b>	<b>40</b>	<b>5400</b>
<b>Fishery</b>				
Fishery	8	37	37	-
Pond and water management	2	8	4	-
<b>Total</b>		<b>45</b>	<b>41</b>	<b>-</b>
<b>Grand total</b>		<b>335</b>	<b>310</b>	<b>5894</b>



Fisheries unit (KVK, Pathanamthitta)

**(c) Lakshadweep**

Ten FLDs were conducted by KVK, Lakshadweep on quail farming as a source of family income and established 10 backyard quail units in the Lakshadweep Islands.

**3.1.2.19 Women and children empowerment programmes**

A total of 2779 programmes on empowerment of women and children were conducted by KVKs in the Zone with the participation of 78367 women and children and details are presented in Table 58. Data shows that the KVKs of Karnataka organised 1739 programmes of which 1616 for women and 123 for children wherein 36918 women (34904) and children (2014) were participated. Among programmes organised for women, awareness programmes were more (324) through 31 KVKs followed by nutri garden (296), women empowerment (271), health and nutrition (249), farming

system (194), value addition (146), kitchen garden (135), enterprises (124), others (66), drudgery reduction (64), storage technique (47) and coconut tree climbing (2). Regarding children, 123 programmes were organised of which 107 on health and nutrition and 16 on other aspects of children. In case of Kerala, KVKs organised 1040 programmes of which 969 for women and 71 for children wherein 41449 women (33380) and children (8069) were participated. Programmes organised on value addition were more (273) among women programmes followed by enterprises (234), others (187), nutri garden (176), awareness programmes (122), health and nutrition (116), drudgery reduction (52), farming system (47), women empowerment (40), kitchen garden (29), storage technique (12) and coconut tree climbing (1). A total of 71 programmes were organised for children of which 51 on health and nutrition and 20 on other aspects of children.



FLD on Nutri garden (KVK, Haveri)

**Table 58: Women and children empowerment programmes implemented by KVKs in Zone XI**

Category	Name of programme	Karnataka		Kerala		Total	
		Programmes (No.)	KVKs (No.)	Programmes (No.)	KVKs (No.)	Programmes (No.)	KVKs (No.)
(a) Women programmes	Awareness programmes	324	31	122	11	446	42
	Coconut tree climbing	2	1	1	1	3	2
	Drudgery reduction	64	16	52	6	116	22
	Enterprises	124	29	234	14	358	43
	Farming system	194	16	47	9	241	25
	Health and nutrition	249	29	116	13	365	42
	Kitchen garden	135	19	29	8	164	27
	Nutri garden	296	32	176	14	472	46
	Storage technique	47	18	12	4	59	22
	Value addition	146	26	273	14	419	40
	Women empowerment	271	24	40	12	311	36
	Others	66	17	187	8	253	25
<b>Total</b>		<b>1616</b>		<b>969</b>		<b>2585</b>	
(b) Women participants (No.)		34904		33380		68284	
(c) Children programmes	Health and nutrition	107	24	51	5	158	29
	Others	16	7	20	5	36	12
<b>Total</b>		<b>123</b>		<b>71</b>		<b>194</b>	
(d) Children participants (No.)		2014		8069		10083	
<b>Total programmes (a + c)</b>		<b>1739</b>		<b>1040</b>		<b>2779</b>	
<b>Total participants (b + d)</b>		<b>36918</b>		<b>41449</b>		<b>78367</b>	



Women awareness programme (KVK, Bagalakote)



Nutri garden at Nemari tribal village (KVK, Idukki)

### 3.1.3 Capacity Development

One of the main activities of KVKs is capacity development of farmers and extension personnel to update their knowledge and skills on modern agricultural technologies. Keeping this in view, KVKs in the Zone organized various capacity development programmes for different category of participants representing farmers, farmwomen, rural youth, extension personnel and other stake holders during the year. State and participant category wise training courses organized and the number of participants are presented in Table 59. Data indicated that a total of 4818 training courses were organized wherein

trained 302408 participants. Out of which 3112 courses were organized with 100981 participants by KVKs of Karnataka, 1677 courses with 200801 participants by KVKs of Kerala and 29 courses with 626 participants by KVK, Lakshadweep. According to training type and participant category, 3544 training courses were organized for farmers (249250 participants), 440 training courses for rural youth (16265 participants), 201 training courses for extension personnel (8475 participants), 521 sponsored training courses (19039 participants) and 112 vocational training courses (9379 participants).

**Table 59: State and participant category wise capacity development courses organized by KVKs in Zone XI**

State	Participant category and capacity development (No.)											
	Farmers/Farm women		Rural youth		Extension personnel		Sponsored courses		Vocational courses		Total	
	C	P	C	P	C	P	C	P	C	P	C	P
Karnataka	2487	78866	189	5455	156	6936	219	8093	61	1631	3112	100981
Kerala	1035	169844	245	10734	44	1529	302	10946	51	7748	1677	200801
Lakshadweep	22	540	6	76	1	10	0	0	0	0	29	626
<b>Total</b>	<b>3544</b>	<b>249250</b>	<b>440</b>	<b>16265</b>	<b>201</b>	<b>8475</b>	<b>521</b>	<b>19039</b>	<b>112</b>	<b>9379</b>	<b>4818</b>	<b>302408</b>

*C = Courses; P = Participants*

### 3.1.3.1 Farmers and Farm Women

#### (a) State wise

Capacity development courses organized for farmers and farm women by KVKs of Zone XI are presented in Table 60. Data indicated that a total of 3544 capacity development courses were conducted and trained 249250 farmers and farm women (208941 male and 40309 female) of which 229569 (196158 male and 33411 female) were general and 19681 (12784 male and 6897 female) were SC/ST. KVKs of Karnataka have organized 2487 capacity development courses and trained 78866 farmers and farm women (58674 male and 20192 female) of which 62843 (37405 male and 15438 female) were general and 16023 (11270 male and 4753 female) were SC/ST. KVKs of Kerala have organized 1035 capacity development courses and trained 169844 farmers and farm women (150184 male and 19660 female) of which 166726 (148753 male and 17973 female) were general and 3118 (1431 male and

1687 female) were SC/ST. KVK, Lakshadweep organized 22 capacity development courses and trained 540 farmers and farm women (83 male and 457 female), all belonging to SC/ST.

#### (b) Area wise

Capacity development courses conducted for farmers/farmwomen on different training areas by KVKs in the Zone are presented in Table 61. Data reveals that crop production was the major area of capacity development with 758 courses and 57650 participants. Capacity development on plant protection (526 courses) and home science/women empowerment (492 courses) were next major important areas followed by livestock production and management (381 courses). More courses were also organized for vegetable crops under horticulture (269 courses).

Area wise capacity development courses conducted for farmers and farm women by KVKs of Karnataka, Kerala and Lakshadweep are presented in Tables 62, 63 and 64, respectively.

**Table 60: State wise capacity development courses conducted for farmers and farm women by KVKs in Zone-XI**

State	Capacity development courses (No.)	Participant farmers and farm women (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	2487	47405	15438	62843	11270	4753	16023	58674	20192	78866
Kerala	1035	148753	17973	166726	1431	1687	3118	150184	19660	169844
Lakshadweep	22	0	0	0	83	457	540	83	457	540
<b>Total</b>	<b>3544</b>	<b>196158</b>	<b>33411</b>	<b>229569</b>	<b>12784</b>	<b>6897</b>	<b>19681</b>	<b>208941</b>	<b>40309</b>	<b>249250</b>

**Table 61: Area wise capacity development courses conducted for farmers and farm women by KVKs in Zone-XI**

Capacity development area	Capacity development courses (No.)	Participant farmers and farm women (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production	758	48575	4770	53345	3278	1027	4305	51854	5796	57650
Horticulture										
a) Vegetable crops	269	29202	3358	32560	791	358	1149	29996	3713	33709
b) Fruit crops	134	8806	562	9368	509	144	653	9320	701	10021
c) Ornamental plants	23	1229	132	1361	41	39	80	1270	171	1441
d) Plantation crops	65	4656	274	4930	206	79	285	4862	353	5215
e) Tuber crops	24	5226	218	5444	11	55	66	5237	273	5510
f) Spices	49	5247	463	5710	114	85	199	5361	548	5909
g) Medicinal and aromatic plants	4	49	21	70	47	19	66	96	40	136
Soil health and fertility management	326	14600	2175	16775	1502	441	1943	16102	2616	18718
Livestock production and management	381	9463	2931	12394	1410	759	2169	10873	3690	14563
Home science/women empowerment	492	9408	10803	20211	883	2143	3026	10296	12941	23237
Agriculture Engineering	91	26232	917	27149	194	108	302	26426	1025	27451
Plant protection	526	19886	3383	23269	2313	794	3107	22195	4181	26376
Fisheries	43	1619	233	1852	141	176	317	1755	414	2169
Production of inputs at site	202	4528	1749	6277	741	360	1101	5269	2109	7378
Capacity building and group dynamics	116	4778	1293	6071	410	253	663	5189	1545	6734
Agro-forestry	41	2654	129	2783	193	57	250	2840	193	3033
<b>Total</b>	<b>3544</b>	<b>196158</b>	<b>33411</b>	<b>229569</b>	<b>12784</b>	<b>6897</b>	<b>19681</b>	<b>208941</b>	<b>40309</b>	<b>249250</b>

**Table 62: Area wise capacity development courses conducted for farmers and farm women by KVKs of Karnataka**

Capacity development area	Capacity development courses (No.)	Participant farmers and farm women (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production	593	11986	1945	13931	2998	743	3741	14985	2687	17672
Horticulture										
a) Vegetable crops	162	2896	965	3861	670	214	884	3569	1176	4745
b) Fruit crops	105	2057	325	2382	451	117	568	2513	437	2950
c) Ornamental plants	11	147	38	185	37	25	62	184	63	247
d) Plantation crops	41	858	208	1066	192	70	262	1050	278	1328
e) Tuber crops	4	140	0	140	2	0	2	142	0	142
f) Spices	23	526	45	571	106	37	143	632	82	714
g) Medicinal and aromatic plants	4	49	21	70	47	19	66	96	40	136
Soil Health and fertility management	276	6375	1264	7639	1317	317	1634	7692	1581	9273
Livestock production and management	271	4915	1145	6060	1237	541	1778	6152	1686	7838
Home Science/women empowerment	341	2767	6360	9127	753	1565	2318	3525	7920	11445
Agriculture Engineering	37	640	128	768	137	53	190	777	181	958
Plant protection	386	9325	1688	11013	2116	600	2716	11437	2292	13729

Table contd...

Fisheries	36	817	153	970	113	43	156	925	201	1126
Production of inputs at site	91	1848	606	2454	576	154	730	2424	760	3184
Capacity building and group dynamics	73	1315	425	1740	325	198	523	1641	622	2263
Agro-forestry	33	744	122	866	193	57	250	930	186	1116
<b>Total</b>	<b>2487</b>	<b>47405</b>	<b>15438</b>	<b>62843</b>	<b>11270</b>	<b>4753</b>	<b>16023</b>	<b>58674</b>	<b>20192</b>	<b>78866</b>

**Table 63: Area wise capacity development courses conducted for farmers and farm women by KVKs of Kerala**

Capacity development area	Capacity development courses (No.)	Participant farmers and farmwomen (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production	161	36589	2825	39414	253	161	414	36842	2986	39828
Horticulture										
a) Vegetable crops	107	26306	2393	28699	121	144	265	26427	2537	28964
b) Fruit crops	29	6749	237	6986	58	27	85	6807	264	7071
c) Ornamental plants	12	1082	94	1176	4	14	18	1086	108	1194
d) Plantation crops	24	3798	66	3864	14	9	23	3812	75	3887
e) Tuber crops	20	5086	218	5304	9	55	64	5095	273	5368
f) Spices	26	4721	418	5139	8	48	56	4729	466	5195
Soil health and fertility management	50	8225	911	9136	185	124	309	8410	1035	9445
Livestock production and management	110	4548	1786	6334	173	218	391	4721	2004	6725
Home Science/women empowerment	147	6641	4443	11084	130	406	536	6771	4849	11620
Agriculture Engineering	54	25592	789	26381	57	55	112	25649	844	26493
Plant protection	139	10561	1695	12256	197	181	378	10758	1876	12634
Fisheries	4	802	80	882	7	10	17	809	90	899
Production of inputs at site	101	2680	1143	3823	130	180	310	2810	1323	4133
Capacity building and group dynamics	43	3463	868	4331	85	55	140	3548	923	4471
Agro-forestry	8	1910	7	1917	0	0	0	1910	7	1917
<b>Total</b>	<b>1035</b>	<b>148753</b>	<b>17973</b>	<b>166726</b>	<b>1431</b>	<b>1687</b>	<b>3118</b>	<b>150184</b>	<b>19660</b>	<b>169844</b>



Off campus capacity development course on scientific sheep and goat farming at Heggandoddi (KVK, Yadgir)



On campus capacity development course on balanced use of fertilizers (KVK, Idukki)

**Table 64: Area wise capacity development courses conducted for farmers and farm women by KVK, Lakshadweep**

Capacity development area	Capacity development courses (No.)	Participant farmers and farm women (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop production	4	0	0	0	27	123	150	27	123	150
Home Science/women empowerment	4	0	0	0	0	172	172	0	172	172
Plant protection	1	0	0	0	0	13	13	0	13	13
Fisheries	3	0	0	0	21	123	144	21	123	144
Production of inputs at site	10	0	0	0	35	26	61	35	26	61
<b>Total</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>83</b>	<b>457</b>	<b>540</b>	<b>83</b>	<b>457</b>	<b>540</b>

### 3.1.3.2 Rural youth

#### (a) State wise

Capacity development courses organized for rural youth by KVKs in the zone are presented in Table 65. Data indicated that a total of 440 capacity development courses were conducted and trained 16265 rural youth (10565 male and 5700 female) of which 14631 (9532 male and 5099 female) were general and 1634 (1033 male and 601 female) were SC/ST. KVKs of Karnataka have organized 189 capacity development courses and trained 5455 rural youth (4259 male and 1196 female) of which 4444 (3515 male and 929 female) were general and 1011 (744 male and 267 female) were SC/ST. KVKs of Kerala have organized 245 capacity development courses and trained 10734 rural youth (6306 male and 4428 female) of which 10187 (6017 male and 4170 female) were general and 547 (289 male and 258 female) were SC/ST. KVK, Lakshadweep has organized six capacity development courses and trained 76 rural youth (76 female) who belongs to SC/ST. Nearly 35.04 per cent of the rural youth trained were female, which is a proof for the fact that KVKs have given emphasis to women participation to acquire knowledge and skills in agriculture and related areas. Youth belonging to SC/ST also participated in good number (10.05 percent) but indicated further scope for mainstreaming the youth of socially disadvantaged sections.

#### (b) Area wise

Capacity development courses conducted for rural youth on different capacity development areas by KVKs in the Zone are presented in Table 66. Data revealed that a total of 440 capacity development courses were conducted for rural youth wherein trained 16265 participants in different areas. Value addition was the major capacity development area with 49 capacity development courses and 1460 participants. The relative popularity of value addition reflects the preference of rural youth in areas representing secondary agriculture. Nursery management of horticultural crops (26 courses, 572 participants), integrated farming (26 courses, 672 participants) and sheep and goat rearing (23 courses, 833 participants) were the other important capacity development areas for rural youth. Other capacity development areas (Awareness on Farm bill, INM, IPDM, Leadership development, Organic farming, Nutri garden, Micro irrigation, Plant propagation and Entrepreneurial development) collectively constituted for 115 programmes and 3211 participants.

Area wise capacity development courses conducted for rural youth by KVKs of Karnataka, Kerala and Lakshadweep are presented in Tables 67, 68 and 69, respectively.

**Table 65: State wise capacity development courses conducted for rural youth by KVKs in Zone XI**

State	Capacity development courses (No.)	Participant rural youth (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	189	3515	929	4444	744	267	1011	4259	1196	5455
Kerala	245	6017	4170	10187	289	258	547	6306	4428	10734
Lakshadweep	6	0	0	0	0	76	76	0	76	76
<b>Total</b>	<b>440</b>	<b>9532</b>	<b>5099</b>	<b>14631</b>	<b>1033</b>	<b>601</b>	<b>1634</b>	<b>10565</b>	<b>5700</b>	<b>16265</b>

**Table 66: Area wise capacity development courses conducted for rural youth by KVKs in Zone XI**

Capacity development area	Capacity development courses (No.)	Participant rural youth (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery management of horticulture crops	26	297	194	491	36	45	81	333	239	572
Training and pruning of orchards	2	27	6	33	7	0	7	34	6	40
Protected cultivation of vegetable crops	14	1169	524	1693	58	30	88	1227	554	1781
Commercial fruit production	7	178	48	226	13	0	13	191	48	239
Integrated farming	26	436	117	553	110	9	119	546	126	672
Seed production	9	1389	743	2132	5	5	10	1394	748	2142
Production of organic inputs	22	370	64	434	79	20	99	449	84	533
Planting material production	3	13	27	40	1	3	4	14	30	44
Vermi-culture	11	208	63	271	33	14	47	241	77	318
Mushroom production	21	275	210	485	16	16	32	291	226	517
Bee-keeping	22	442	85	527	37	17	54	479	102	581
Sericulture	8	164	19	183	21	0	21	185	19	204
Repair and maintenance of farm machinery and implements	12	201	78	279	41	6	47	242	84	326
Value addition	49	618	652	1270	85	105	190	703	757	1460
Small scale processing	8	635	595	1230	19	9	28	654	604	1258
Post-harvest technology	6	147	102	249	37	20	57	184	122	306
Tailoring and stitching	3	0	33	33	0	8	8	0	41	41
Rural crafts	6	34	59	93	0	3	3	34	62	96
Production of quality animal products	1	8	7	15	0	0	0	8	7	15
Dairying	22	350	71	421	70	57	127	420	128	548
Sheep and goat rearing	23	646	59	705	103	25	128	749	84	833
Quail farming	2	0	0	0	0	23	23	0	23	23
Poultry production	14	170	95	265	33	70	103	203	165	368
Ornamental fisheries	5	23	9	32	1	1	2	24	10	34
Composite fish culture	3	57	27	84	14	5	19	71	32	103
Others	115	1675	1212	2887	214	110	324	1889	1322	3211
<b>Total</b>	<b>440</b>	<b>9532</b>	<b>5099</b>	<b>14631</b>	<b>1033</b>	<b>601</b>	<b>1634</b>	<b>10565</b>	<b>5700</b>	<b>16265</b>

*Others includes training areas such as Awareness on Farm bill, INM, IPDM, Leadership development, Organic farming, Nutri garden, Micro irrigation, Plant propagation and Entrepreneurial development.*

**Table 67: Area wise capacity development courses conducted for rural youth by KVKs of Karnataka**

Capacity development area	Capacity development courses (No.)	Participant rural youth (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery management of horticulture crops	11	179	68	247	30	7	37	209	75	284
Training and pruning of orchards	2	27	6	33	7	0	7	34	6	40
Protected cultivation of vegetable crops	7	140	1	141	55	0	55	195	1	196
Commercial fruit production	4	109	1	110	10	0	10	119	1	120
Integrated farming	20	355	61	416	91	9	100	446	70	516
Seed production	3	46	0	46	4	0	4	50	0	50
Production of organic inputs	20	358	48	406	77	18	95	435	66	501
Vermi-culture	7	148	30	178	19	5	24	167	35	202
Mushroom production	8	73	96	169	8	9	17	81	105	186
Bee-keeping	9	238	12	250	18	7	25	256	19	275
Sericulture	8	164	19	183	21	0	21	185	19	204
Repair and maintenance of farm machinery and implements	2	106	3	109	32	1	33	138	4	142
Value addition	14	43	148	191	68	54	122	111	202	313
Small scale processing	2	26	12	38	15	3	18	41	15	56
Post-harvest technology	3	104	44	148	34	3	37	138	47	185
Tailoring and stitching	3	0	33	33	0	8	8	0	41	41
Dairying	19	332	59	391	64	53	117	396	112	508
Sheep and goat rearing	19	603	39	642	98	20	118	701	59	760
Composite fish culture	3	57	27	84	14	5	19	71	32	103
Others	25	407	222	629	79	65	144	486	287	773
<b>Total</b>	<b>189</b>	<b>3515</b>	<b>929</b>	<b>4444</b>	<b>744</b>	<b>267</b>	<b>1011</b>	<b>4259</b>	<b>1196</b>	<b>5455</b>

*Others includes training areas such as ICM, INM, Azolla cultivation, Nutrigarden, Soil health management and Economic self-reliance.*



Capacity development course on importance of nutrition in daily life at Orphanage (KVK, Bagalakote)



Capacity development course on fruit processing (KVK, Thrissur)

**Table 68: Area wise capacity development courses conducted for rural youth by KVKs of Kerala**

Capacity development area	Capacity development courses (No.)	Participant rural youth (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery management of horticulture crops	14	118	126	244	6	15	21	124	141	265
Protected cultivation of vegetable crops	7	1029	523	1552	3	30	33	1032	553	1585
Commercial fruit production	3	69	47	116	3	0	3	72	47	119
Integrated farming	6	81	56	137	19	0	19	100	56	156
Seed production	6	1343	743	2086	1	5	6	1344	748	2092
Production of organic inputs	2	12	16	28	2	2	4	14	18	32
Planting material production	3	13	27	40	1	3	4	14	30	44
Vermi-culture	4	60	33	93	14	9	23	74	42	116
Mushroom production	13	202	114	316	8	7	15	210	121	331
Bee-keeping	13	204	73	277	19	10	29	223	83	306
Repair and maintenance of farm machinery and implements	10	95	75	170	9	5	14	104	80	184
Value addition	32	575	504	1079	17	21	38	592	525	1117
Small scale processing	6	609	583	1192	4	6	10	613	589	1202
Post-harvest technology	3	43	58	101	3	17	20	46	75	121
Rural crafts	6	34	59	93	0	3	3	34	62	96
Production of quality animal products	1	8	7	15	0	0	0	8	7	15
Dairying	3	18	12	30	6	4	10	24	16	40
Sheep and goat rearing	4	43	20	63	5	5	10	48	25	73
Poultry production	14	170	95	265	33	70	103	203	165	368
Ornamental fisheries	5	23	9	32	1	1	2	24	10	34
Others	90	1268	990	2258	135	45	180	1403	1035	2438
<b>Total</b>	<b>245</b>	<b>6017</b>	<b>4170</b>	<b>10187</b>	<b>289</b>	<b>258</b>	<b>547</b>	<b>6306</b>	<b>4428</b>	<b>10734</b>

Others includes training areas such as Nutri Garden, RAWE, Micro irrigation, Plant propagation, Entrepreneurial development, Awareness on farm bill, Crop diversification, floriculture, INM, IPDM, Leadership development, Organic farming, Production of horticulture, Soil and water conservation and Weed management.

**Table 69: Area wise capacity development courses conducted for rural youth by KVKs of Lakshadweep**

Capacity development area	Capacity development courses (No.)	Participant rural youth (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Nursery Management of Horticulture crops	1	0	0	0	0	23	23	0	23	23
Value addition	3	0	0	0	0	30	30	0	30	30
Quail farming	2	0	0	0	0	23	23	0	23	23
<b>Total</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>76</b>	<b>76</b>	<b>0</b>	<b>76</b>	<b>76</b>

### 3.1.3.3 Extension personnel

#### (a) State wise

Capacity development courses organized for extension personnel by KVKs in the zone are presented in Table 70. Data indicated that a total of 201 capacity development courses were conducted and trained 8475 extension personnel (3748 male and 4727 female) of which 6800 (3123 male and 3677 female) were general and 1675 (625 male and 1050 female) were SC/ST. KVKs of Karnataka have organized 156 capacity development courses and trained 6936 extension personnel (3164 male and 3772 female) of which 5390 (2573 male and 2817 female) were general and 1546 (591 male and 955 female) were SC/ST. KVKs of Kerala

have organized 44 capacity development courses and trained 1529 extension personnel (577 male and 952 female) of which 1410 (550 male and 860 female) were general and 119 (27 male and 92 female) were SC/ST. KVK, Lakshadweep organized one capacity development course and trained 10 extension personnel (7 male and 3 female) belonging to SC/ST.

#### (b) Area wise

Capacity development courses conducted for extension personnel on different capacity development areas by KVKs in the Zone are presented in Table 71. Data shows that out of 201 courses conducted for 8475 extension personnel, others (Value addition, Precision farming,

**Table 70: Statewise capacity development courses conducted for extension personnel by KVKs in Zone XI**

State	Capacity development courses (No.)	Extension personnel (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	156	2573	2817	5390	591	955	1546	3164	3772	6936
Kerala	44	550	860	1410	27	92	119	577	952	1529
Lakshadweep	1	0	0	0	7	3	10	7	3	10
<b>Total</b>	<b>201</b>	<b>3123</b>	<b>3677</b>	<b>6800</b>	<b>625</b>	<b>1050</b>	<b>1675</b>	<b>3748</b>	<b>4727</b>	<b>8475</b>

**Table 71: Area wise capacity development courses conducted for extension personnel by KVKs in Zone-XI**

Capacity development area	Capacity development courses (No.)	Participant extension personnel (No.)								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	13	323	110	433	44	37	81	367	147	514
Integrated Pest Management	20	290	202	492	86	89	175	376	291	667
Integrated Nutrient Management	14	314	103	417	42	88	130	356	191	547
Protected cultivation technology	2	12	59	71	2	34	36	14	93	107
Production and use of organic inputs	6	136	9	145	7	8	15	143	17	160
Care and maintenance of farm machinery and implements	1	15	6	21	0	0	0	15	6	21
Formation and management of SHGs	6	47	72	119	7	32	39	54	104	158
Women and child care	29	82	1024	1106	17	356	373	99	1380	1479
Low cost and nutrient efficient diet designing	11	64	369	433	12	48	60	76	417	493
Group dynamics and farmers organization	2	80	0	80	17	0	17	97	0	97
Capacity building for ICT application	11	245	78	323	43	82	125	288	160	448
Management in farm animals	4	158	35	193	21	12	33	179	47	226
Livestock feed and fodder production	11	280	21	301	85	5	90	365	26	391
Household food security	25	183	936	1119	38	128	166	221	1064	1285
Others	46	894	653	1547	204	131	335	1098	784	1882
<b>Total</b>	<b>201</b>	<b>3123</b>	<b>3677</b>	<b>6800</b>	<b>625</b>	<b>1050</b>	<b>1675</b>	<b>3748</b>	<b>4727</b>	<b>8475</b>

*Others includes training areas such as Value addition, Precision farming, AGMARK, IFS, Soil fertility, Awareness on farm bill, Minimum cost diet, Value addition, Processing, FPO formation, Disease management in animals, Bird flu, Artificial insemination, Climate change, Weather forecast, Capacity building for input dealers and Value addition.*

AGMARK, IFS, Soil fertility, Awareness on farm bill, Minimum cost diet, Value addition, Processing, FPO formation, Disease management in animals, Bird flu, Artificial insemination, Climate change, Weather forecast, Capacity building for input dealers and Value addition) with 46 courses was the major area with the

participation of 1882 extension personnel followed by women and child care (29), household food security (25) and so on. Details on area wise capacity development courses conducted for extension personnel by KVKs of Karnataka and Kerala are presented in Tables 72 and 73, respectively.

**Table 72: Area wise capacity development courses conducted for extension personnel by KVKs of Karnataka**

Capacity development area	Capacity development courses (No.)	Participant extension personnel (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	11	291	72	363	37	35	72	328	107	435
Integrated Pest Management	18	290	157	447	86	84	170	376	241	617
Integrated Nutrient Management	11	195	100	295	42	88	130	237	188	425
Protected cultivation technology	2	12	59	71	2	34	36	14	93	107
Production and use of organic inputs	4	56	7	63	7	8	15	63	15	78
Care and maintenance of farm machinery and implements	1	15	6	21	0	0	0	15	6	21
Formation and management of SHGs	6	47	72	119	7	32	39	54	104	158
Women and child care	27	70	991	1061	16	325	341	86	1316	1402
Low cost and nutrient efficient diet designing	6	36	282	318	10	48	58	46	330	376
Group dynamics and farmers organization	2	80	0	80	17	0	17	97	0	97
Capacity building for ICT application	8	235	52	287	42	82	124	277	134	411
Management in farm animals	4	158	35	193	21	12	33	179	47	226
Livestock feed and fodder production	10	277	21	298	83	5	88	360	26	386
Household food security	21	128	744	872	31	116	147	159	860	1019
Others	25	683	219	902	190	86	276	873	305	1178
<b>Total</b>	<b>156</b>	<b>2573</b>	<b>2817</b>	<b>5390</b>	<b>591</b>	<b>955</b>	<b>1546</b>	<b>3164</b>	<b>3772</b>	<b>6936</b>

*Others includes training areas such as FPO formation, Disease management in animals, Bird flu, Artificial insemination, Climate change, Weather forecast, Capacity building for input dealers and Value addition.*



Capacity development course on IFS in coastal Karnataka for extension personnel (KVK, Dakshina Kannada)



Capacity development course on recent trends in sugarcane cultivation for extension personnel (KVK, Belagavi- II)

**Table 73: Area wise capacity development courses conducted for extension personnel by KVKs of Kerala**

Capacity development area	Capacity development courses (No.)	Participant extension personnel (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Productivity enhancement in field crops	2	32	38	70	7	2	9	39	40	79
Integrated Pest Management	2	0	45	45	0	5	5	0	50	50
Integrated Nutrient Management	3	119	3	122	0	0	0	119	3	122
Production and use of organic inputs	2	80	2	82	0	0	0	80	2	82
Women and child care	2	12	33	45	1	31	32	13	64	77
Low cost and nutrient efficient diet designing	5	28	87	115	2	0	2	30	87	117
Capacity building for ICT application	3	10	26	36	1	0	1	11	26	37
Livestock feed and fodder production	1	3	0	3	2	0	2	5	0	5
Household food security	4	55	192	247	7	12	19	62	204	266
Others	20	211	434	645	7	42	49	218	476	694
<b>Total</b>	<b>44</b>	<b>550</b>	<b>860</b>	<b>1410</b>	<b>27</b>	<b>92</b>	<b>119</b>	<b>577</b>	<b>952</b>	<b>1529</b>

*Others includes training areas such as Value addition, Precision farming, AGMARK, IFS, Soil fertility, Awareness on farm bill, Minimum cost diet Value addition and Processing*

### 3.1.3.4 Sponsored capacity development courses

#### (a) State wise

KVKs in the Zone conducted sponsored capacity development courses which are presented state wise in Table 74. Data revealed that a total of 521 sponsored capacity development courses were organized and trained 19039 participants (14136 male and 4903 female) of which 16426 (12610 male and 3816 female) were general and 2613 (1526 male and 1087 female) were SC/ST. KVKs of Karnataka have organized 219 sponsored capacity development courses and trained 8093 participants (6214 male and 1879 female) of which 6411 (5076 male and 1335 female) were general and 1682 (1138 male and 544 female) were SC/ST. KVKs of Kerala have organized 302 sponsored capacity development courses and trained 10946 participants (7922 male and 3024 female) of which 10015 (7534 male and 2481 female) were general and 931 (388 male and 543 female) were SC/ST.

#### (b) Area wise

Sponsored capacity development courses conducted on

different areas by KVKs in Zone XI are presented in Table 75. Data indicated that a total of 521 sponsored training courses were conducted besides the regular capacity development courses wherein trained 19039 participants. More number of sponsored capacity development courses (96) were conducted on increasing production and productivity of crops with 4593 participants. Other capacity development areas (Quality control, DAESI, Nutrition garden, Mushroom cultivation, Beyond jack, Wild boar management, INM, Pulse production technologies, Nursery Management, MGNREGA, FOCT, Bee keeping and LRI) under Agricultural Extension together contributed for 93 programmes and 2147 participants. Soil health and fertility management with 57 courses and 2345 participants was also an important area of capacity development.

Area wise sponsored training courses conducted by KVKs of Karnataka and Kerala are presented in Tables 76 and 77 respectively.

**Table 74: Statewise sponsored capacity development courses conducted by KVKs in Zone XI**

State	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	219	5076	1335	6411	1138	544	1682	6214	1879	8093
Kerala	302	7534	2481	10015	388	543	931	7922	3024	10946
<b>Total</b>	<b>521</b>	<b>12610</b>	<b>3816</b>	<b>16426</b>	<b>1526</b>	<b>1087</b>	<b>2613</b>	<b>14136</b>	<b>4903</b>	<b>19039</b>

**Table 75: Area wise sponsored capacity development courses conducted by KVKs in Zone XI**

Capacity development area	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>Crop production and management</b>										
Increasing production and productivity of crops	96	3577	491	4068	431	94	525	4008	585	4593
Commercial production of vegetables	8	178	128	306	26	11	37	204	139	343
<b>Production and value addition</b>										
Fruit Plants	21	806	150	956	37	8	45	843	158	1001
Ornamental plants	4	63	42	105	0	3	3	63	45	108
Spices crops	2	41	2	43	16	2	18	57	4	61
Soil health and fertility management	57	1633	347	1980	314	51	365	1947	398	2345
Production of inputs at site	13	127	98	225	37	49	86	164	147	311
Methods of protective cultivation	19	615	63	678	65	25	90	680	88	768
Others	48	1055	350	1405	130	81	211	1185	431	1616
<b>Post harvest technology and value addition</b>										
Processing and value addition	19	252	175	427	50	92	142	302	267	569
Others	8	104	79	183	17	25	42	121	104	225
<b>Farm machinery</b>										
Farm machinery, tools and implements	8	123	51	174	27	9	36	150	60	210
Others	8	221	43	264	31	12	43	252	55	307
<b>Livestock production and management</b>										
Animal Nutrition Management	13	166	59	225	46	36	82	212	95	307
Animal Disease Management	1	30	4	34	0	0	0	30	4	34
Fisheries nutrition	1	34	8	42	14	3	17	48	11	59
Fisheries management	3	80	10	90	18	3	21	98	13	111
Others	5	34	20	54	5	74	79	39	94	133
<b>Home Science</b>										
Household nutritional security	20	255	494	749	35	167	202	290	661	951
Economic empowerment of women	10	45	118	163	9	43	52	54	161	215
Drudgery reduction of women	1	5	35	40	2	13	15	7	48	55
Others	31	912	383	1295	57	116	173	969	499	1468
Capacity Building and Group Dynamics	32	765	184	949	63	90	153	828	274	1102
<b>Agricultural Extension</b>	93	1489	482	1971	96	80	176	1585	562	2147
<b>Total</b>	<b>521</b>	<b>12610</b>	<b>3816</b>	<b>16426</b>	<b>1526</b>	<b>1087</b>	<b>2613</b>	<b>14136</b>	<b>4903</b>	<b>19039</b>

Other sponsored capacity development courses under Agricultural Extension includes Quality control, DAESI, Nutrition garden, Mushroom cultivation, Beyond jack, Wild boar management, INM, Pulse production technologies, Nursery Management, MGNREGA, FOCT, Bee keeping and LRI.



Sponsored capacity development course on sheep and goat farming (KVK, Dharwad)



Sponsored capacity development course on piggyery (KVK, Kodagu)

**Table 76: Area wise sponsored capacity development courses conducted by KVKs of Karnataka**

Capacity development area	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>Crop production and management</b>										
Increasing production and productivity of crops	49	1359	164	1523	354	23	377	1713	187	1900
Commercial production of vegetables	5	109	80	189	23	11	34	132	91	223
<b>Production and value addition</b>										
Fruit plants	12	407	105	512	35	3	38	442	108	550
Ornamental plants	0	0	0	0	0	0	0	0	0	0
Spices crops	1	1	2	3	16	2	18	17	4	21
Soil health and fertility management	45	1282	219	1501	281	33	314	1563	252	1815
Production of inputs at site	7	98	51	149	11	25	36	109	76	185
Methods of protective cultivation	5	91	17	108	44	8	52	135	25	160
Others	13	300	87	387	67	42	109	367	129	496
<b>Post harvest technology and value addition</b>										
Processing and value addition	4	35	15	50	24	29	53	59	44	103
Others	6	70	49	119	13	8	21	83	57	140
<b>Farm machinery</b>										
Farm machinery, tools and implements	2	62	0	62	19	0	19	81	0	81
Others	3	108	7	115	24	1	25	132	8	140
<b>Livestock and fisheries</b>										
Animal nutrition management	8	105	22	127	27	17	44	132	39	171
Animal disease management	1	30	4	34	0	0	0	30	4	34
Fisheries nutrition	1	34	8	42	14	3	17	48	11	59
Fisheries management	2	59	8	67	17	3	20	76	11	87
Others	3	16	0	16	4	73	77	20	73	93
<b>Home Science</b>										
Household nutritional security	8	54	221	275	26	82	108	80	303	383
Economic empowerment of women	1	7	4	11	7	2	9	14	6	20
Drudgery reduction of women	1	5	35	40	2	13	15	7	48	55
Others	7	216	31	247	26	29	55	242	60	302
<b>Agricultural Extension</b>										
Capacity building and group dynamics	13	161	97	258	36	73	109	197	170	367
Others	22	467	109	576	68	64	132	535	173	708
<b>Total</b>	<b>219</b>	<b>5076</b>	<b>1335</b>	<b>6411</b>	<b>1138</b>	<b>544</b>	<b>1682</b>	<b>6214</b>	<b>1879</b>	<b>8093</b>

Other sponsored capacity development courses under Agricultural Extension includes Nursery management, MGNREGA, FOCT, Bee keeping and LRI)



**Table 77: Area wise sponsored capacity development courses conducted by KVKs of Kerala**

Capacity development area	Capacity development courses (No.)	Participants (No.)									
		General			SC/ST			Grand total			
		Male	Female	Total	Male	Female	Total	Male	Female	Total	
<b>Crop production and management</b>											
Increasing production and productivity of crops	47	2218	327	2545	77	71	148	2295	398	2693	
Commercial production of vegetables	3	69	48	117	3	0	3	72	48	120	
<b>Production and value addition</b>											
Fruit plants	9	399	45	444	2	5	7	401	50	451	
Ornamental plants	4	63	42	105	0	3	3	63	45	108	
Spices crops	1	40	0	40	0	0	0	40	0	40	
Soil health and fertility management	12	351	128	479	33	18	51	384	146	530	
Production of Inputs at site	6	29	47	76	26	24	50	55	71	126	
Methods of protective cultivation	14	524	46	570	21	17	38	545	63	608	
Others	35	755	263	1018	63	39	102	818	302	1120	
<b>Post harvest technology and value addition</b>											
Processing and value addition	15	217	160	377	26	63	89	243	223	466	
Others	2	34	30	64	4	17	21	38	47	85	
<b>Farm machinery</b>											
Farm machinery, tools and implements	6	61	51	112	8	9	17	69	60	129	
Others	5	113	36	149	7	11	18	120	47	167	
<b>Livestock and fisheries</b>											
Animal nutrition management	5	61	37	98	19	19	38	80	56	136	
Animal disease management	0	0	0	0	0	0	0	0	0	0	
Fisheries nutrition	0	0	0	0	0	0	0	0	0	0	
Fisheries management	1	21	2	23	1	0	1	22	2	24	
Others	2	18	20	38	1	1	2	19	21	40	
<b>Home Science</b>											
Household nutritional security	12	201	273	474	9	85	94	210	358	568	
Economic empowerment of women	9	38	114	152	2	41	43	40	155	195	
Drudgery reduction of women	0	0	0	0	0	0	0	0	0	0	
Others	24	696	352	1048	31	87	118	727	439	1166	
<b>Agricultural Extension</b>											
Capacity building and group dynamics	19	604	87	691	27	17	44	631	104	735	
Others	71	1022	373	1395	28	16	44	1050	389	1439	
<b>Total</b>	<b>302</b>	<b>7534</b>	<b>2481</b>	<b>10015</b>	<b>388</b>	<b>543</b>	<b>931</b>	<b>7922</b>	<b>3024</b>	<b>10946</b>	
Other sponsored capacity development courses under Agricultural Extension includes Nursery management, MGNREGA, FOCT, Bee keeping and LRI											

### 3.1.3.5 Vocational capacity development courses

#### (a) Statewise

Vocational capacity development courses conducted by KVKs in the Zone are presented state wise in Table 78. Data shows that a total of 112 vocational capacity development courses were organized and trained 9379 participants (5205 male and 4174 female) of which 8833 (4803 male and 4030 female) were general and 546 (402 male and 144 female) were SC/ST. KVKs of Karnataka have organized 61 vocational capacity development

courses for 1631 participants (1391 male and 240 female) of which 1214 (1034 male and 180 female) were general and 417 (357 male and 60 female) were SC/ST. KVKs of Kerala have organized 51 vocational capacity development courses and trained 7748 participants (3814 male and 3934 female) of which 7619 (3769 male and 3850 female) were general and 129 (45 male and 84 female) were SC/ST.

## (b) Area wise

This is an important area of capacity development where the focus is to impart skills and enable the trainees to earn or supplement his/her livelihood, in this regard vocational capacity development courses conducted on different areas by KVKs in the Zone are presented in Table 79. Data indicated that a total of 112 capacity development courses were conducted by involving 9379

potential entrepreneurs. Among the different vocations, sheep and goat rearing was the major area of training (13 courses and 452 participants) followed by dairy farming (11 courses and 308 participants).

Details of area wise vocational capacity development courses conducted by KVKs of Karnataka and Kerala are presented in Tables 80 and 81 respectively.

**Table 78: State wise vocational capacity development courses conducted by KVKs in Zone XI**

State	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	61	1034	180	1214	357	60	417	1391	240	1631
Kerala	51	3769	3850	7619	45	84	129	3814	3934	7748
<b>Total</b>	<b>112</b>	<b>4803</b>	<b>4030</b>	<b>8833</b>	<b>402</b>	<b>144</b>	<b>546</b>	<b>5205</b>	<b>4174</b>	<b>9379</b>

**Table 79: Area wise vocational capacity development courses conducted by KVKs in Zone-XI**

Capacity development area	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>Crop production and management</b>										
Commercial floriculture	10	90	110	200	19	17	36	109	127	236
Integrated crop management	7	56	5	61	32	5	37	88	10	98
Organic farming	4	39	8	47	35	6	41	74	14	88
Others	4	40	33	73	0	0	0	40	33	73
<b>Post harvest technology and value addition</b>										
Value addition	3	5	18	23	16	5	21	21	23	44
Others	1	6	20	26	1	3	4	7	23	30
<b>Livestock and fisheries</b>										
Dairy farming	11	145	93	238	37	33	70	182	126	308
Composite fish culture	1	0	0	0	15	0	15	15	0	15
Sheep and goat rearing	13	317	25	342	104	6	110	421	31	452
Others	8	131	90	221	38	13	51	169	103	272
<b>Income generation activities</b>										
Vermi-composting	3	73	0	73	11	0	11	84	0	84
Production of bio-agents, bio-pesticides and bio-fertilizers	5	2	16	18	0	2	2	2	18	20
Rural crafts	6	69	50	119	6	4	10	75	54	129
Mushroom cultivation	4	32	15	47	3	5	8	35	20	55
Tailoring, stitching, embroidery and dyeing	6	1799	1752	3551	26	23	49	1825	1775	3600
Agriculture para-workers and para-vet	9	1845	1766	3611	20	21	41	1865	1787	3652
<b>Agricultural extension</b>										
Capacity building and group dynamics	3	85	0	85	18	0	18	103	0	103
Others	10	21	17	38	20	0	20	41	17	58
<b>Total</b>	<b>112</b>	<b>4803</b>	<b>4030</b>	<b>8833</b>	<b>402</b>	<b>144</b>	<b>546</b>	<b>5205</b>	<b>4174</b>	<b>9379</b>

**Table 80: Area wise occasional capacity development courses conducted by KVKs of Karnataka**

Capacity development area	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>Crop production and management</b>										
Commercial floriculture	1	14	1	15	5	0	5	19	1	20
Integrated crop management	7	56	5	61	32	5	37	88	10	98
Organic farming	4	39	8	47	35	6	41	74	14	88
<b>Post harvest technology and value addition</b>										
Value addition	2	2	7	9	16	5	21	18	12	30
<b>Livestock and fisheries</b>										
Dairy farming	11	145	93	238	37	33	70	182	126	308
Composite fish culture	1	0	0	0	15	0	15	15	0	15
Sheep and goat rearing	13	317	25	342	104	6	110	421	31	452
Others	2	95	2	97	34	1	35	129	3	132
<b>Income generation activities</b>										
Vermi-composting	3	73	0	73	11	0	11	84	0	84
Mushroom cultivation	1	12	0	12	3	0	3	15	0	15
Tailoring, stitching, embroidery and dyeing	3	59	27	86	16	3	19	75	30	105
Agriculture para-workers and para-vet	3	99	12	111	10	1	11	109	13	122
<b>Agricultural extension</b>										
Capacity building and group dynamics	3	85	0	85	18	0	18	103	0	103
Others	6	15	0	15	20	0	20	35	0	35
<b>Total</b>	<b>61</b>	<b>1034</b>	<b>180</b>	<b>1214</b>	<b>357</b>	<b>60</b>	<b>417</b>	<b>1391</b>	<b>240</b>	<b>1631</b>

**Table 81: Area wise vocational capacity development courses conducted by KVKs of Kerala**

Capacity development area	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>Crop production and management</b>										
Commercial floriculture	9	76	109	185	14	17	31	90	126	216
Others	4	40	33	73	0	0	0	40	33	73
<b>Post harvest technology and value addition</b>										
Value addition	1	3	11	14	0	0	0	3	11	14
Others	1	6	20	26	1	3	4	7	23	30
<b>Livestock and fisheries</b>										
Others	6	36	88	124	4	12	16	40	100	140
<b>Income generation activities</b>										
Production of bio-agents and bio-pesticides	5	2	16	18	0	2	2	2	18	20
Repair and maintenance of farm machinery and implements	6	69	50	119	6	4	10	75	54	129
Seed production	3	20	15	35	0	5	5	20	20	40
Mushroom cultivation	3	1740	1725	3465	10	20	30	1750	1745	3495
Nursery and grafting	6	1746	1754	3500	10	20	30	1756	1774	3530
Others	3	25	12	37	0	1	1	25	13	38
<b>Agricultural Extension</b>										
Others	4	6	17	23	0	0	0	6	17	23
<b>Total</b>	<b>51</b>	<b>3769</b>	<b>3850</b>	<b>7619</b>	<b>45</b>	<b>84</b>	<b>129</b>	<b>3814</b>	<b>3934</b>	<b>7748</b>



Pro tray nursery demonstration (KVK, Uttar Kannada)



Vocational course on sericulture (KVK, Ramanagara)

### 3.1.3.6 On and off campus capacity development courses

#### (a) On campus

State wise on campus capacity development courses conducted by KVKs in the Zone under different categories of capacity development are furnished in Table 82. Data indicated that a total of 2956 on campus training courses were organized for 231819 participants (193013 male and 38806 female) of which 215895 (183247 male and 32648 female) were general and 15924 (9767 male and 6157 female) were SC/ST. Out of which 1845 capacity development courses were organized for 187389 farmers and farm women, 330 capacity development courses for 9560 rural youth, 148 capacity development courses for 6452 extension

personnel, 521 sponsored capacity development courses for 19039 participants and 112 vocational capacity development courses for 9379 budding entrepreneurs. State wise and participant wise data could be seen in Table 82.

#### (b) Off campus

State wise off campus capacity development courses conducted by KVKs of Zone-XI under different categories of capacity development are furnished in Table 83. Data indicated that a total of 1862 off campus capacity development courses were organized and trained 70589 participants (49582 male and 21007 female) of which 60364 (42979 male and 17385 female) were general and 10225 (6603 male and 3622 female) were SC/ST. Out of which 1699 capacity development

**Table 82: State wise on campus capacity development courses conducted by KVKs in Zone-XI**

Capacity development area	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>(i) Farmers and farm women</b>										
Karnataka	1137	22898	7314	30212	5712	2414	8126	28609	9729	38338
Kerala	690	135212	11634	146846	873	942	1815	136085	12576	148661
Lakshadweep	18	0	0	0	56	334	390	56	334	390
<b>Total</b>	<b>1845</b>	<b>158110</b>	<b>18948</b>	<b>177058</b>	<b>6641</b>	<b>3690</b>	<b>10331</b>	<b>164750</b>	<b>22639</b>	<b>187389</b>
<b>(ii) Rural youth</b>										
Karnataka	118	2317	657	2974	523	186	709	2840	843	3683
Kerala	206	2948	2464	5412	205	184	389	3153	2648	5801
Lakshadweep	6	0	0	0	0	76	76	0	76	76
<b>Total</b>	<b>330</b>	<b>5265</b>	<b>3121</b>	<b>8386</b>	<b>728</b>	<b>446</b>	<b>1174</b>	<b>5993</b>	<b>3567</b>	<b>9560</b>
<b>(iii) Extension personnel</b>										
Karnataka	115	2025	2116	4141	452	746	1198	2477	2862	5339
Kerala	33	434	617	1051	18	44	62	452	661	1113
<b>Total</b>	<b>148</b>	<b>2459</b>	<b>2733</b>	<b>5192</b>	<b>470</b>	<b>790</b>	<b>1260</b>	<b>2929</b>	<b>3523</b>	<b>6452</b>
<b>(iv) Sponsored training courses</b>										
Karnataka	219	5076	1335	6411	1138	544	1682	6214	1879	8093
Kerala	302	7534	2481	10015	388	543	931	7922	3024	10946
<b>Total</b>	<b>521</b>	<b>12610</b>	<b>3816</b>	<b>16426</b>	<b>1526</b>	<b>1087</b>	<b>2613</b>	<b>14136</b>	<b>4903</b>	<b>19039</b>
<b>(v) Vocational training courses</b>										
Karnataka	61	1034	180	1214	357	60	417	1391	240	1631
Kerala	51	3769	3850	7619	45	84	129	3814	3934	7748
<b>Total</b>	<b>112</b>	<b>4803</b>	<b>4030</b>	<b>8833</b>	<b>402</b>	<b>144</b>	<b>546</b>	<b>5205</b>	<b>4174</b>	<b>9379</b>
<b>Zone-XI</b>										
Karnataka	1650	33350	11602	44952	8182	3950	12132	41531	15553	57084
Kerala	1282	149897	21046	170943	1529	1797	3326	151426	22843	174269
Lakshadweep	24	0	0	0	56	410	466	56	410	466
<b>Total</b>	<b>2956</b>	<b>183247</b>	<b>32648</b>	<b>215895</b>	<b>9767</b>	<b>6157</b>	<b>15924</b>	<b>193013</b>	<b>38806</b>	<b>231819</b>

courses were organized for 61861 farmers and farm women, 110 capacity development courses for 6705 rural youth and 53 capacity development courses for 2023 extension personnel. State wise and participant wise data could be seen in Table 83.

### 3.1.4 Frontline Extension Activities

KVKs in the Zone organized different extension activities like advisory services, animal health camps, celebration of important days, diagnostic visits, exhibitions, exposure visits, ex-trainees sammelans, farm science club conveners meetings, farmers seminars, farmers visit to KVK, field days, film shows, group meetings, kisan ghosthies, kisan melas, lectures

delivered as resource persons, mahila mandals conveners meetings, method demonstrations, plant health camps, scientists visit to farmers field, Self Help Group conveners meetings, soil health camps, workshops and other extension services to create awareness among farmers, extension personnel, other stakeholders and public about various latest technologies in agriculture and allied sectors. Details of extension activities organised by KVKs during the reporting year are discussed below.

#### (a) State wise

Extension activities carried out by KVKs in Zone-XI are presented in Table - 84. Data indicates that 1.11 lakh

**Table 83: State wise off campus capacity development courses conducted by KVKs in Zone XI**

Capacity development area	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
<b>(i) Farmers and farm women</b>										
Karnataka	1350	24507	8124	32631	5558	2339	7897	30065	10463	40528
Kerala	345	13541	6339	19880	558	745	1303	14099	7084	21183
Lakshadweep	4	0	0	0	27	123	150	27	123	150
<b>Total</b>	<b>1699</b>	<b>38048</b>	<b>14463</b>	<b>52511</b>	<b>6143</b>	<b>3207</b>	<b>9350</b>	<b>44191</b>	<b>17670</b>	<b>61861</b>
<b>(ii) Rural youth</b>										
Karnataka	71	1198	272	1470	221	81	302	1419	353	1772
Kerala	39	3069	1706	4775	84	74	158	3153	1780	4933
<b>Total</b>	<b>110</b>	<b>4267</b>	<b>1978</b>	<b>6245</b>	<b>305</b>	<b>155</b>	<b>460</b>	<b>4572</b>	<b>2133</b>	<b>6705</b>
<b>(iii) Extension personnel</b>										
Karnataka	41	548	701	1249	139	209	348	687	910	1597
Kerala	11	116	243	359	9	48	57	125	291	416
Lakshadweep	1	0	0	0	7	3	10	7	3	10
<b>Total</b>	<b>53</b>	<b>664</b>	<b>944</b>	<b>1608</b>	<b>155</b>	<b>260</b>	<b>415</b>	<b>819</b>	<b>1204</b>	<b>2023</b>
<b>Zone-XI</b>										
Karnataka	1462	26253	9097	35350	5918	2629	8547	32171	11726	43897
Kerala	395	16726	8288	25014	651	867	1518	17377	9155	26532
Lakshadweep	5	0	0	0	34	126	160	34	126	160
<b>Total</b>	<b>1862</b>	<b>42979</b>	<b>17385</b>	<b>60364</b>	<b>6603</b>	<b>3622</b>	<b>10225</b>	<b>49582</b>	<b>21007</b>	<b>70589</b>

**Table 84: Extension activities carried out by KVKs in Zone XI**

State	Programmes (No.)	Farmers (No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Karnataka	66856	751632	111059	862691	73434	27610	101044	963735	22604	8229	30853
Kerala	43745	143819	71233	215052	17892	10398	28150	243202	3051	2710	5770
Lakshadweep	792	0	0	0	731	637	1368	1368	14	11	25
<b>Total</b>	<b>111393</b>	<b>895451</b>	<b>182292</b>	<b>1077743</b>	<b>92057</b>	<b>38645</b>	<b>130562</b>	<b>1208305</b>	<b>25669</b>	<b>10950</b>	<b>36648</b>

extension programmes were carried out by KVKs wherein 1208305 farmers (1077743 general farmers and 130562 SC/ST farmers) and 36648 extension personnel participated. State wise data shows that 66856 extension programmes were conducted by 33 KVKs of Karnataka with the participation of 963735 farmers and 30853 extension personnel. In Kerala 43745 extension programmes were organized by the KVKs with the participation of 243202 farmers and 5770 extension personnel. In Lakshadweep, 792 extension programmes were organized by KVK, Lakshadweep with the participation of 1368 farmers and 25 extension personnel.

### (b) Activity wise

Extension programmes on different activities conducted by KVKs of Karnataka, Kerala and Lakshadweep are presented in table 85, 86 and 87, respectively. From the table 85, data indicates that KVKs of Karnataka carried out more number of advisory services (38285) followed by farmers visit to KVKs (18597), scientists visit to farmers fields (4466), lectures delivered as resource persons (1570), diagnostic visits (887), method demonstrations (807), celebration of important days (577), group meetings (499), film shows (308), field days (288), exposure visits (108), soil health camps (86), exhibitions (79), workshops (61), Self Help Group conveners meetings (60), animal health camps (46), kisan melas (36), farmers seminars (28), kisan ghosthies (28), plant health camps (11), ex-trainees sammelans (11), mahila mandals conveners meetings (10) and farm science club conveners meetings (8).

From the Table 86, data indicated that KVKs of Kerala carried out more number of advisory services (40929) followed by scientists visit to farmers fields (784), farmers visit to KVKs (535), diagnostic visits (317), method demonstrations (283), lectures delivered as resource persons (222), group meetings (197), celebration of important days (176), film shows (70), farmers seminars (47), field days (40), exposure visits (33), Self Help Group conveners meetings (27), soil health camps (20), exhibitions (19), workshops (17), ex-trainees sammelans (12), animal health camps (7), kisan ghosthies (6) and kisan melas (4).

Data presented in Table 87 indicate that KVK, Lakshadweep conducted 207 diagnostic visits followed by 207 farmers visit to KVK, 203 advisory services, 151 scientific visit to farmers fields, six Self Help Group conveners meetings, five film shows, nine celebrations of important days and four method demonstrations.

Data pertaining to extension activities organized by KVKs in the Zone are presented in Table 88 and it shows more number advisory services (79417) followed by farmers visit to KVKs (19339), scientists visit to farmers fields (5401), lectures delivered as resource persons (1792), diagnostic visits (1411), method demonstrations (1094), celebration of important days (762), group meetings (696), film shows (383), field days (328), exposure visits (141), soil health camps (106), exhibitions (98), Self Help Group conveners meetings (93), workshops (78), farmers seminars (75), animal health camps (53), kisan melas (40), kisan ghosthies (34), ex-trainees sammelans (23), plant health camps (11), mahila mandals conveners meetings (10) and farm science club conveners meetings (8).

### (c) Mass contact

Details on mass contact extension activities carried out by KVKs in the Zone are presented in Table 89. Data indicates that 3928 activities were carried out at Zone level which includes more number on newspaper coverage (2090) followed by radio talks (509), extension literature (406), popular articles (406), Research papers/abstracts (260), TV talks (229) and DVD/CD (28).

KVKs of Karnataka carried out 2753 activities of which more number on newspaper coverage (1298) followed by radio talks (387), extension literature (305), popular articles (312), research papers/abstracts (234), TV talks (192) and DVD/CD (25). In case of Kerala also, KVKs carried out 1162 activities of which more on newspaper coverage (789) followed by radio talks (115), extension literature (101), popular articles (91), research papers/abstracts (26), TV talks (37) and DVD/CD (3). KVK, Lakshadweep carried out 13 activities which includes seven radio talks, three newspaper coverage and three popular articles.



Live webcasting of PM Kissan Samman Nidhi (KVK, Kottayam)

**Table 85: Extension activities carried out by KVKs of Karnataka**

Extension activity	Programmes (No.)	Farmers (No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Advisory services	38285	26231	11834	38065	1492	586	2078	40143	282	68	350
Farmers visit to KVKs	18597	25888	5237	31125	3732	1184	4916	36041	1490	426	1916
Scientists visit to farmers fields	4466	13392	2635	16027	2443	757	3200	19227	1577	395	1972
Lectures delivered as resource persons	1570	33136	8241	41377	6330	2763	9093	50470	4859	1759	6618
Diagnostic visits	887	3695	714	4409	564	184	748	5157	648	275	923
Method demonstrations	807	9026	1919	10945	2356	753	3109	14054	1220	456	1676
Celebration of important days	577	185249	22467	207716	10046	6435	16481	224197	3069	1732	4801
Group meetings	499	5804	2130	7934	1402	540	1942	9876	633	380	1013
Film shows	308	8159	2422	10581	1924	860	2784	13365	602	230	832
Field days	288	6560	1245	7805	1648	497	2145	9950	609	262	871
Exposure visits	108	3339	603	3942	501	192	693	4635	901	510	1411
Soil health camps	86	4269	601	4870	779	198	977	5847	427	150	577
Exhibitions	79	219210	23580	242790	14623	4523	19146	261936	2015	555	2570
Workshops	61	2698	435	3133	614	180	794	3927	437	88	525
Self Help Group conveners meetings	60	149	724	873	73	220	293	1166	95	44	139
Animal health camps	46	2250	388	2638	679	297	976	3614	152	28	180
Kisan melas	36	197844	24142	221986	22998	6946	29944	251930	2899	496	3395
Farmers seminars	28	1559	828	2387	357	208	565	2952	240	172	412
Kisan ghosthies	28	2204	641	2845	507	186	693	3538	344	141	485
Plant health camps	11	606	73	679	127	19	146	825	23	9	52
Ex-trainees sammelans	11	256	29	285	154	9	163	448	4	5	9
Mahilamandals conveners meetings	10	18	151	169	5	43	48	217	3	26	29
Farm science club conveners meetings	8	90	20	110	80	30	110	220	75	22	97
<b>Total</b>	<b>66856</b>	<b>751632</b>	<b>111059</b>	<b>862691</b>	<b>73434</b>	<b>27610</b>	<b>101044</b>	<b>963735</b>	<b>22604</b>	<b>8229</b>	<b>30853</b>

Table 86: Extension activities carried out by KVKs of Kerala

Extension activity	Programmes (No.)	Farmers (No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Advisory Services	40929	27240	9601	36841	1927	1254	3041	39882	567	420	996
Scientific visit to farmers field	784	2054	1110	3164	298	257	555	3719	210	232	442
Farmers visit to KVK	535	25612	11705	37317	3773	3077	6850	44167	825	298	1123
Diagnostic visits	317	897	320	1217	157	63	220	1437	48	31	79
Method demonstrations	283	1589	1294	2883	178	213	391	3274	67	82	149
Lectures delivered as resource persons	222	4764	2235	6999	322	273	595	7594	98	99	197
Group meetings	197	1311	580	1891	119	227	346	2237	216	108	324
Celebration of important days	176	3830	3302	7132	996	611	1607	8739	403	818	1221
Film shows	70	2149	716	2865	148	115	263	3128	181	78	259
Farmers seminars	47	2086	1104	3190	550	394	944	4134	55	83	138
Field days	40	729	522	1251	72	67	139	1390	32	28	60
Exposure visits	33	436	297	733	134	88	222	955	27	23	50
Self Help Group conveners meetings	27	26	167	193	0	0	0	193	0	2	2
Soil health camps	20	1557	483	2040	40	22	62	2102	8	11	19
Exhibitions	19	62728	35733	98461	8911	3508	12419	110880	196	270	466
Workshops	17	354	359	713	21	49	70	783	57	76	133
Ex-trainees Sammelans	12	121	61	182	7	2	9	191	9	8	17
Animal health camps	7	211	124	335	13	11	24	359	30	13	43
Kisan ghosthies	6	90	50	140	15	12	27	167	2	11	13
Kisan melas	4	6035	1470	7505	211	155	366	7871	20	19	39
<b>Total</b>	<b>43745</b>	<b>143819</b>	<b>71233</b>	<b>215052</b>	<b>17892</b>	<b>10398</b>	<b>28150</b>	<b>243202</b>	<b>3051</b>	<b>2710</b>	<b>5770</b>

**Table 87: Extension activities carried out by KVK, Lakshadweep**

Extension activity	Programmes (No.)	Farmers (No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Diagnostic visits	207	0	0	0	180	27	207	207	0	0	0
Farmers visit to KVK	207	0	0	0	150	57	207	207	0	0	0
Advisory Services	203	0	0	0	153	50	203	203	0	0	0
Scientific visit to farmers field	151	0	0	0	125	26	151	151	0	0	0
Self Help Group Conveners meetings	6	0	0	0	0	113	113	113	0	0	0
Film shows	5	0	0	0	0	93	93	93	2	3	5
Celebration of important days (specify) and others	9	0	0	0	99	210	309	309	11	7	18
Method demonstrations	4	0	0	0	24	61	85	85	1	1	2
<b>Total</b>	<b>792</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>731</b>	<b>637</b>	<b>1368</b>	<b>1368</b>	<b>14</b>	<b>11</b>	<b>25</b>



Hindi Diwas celebration (KVK, Pathanamthitta)



World Food Day celebration (KVK, Chamarajanagara)



Mahila Kisan Diwas celebration (KVK, Bidar)



International Women's Day celebration (KVK, Belagavi-II)

**Table 88: Extension activities carried out by KVKs in Zone XI**

Extension activity	Programmes (No.)	Farmers(No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Advisory Services	79417	53471	21435	74906	3572	1890	5322	80228	849	488	1346
Farmers visit to KVKs	19339	51500	16942	68442	7655	4318	11973	80415	2315	724	3039
Scientists visit to farmers fields	5401	15446	3745	19191	2866	1040	3906	23097	1787	627	2414
Lectures delivered as resource persons	1792	37900	10476	48376	6652	3036	9688	58064	4957	1858	6815
Diagnostic visits	1411	4592	1034	5626	901	274	1175	6801	696	306	1002
Methods demonstrations	1094	10615	3213	13828	2558	1027	3585	17413	1288	539	1827
Celebration of important days	762	189079	25769	214848	11141	7256	18397	233245	3483	2557	6040
Group meetings	696	7115	2710	9825	1521	767	2288	12113	849	488	1337
Film shows	383	10308	3138	13446	2072	1068	3140	16586	785	311	1096
Field days	328	7289	1767	9056	1720	564	2284	11340	641	290	931
Exposure visits	141	3775	900	4675	635	280	915	5590	928	533	1461
Soil health camps	106	5826	1084	6910	819	220	1039	7949	435	161	596
Exhibitions	98	281938	59313	341251	23534	8031	31565	372816	2211	825	3036
Self Help Group conveners meetings	93	175	891	1066	73	333	406	1472	95	46	141
Workshops	78	3052	794	3846	635	229	864	4710	494	164	658
Farmers seminars	75	3645	1932	5577	907	602	1509	7086	295	255	550
Animal health camps	53	2461	512	2973	692	308	1000	3973	182	41	223
Kisan melas	40	203879	25612	229491	23209	7101	30310	259801	2919	515	3434
Kisan ghosthies	34	2294	691	2985	522	198	720	3705	346	152	498
Ex-trainees sammelans	23	377	90	467	161	11	172	639	13	13	26
Plant health camps	11	606	73	679	127	19	146	825	23	9	52
Mahilamandals conveners meetings	10	18	151	169	5	43	48	217	3	26	29
Farm science club conveners meetings	8	90	20	110	80	30	110	220	75	22	97
<b>Total</b>	<b>111393</b>	<b>895451</b>	<b>182292</b>	<b>1077743</b>	<b>92057</b>	<b>38645</b>	<b>130562</b>	<b>1208305</b>	<b>25669</b>	<b>10950</b>	<b>36648</b>

**Table 89: Extension activities carried out for mass contact by KVKs in Zone-XI**

Activity/Media type	Extension activities formass contact (No.)			
	Karnataka	Kerala	Lakshadweep	Total
Newspaper coverage	1298	789	3	2090
Radio talks	387	115	7	509
Extension literature	305	101	0	406
Popular articles	312	91	3	406
Research papers/abstracts	234	26	0	260
TV talks	192	37	0	229
DVD/CD	25	3	0	28
<b>Total</b>	<b>2753</b>	<b>1162</b>	<b>13</b>	<b>3928</b>



Animal Health Camp  
(KVK, Hassan)



Hon'ble Agricultural Minister,  
Shri V.S Sunilkumar at the Exhibition stall  
(KVK, Trivandrum)

### 3.1.5 Production of Technological Inputs

Timely availability of quality technological products such as seeds, planting material, livestock breeds and bio-products are essential to achieve the potential yield in agriculture and allied sectors. Keeping this in view, KVKs are actively involved in production of technological products and the details are given here under.

#### (a) Seeds

State and crop category wise seeds produced by KVKs are presented in Tables 90, 91, 92 and 93. Data in Table 90 indicated that a total of 2672.69 q of seeds of different crops were produced by KVKs in the Zone and supplied to 97626 farmers. Out of which, 2548.99 q seeds

produced by KVKs of Karnataka, 123.51 q seeds produced by KVKs of Kerala and 0.20 q seeds produced by KVK, Lakshadweep. Data in Table-91 revealed that KVKs of Karnataka produced more seeds of cereals (1290.78 q) followed by pulses (653.64 q), oilseeds (302.92 q), millets (191.18 q), fodder (51.05 q), vegetables (38.91 q) and green manure crops (20.50 q) and supplied to 45825 farmers. As per the data in Table-92, KVKs in Kerala produced more seeds of spices (48.78 q), followed by cereals (41.90 q), pulses (12.45 q), vegetables (12.06 q), tubers (8.10 q) and oilseeds (0.22 q) and supplied to 51594 farmers. Data on crop category wise production of seeds by KVKs in the Zone presented in Table 93 indicated that more quantity of

seeds were produced on cereals (1332.68 q) followed by pulses (666.09 q), oilseeds (303.14 q), millets (191.18 q), fodder (51.05 q), vegetables (50.97 q),

spices (48.78 q), green manures (20.50 q) and tubers (8.10 q). KVK, Lakshadweep produced 0.20 q of seeds on different vegetable crops and supplied to 207 farmers.

**Table 90: State wise production of seeds by KVKs in Zone XI**

State	Production of seeds		
	Quantity (q)	Worth (₹)	Farmers (No.)
Karnataka	2548.99	12138201	45825
Kerala	123.51	3953547	51594
Lakshadweep	0.20	24760	207
<b>Total</b>	<b>2672.69</b>	<b>16116508</b>	<b>97626</b>

**Table 91: Crop category wise production of seeds by KVKs of Karnataka**

Crop category	Production of seeds		
	Quantity (q)	Worth (₹)	Farmers (No.)
Cereals	1290.78	2218701	11109
Pulses	653.64	5059745	9440
Oilseeds	302.92	2257013	5751
Millets	191.18	802855	15080
Fodder	51.05	876759	2773
Vegetables	38.91	760628	1545
Green manures	20.50	162500	127
<b>Total</b>	<b>2548.99</b>	<b>12138201</b>	<b>45825</b>

**Table 92: Crop category wise production of seeds by KVKs of Kerala**

Crop category	Production of seeds		
	Quantity (q)	Worth (₹)	Farmers (No.)
Spices	48.78	491053	235
Cereals	41.90	170180	72
Pulses	12.45	80900	217
Vegetables	12.06	3186026	51001
Tubers	8.10	19888	49
Oilseeds	0.22	5500	20
<b>Total</b>	<b>123.51</b>	<b>3953547</b>	<b>51594</b>

**Table 93: Crop category wise production of seeds by KVKs in Zone XI**

Crop category	Production of seeds		
	Quantity (q)	Worth(₹)	Farmers (No.)
Cereals	1332.68	2388881	11181
Pulses	666.09	5140645	9657
Oilseeds	303.14	2262513	5771
Millets	191.18	802855	15080
Fodder	51.05	876759	2773
Vegetables	50.97	3946654	52546
Spices	48.78	491053	235
Green manures	20.50	162500	127
Tubers	8.10	19888	49
<b>Total</b>	<b>2672.49</b>	<b>16091748</b>	<b>97419</b>

**(b) Planting materials**

State and crop category wise planting materials produced by KVKs are presented in Tables 94, 95, 96 and 97. Data in Table 94 revealed that a total of 2516105 planting materials of different crops were produced by KVKs of Zone-XI and supplied to 78869 farmers. Out of which, 1467261 numbers of planting materials were produced by KVKs of Karnataka and 1048844 numbers of planting materials were produced by KVKs of Kerala. Data in Table 95 indicated that KVKs of Karnataka produced more number of planting materials of fodder (931940) followed by commercial (198700), plantation (123135), vegetables (85765), fruits (57966), spices (55026), flowers (6517), medicinal and aromatic (4147), forest (2419) and ornamental (1646) and provided to

21631 farmers. Whereas data in Table 96 revealed that KVKs of Kerala produced more number of planting materials of vegetables (549281) followed by fodder (215716), spices (153768), fruits (57203), plantation (53740), tubers (7025), ornamental (5729), medicinal and aromatic (3550), forest (1475) and flowers (1357) and supplied to 57238 farmers. Data on crop category wise production of planting materials presented in Table 97 revealed that more quantity of planting materials were produced on fodder (1147656), vegetables (635046), spices (208794), commercial (198700), plantation (176875), fruits (115169), flowers (7874), medicinal and aromatic (7697), ornamental (7375), tubers (7025) and forest (3894).

**Table 94: State wise production of planting materials by KVKs in Zone XI**

State	Production of planting materials		
	Quantity (No.)	Worth (₹)	Farmers (No.)
Karnataka	1467261	7833340	21631
Kerala	1048844	13874024	57238
<b>Total</b>	<b>2516105</b>	<b>21707364</b>	<b>78869</b>

**Table 95: Crop category wise production of planting materials by KVKs of Karnataka**

Crop category	Production of planting materials		
	Quantity (No.)	Worth (₹)	Farmers (No.)
Fodder	931940	1303444	5664
Commercial	198700	408800	118
Plantation	123135	2302317	2470
Vegetables	85765	582422	5429
Fruits	57966	2256633	3695
Spices	55026	781509	2582
Flowers	6517	67595	410
Medicinal and aromatic	4147	42735	822
Forest	2419	61770	239
Ornamental	1646	26115	202
<b>Total</b>	<b>1467261</b>	<b>7833340</b>	<b>21631</b>

**Table 96: Crop category wise production of planting materials by KVKs of Kerala**

Crop category	Production of planting materials		
	Quantity (No.)	Worth (₹)	Farmers (No.)
Vegetables	549281	1928973	22463
Fodder	215716	348620	2172
Spices	153768	3254127	11237
Fruits	57203	4606939	8757
Plantation	53740	3103625	7345
Tubers	7025	136780	1546
Ornamental	5729	174173	1985
Medicinal and aromatic	3550	251492	1020
Forest	1475	33115	313
Flowers	1357	36180	400
<b>Total</b>	<b>1048844</b>	<b>13874024</b>	<b>57238</b>

**Table 97: Crop category wise production of planting materials by KVKs in Zone-XI**

Crop category	Production of planting materials		
	Quantity (No.)	Worth (₹)	Farmers (No.)
Fodder	1147656	1652064	7836
Vegetables	635046	2511395	27892
Spices	208794	4035636	13819
Commercial	198700	408800	118
Plantation	176875	5405942	9815
Fruits	115169	6863572	12452
Flowers	7874	103775	810
Medicinal and aromatic	7697	294227	1842
Ornamental	7375	200288	2187
Tubers	7025	136780	1546
Forest	3894	94885	552
<b>Total</b>	<b>2516105</b>	<b>21707364</b>	<b>78869</b>

**(c) Hybrids**

State and crop category wise planting materials of crop hybrids produced by KVKs are presented in Table 98. Data revealed that a total of 399596 numbers of hybrid planting materials of different crops were produced by KVKs of Zone-XI and supplied to 9025 farmers. KVKs of Karnataka produced 239327 number of hybrid planting materials of which vegetables (226460) and

fruits (12867) and provided to 2533 farmers. Whereas KVKs of Kerala produced 160269 number of hybrid planting materials of which vegetables (155169) and fruits (5100) and supplied to 6492 farmers. Thus, KVKs in Zone-XI produced 381629 number of hybrid planting materials on vegetables and 17967 number of hybrid planting materials on fruits.

**Table 98: State and crop category wise production of hybrid planting materials by KVKs in Zone-XI**

State	Crop category	Production of hybrid planting materials		
		Quantity (No.)	Worth (₹)	Farmers (No.)
Karnataka	Vegetables	226460	511300	2260
	Fruits	12867	193005	273
	<b>Total</b>	<b>239327</b>	<b>704305</b>	<b>2533</b>
Kerala	Vegetables	155169	465507	5992
	Fruits	5100	153000	500
	<b>Total</b>	<b>160269</b>	<b>618507</b>	<b>6492</b>
<b>Zone -XI</b>	<b>Grand total</b>	<b>399596</b>	<b>1322812</b>	<b>9025</b>

#### (d) Bio-products

State and category wise bio-products produced by KVKs are presented in Tables 99, 100, 101, 102 and 103. Data in Table 99 indicated that a total of 4061.22 q of bio-products were produced by KVKs of Zone XI and supplied to 113678 farmers. Out of which, 2054.67 q of bio-products produced by KVKs of Karnataka, 2005.93 q of bio-products produced by KVKs of Kerala and 0.62 q of bio-products produced by KVK, Lakshadweep. Data in Table 100 showed that KVKs of Karnataka produced more quantity of bio-products related to bio-fertilisers (1365.02 q) followed by micro nutrient mixtures (420.79 q), bio-pesticides (92.29 q), bio-fungicides (90.63 q), organic manures (82.50 q), bio-agents (3.05 q) and mushroom spawn (0.41 q) and provided to 33247 farmers. Whereas data in Table 101 indicated that KVKs of Kerala produced more quantity of bio-products related to micro nutrient mixtures (670.18 q) followed by organic manures (473.58 q), bio - pesticides (423.38 q), bio - fertilizers

(208.90 q), bio-fungicides (185.16 q), bio-agents (42.51 q) and mushroom spawn (2.22 q) and supplied to 80381 farmers. KVK, Lakshadweep produced 0.62 q of fish-based bio-fertilizer and supplied to 50 farmers. Data on category wise bio-products produced by KVKs in the Zone presented in Table 102 revealed that more quantity of bio-products were produced on bio-fertilisers (1574.54 q) followed by micro nutrient mixtures (1090.96 q), organic manures (556.07 q), bio-pesticides (515.67 q), bio-fungicides (275.78), bio-agents (45.56 q) and mushroom spawn (2.63 q). From the Table 103, data indicated that KVKs in the Zone produced 196588 number of other bio-products of which KVKs of Karnataka produced 17841 (15649 Pheromone traps and 2192 Tricho cards) and KVKs of Kerala produced 178747 (9747 Pheromone traps and 169000 EPN) and supplied to 6556 farmers. As a whole, KVKs in the Zone produced 25396 Pheromone traps and supplied to 6178 farmers.

**Table 99: State wise production of bio-products by KVKs in Zone-XI**

State	Production of bio-products		
	Quantity (q)	Worth (₹)	Farmers (No.)
Karnataka	2054.67	13818878	33247
Kerala	2005.93	16221597	80381
Lakshadweep	0.62	4340	50
<b>Total</b>	<b>4061.22</b>	<b>30044815</b>	<b>113678</b>

**Table 100: Category wise production of bio-products by KVKs of Karnataka**

Bio-product category	Production of bio-products		
	Quantity (q)	Worth (₹)	Farmers (No.)
Bio-fertilisers	1365.02	2251352	14997
Micro nutrient mixtures	420.79	7550380	7849
Bio-pesticides	92.29	2192803	2763
Bio-fungicides	90.63	964690	3449
Organic manures	82.50	541738	3672
Bio-agents	3.05	175195	459
Mushroom spawn	0.41	142720	58
<b>Total</b>	<b>2054.67</b>	<b>13818878</b>	<b>33247</b>

**Table 101: Category wise production of bio-products by KVKs of Kerala**

Bio-product category	Production of bio-products		
	Quantity (q)	Worth (₹)	Farmers (No.)
Micro nutrient mixtures	670.18	3720563	7571
Organic manures	473.58	1125132	5894
Bio-pesticides	423.38	3985132	29985
Bio-fertilizers	208.90	2401381	14411
Bio-fungicides	185.16	3943098	20277
Bio-agents	42.51	315887	908
Mushroom spawn	2.22	730404	1335
<b>Total</b>	<b>2005.93</b>	<b>16221597</b>	<b>80381</b>

**Table 102: Category wise production of bio-products by KVKs in Zone-XI**

Bio-product category	Production of bio-products		
	Quantity (q)	Worth (₹)	Farmers (No.)
Bio-fertilisers	1574.54	4657073	29458
Micro nutrient mixtures	1090.96	11270943	15420
Organic manures	556.07	1666870	9566
Bio-pesticides	515.67	6177935	32748
Bio-fungicides	275.78	4907788	23726
Bio-agents	45.56	491082	1367
Mushroom spawn	2.63	873124	1393
<b>Total</b>	<b>4061.22</b>	<b>30044815</b>	<b>113678</b>

**Table 103: Production of other bio-products by KVKs in Zone-XI**

State	Bio-product category	Production of other bio-products		
		Quantity (q)	Worth (₹)	Farmers (No.)
Karnataka	Pheromone traps	15649	327180	1670
	Tricho cards	2192	54800	250
	Total	17841	381980	1920
Kerala	Pheromone traps	9747	1045268	4508
	EPN	169000	253500	128
	Total	178747	1298768	4636
<b>Zone-XI</b>	<b>Grand total</b>	<b>196588</b>	<b>1680748</b>	<b>6556</b>

### (e) Livestock and fisheries

State and category wise livestock and fisheries technological products produced by KVKs are presented in Tables 104, 105, 106 and 107. Data in Table 104 revealed that a total of 308389 numbers of livestock and fish fingerlings were produced by KVKs of Zone XI and supplied to 17341 farmers. Out of which, 108060 livestock and fish fingerlings produced by KVKs of Karnataka and 200329 livestock and fish fingerlings produced by KVKs of Kerala. Data in Table 105 indicated that KVKs of Karnataka produced more number of fish fingerlings (86625) followed by poultry (17475), poultry eggs (3532), piglets (272), sheep and

goat kids (121) and dairy (35) and provided to 3612 farmers. Whereas data in Table 106 revealed that KVKs of Kerala produced more number of fish fingerlings (152150) followed by poultry (44353), poultry eggs (3729) and goat kids (97) and supplied to 13729 farmers. Data on category wise production of livestock and fish fingerlings by KVKs in the Zone presented in Table 107 revealed that more numbers of fish fingerlings (238775) were produced followed by poultry birds (61828), poultry eggs (7261), piglets (272), sheep and goat kids (218) and dairy (35).

**Table 104: State wise production of livestock and fish fingerlings by KVKs in Zone-XI**

State	Production of livestock and fish fingerlings		
	Quantity (No.)	Worth (₹)	Farmers (No.)
Karnataka	108060	1584385	3612
Kerala	200329	2733771	13729
<b>Total</b>	<b>308389</b>	<b>4318156</b>	<b>17341</b>

**Table 105: Category wise production of livestock and fish fingerlings by KVKs of Karnataka**

Category	Production of livestock and fish fingerlings		
	Quantity (No.)	Worth (₹)	Farmers (No.)
Fish fingerlings	86625	433125	250
Poultry birds	17475	524250	2971
Poultry Eggs	3532	17660	215
Piglets	272	164600	89
Sheep and goat kids	121	60500	60
Dairy	35	384250	27
<b>Total</b>	<b>108060</b>	<b>1584385</b>	<b>3612</b>

**Table 106: Category wise production of livestock and fish fingerlings by KVKs of Kerala**

Category	Production of livestock and fish fingerlings		
	Quantity (No.)	Worth (₹)	Farmers (No.)
Fish Fingerlings	152150	1521500	3451
Poultry birds	44353	1108825	9864
Poultry eggs	3729	16146	323
Goat kids	97	87300	91
<b>Total</b>	<b>200329</b>	<b>2733771</b>	<b>13729</b>

**Table 107: Category wise production of livestock and fish fingerlings by KVKs in Zone-XI**

Category	Production of livestock and fish fingerlings		
	Quantity (No.)	Worth (₹)	Farmers (No.)
Fish Fingerlings	238775	1954625	3701
Poultry birds	61828	1633075	12835
Poultry eggs	7261	33806	538
Piglets	272	164600	89
Sheep and goat kids	218	147800	151
Dairy	35	384250	27
<b>Total</b>	<b>308389</b>	<b>4318156</b>	<b>17341</b>



Nursery unit (KVK, Bagalakote)



Nursery unit (KVK, Shivamogga)



Nursery unit (KVK, Ernakulam)



Azolla unit (KVK, Ramanagara)

### 3.1.6 Kisan Mobile Advisory Services (KIMAS)

The KIMAS 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 on real time basis. The details are presented in Table 108. Data shows that 39 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, 8588 text messages were sent to 18.13 lakh farmers. Among these most messaging was related to crops (3691) followed by weather (2440) other enterprises (1051), livestock (927) awareness (335), and marketing (144).

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

A total of 41 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 to the farmers. Details of samples analyzed are presented in Table 109 and data indicated that a total of 30167 samples of soil, water, plant, manure and other received from 25277 farmers belonging to 11906 villages were analyzed. State wise data presented in Table 110 showed that KVKs of Karnataka analyzed 27236 samples whereas 2931 samples were analyzed in Kerala.

In addition to 41 SWTL, 13 KVKs have mobile soil testing kits to meet the growing need of soil testing by farmers and tested 20279 soil samples belonging to 18783 farmers spread across 7680 villages (Table 111). 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 112 and it shows that a total of 27998 soil health cards were distributed among farmers by KVKs of Zone XI. Out of which 14750 soil health cards are through SWTL and 13248 are through mobile soil testing kits.

**Table 108: State wise SMS text messages sent on priority areas to farmers by KVKs in Zone XI**

State	KVKs (No.)	Farmers (No.)	Advisories (No.)						
			Crop	Livestock	Weather	Marketing	Awareness	Other enterprises	Total
Karnataka	30	1636315	916	158	185	134	287	268	1948
Kerala	8	176418	2578	534	2255	10	48	705	6130
Lakshadweep	1	71	197	235	-	-	-	78	510
<b>Total</b>	<b>39</b>	<b>1812804</b>	<b>3691</b>	<b>927</b>	<b>2440</b>	<b>144</b>	<b>335</b>	<b>1051</b>	<b>8588</b>

**Table 109: Samples analyzed by KVKs in Zone XI**

Type of sample	Samples (No.)	Farmers (No.)	Villages (No.)
Soil	20279	16618	7680
Water	8284	7701	3960
Plant	133	44	8
Manure and others	1471	914	258
<b>Total</b>	<b>30167</b>	<b>25277</b>	<b>11906</b>

**Table 110: State wise soil, water, plant analysis carried out by KVKs in Zone XI**

State	Samples (No.)	Farmers (No.)	Villages (No.)
Karnataka	27236	22476	11431
Kerala	2931	2801	475
<b>Total</b>	<b>30167</b>	<b>25277</b>	<b>11906</b>

**Table 111: State wise soil testing by KVKs in Zone-XI using mobile soil testing kits**

State	Samples (No.)	Farmers (No.)	Villages (No.)
Karnataka	17622	16126	7314
Kerala	2657	2654	366
<b>Total</b>	<b>20279</b>	<b>18783</b>	<b>7680</b>

**Table 112: State wise distribution of soil health cards by KVKs in Zone-XI**

State	Distribution of soil health cards		Total
	SWTL	Mobile soil testing kit	
Karnataka	13332	12337	25669
Kerala	1418	911	2329
<b>Total</b>	<b>14750</b>	<b>13248</b>	<b>27998</b>

**(a) World Soil Day Celebration**

World Soil Day was celebrated by 43 KVKs of Zone XI on 5 December, 2020 with the participation of 4620 farmers; 5 VIPs including Hon'ble Ministers, MPs and MLAs; 69 other public representatives; and 287 officials. On the occasion, 2,165 soil health cards were distributed among farmers. A total of 168 news items related to celebration of world soil day were covered by media across the Zone.



World soil day celebration (KVK, Belagavi II)



World soil day celebration (KVK, Shivamogga)

**3.1.8 Rainwater Harvesting Units**

Rainwater harvesting units with micro irrigation system established in 16 KVKs during the previous years were utilized by the KVKs for extending services to farming community. During the period, KVKs conducted 50 training courses and 51 demonstrations as well as produced 332682 planting material utilizing the facility. Further, 21465 farmers and 253 officials visited these units and got acquainted with the rainwater harvesting techniques.

**3.1.9 Convergence and Linkages**

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 the development departments for sharing technology and information through bi-monthly workshops, seminars, technology weeks, frontline demonstrations, field days, farmers-scientists interfaces 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 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 113. Data indicated that KVKs

participated in 845 programmes organized by ATMA and at the same time KVKs organized 413 programmes in collaboration with ATMA.



Capacity development programme on ICM in vegetables in collaboration with ATMA (KVK, Uttara Kannada)

### (b) External funded projects/schemes

External funds received by KVKs to organize various programmes and activities through convergence and linkage is presented in Table 114. A total of ₹. 1092.44 lakh was received by KVKs of Zone XI of which Rs. 782.93 lakh by KVKs of Karnataka and ₹. 309.51 lakh by KVKs of Kerala. In terms of total amount received, support from the state governments and development departments was high in both Karnataka and Kerala. Agencies like Rashtriya Krishi Vikas Yojana (RKVY), National Horticultural Mission (NHM) and National Bank for Agriculture and Rural Development (NABARD) were funded/supported KVK activities. Various Boards and Directorates also supported KVK activities through convergence and linkages for optimum utilization of available resources.

Table 113: Details of linkages with ATMA by KVKs in Zone XI

Programmes	Convergence with ATMA by KVKs					
	Karnataka		Kerala		Total	
	Programmes attended by KVKs (No.)	Programmes organized by KVKs (No.)	Programmes attended by KVKs (No.)	Programmes organized by KVKs (No.)	Programmes attended by KVKs (No.)	Programmes organized by KVKs (No.)
Meetings	99	23	42	26	141	49
Research projects	27	32	2	5	29	37
Training programmes	239	46	87	80	326	126
Demonstrations	124	90	8	21	132	111
Kisan mela	21	12	0	10	21	22
Technology week	6	6	0	1	6	7
Exposure visit	3	8	0	1	3	9
Exhibition	10	0	33	13	43	13
Soil health camps	27	6	4	3	31	9
Animal health campaigns	84	14	3	6	87	20
Video films	1	3	0	0	1	3
Extension literature	0	4	18	0	18	4
Pamphlets	0	1	0	0	0	1
Integrated farm development	3	0	0	0	3	0
Agri-preneurs development	4	2	0	0	4	2
<b>Total</b>	<b>648</b>	<b>247</b>	<b>197</b>	<b>166</b>	<b>845</b>	<b>413</b>

**Table 114: External fund received by KVKs in Zone XI through convergence and linkages**

Name of external funding agency	KVKs (No.)	Amount received (₹.)
<b>Karnataka</b>		
Agricultural Technology Management Agency (ATMA)	3	670000
Coconut Development Board, Bengaluru	1	37500
DBT, GOI	1	3100000
Directorate of Cashewnut and Cocoa Development, Kochi. Kerala	1	1050000
Government of Karnataka	3	43577000
Karnataka Renewable Energy Development Limited, Hubballi	1	100000
M/s BASF India Ltd., Thane	1	119000
MANAGE, Hyderabad	1	800000
National Bank for Agriculture and Rural Development (NABARD)	1	750000
National Horticulture Mission (NHM)	4	1227000
Rashtriya Krishi Vikas Yojana (RKVY)	3	21155800
Shreeji Ag Chem Pvt. Ltd., Vadodara	1	119000
State Agricultural Universities	3	2600000
String Bio Private Limited, Bengaluru	1	133280
Tagros Chemicals India Pvt. Ltd. Chennai	1	200000
UPL Mumbai	1	1864500
Willowood chemicals Pvt. Ltd., Gujarat	1	170000
Willwood chemicals Pvt Ltd, New Delhi	1	620000
<b>Total</b>		<b>78293080</b>
<b>Kerala</b>		
Agricultural Technology Management Agency (ATMA)	2	1684000
Government of Kerala	6	9053300
National Bank for Agriculture and Rural Development (NABARD)	2	4088000
National Horticulture Mission (NHM)	2	4276000
State Planning Board, Kerala	2	11850000
<b>Total</b>		<b>30951300</b>
<b>Grand total</b>		<b>109244380</b>

### 3.1.10 Success Stories and Cases of Large-Scale Adoptions

#### 3.1.10.1 Karnataka

##### (a) Hallisri SHG (KVK, Tumakuru-II)

The Hallisri SHG group at Thovinakere of Koratagere Taluk has established home scale processing and value addition of finger millet under the technical guidance of KVK, Tumakuru-II during 2016-17. KVK had conducted EDP programme on processing, value addition, branding and market linkage in finger millet to the members of SHG. Initially active women self-help groups were identified and a series of training programmes were arranged to give hands-on experience on preparation of finger millet products such as finger millet malt, finger millet mixtures, finger millet laddu and finger millet chakkali, quality control measures, labelling and marketing linkage of the products. Marketing of value added products from finger millet received higher income compared to selling finger millet grains with BCR ranging from 1.55 to 1.66 for different value added products. The SHG could earn profits due to increased demand for these value products. During the reporting year, SHG produced 200 kg malt, 100 kg laddu, 50 kg mixture and 100 kg chakkali and sold with net income of ₹. 38700. Value added products of finger millet were first commercialized by SHG during krishi melas, meetings, training programmes organized by different government organizations and private organizations. Now the members are preparing and supplying to organic shops in Tumakuru as per the orders.



Participation of SHG in organic millet mela held at Tumakuru

##### (b) Value addition of millets led to additional income to Shri Siddanagowda (KVK, Koppal)

Shri Siddanagowda, progressive farmer of Yaradona village of Gangavathi taluk in Koppal district is basically a paddy grower. Yaradina village is the tail end village of Tungabhadra canal water. Tail end farmers of Tungabhadra command areas usually face water problems for the second paddy crop. Shri Siddanagowda opted for cultivating millets which are nutritionally rich and suitable for tough climatic conditions. Supporting his interest, KVK, Koppal introduced foxtail millet varieties SIA-2644 and HN-46, little millet variety DHLM- 36-3 and kodo millet variety RK- 39025 in his field. As a result of high yields, Shri Siddanagowda continued these varieties in subsequent years. Further, he underwent training conducted by KVK on processing of millets. Then he approached State Government of Karnataka and established millet processing unit under programme INSIMP especially for foxtail, little, kodo and brown top millets. Apart from processing and milling millets into rice, rava and flour, he is also preparing value added millet products such as dosa mix, idli mix and malt.

Processing and value addition doubled his income. To encourage millets among tail-end command area farmers, he formed millet grower's groups in which farmers not only cultivating millets and also do the processing and value addition. Now millets cultivators not only increased their income by 20 per cent more than the paddy growers but also their families relishing nutrient rich millets. Recently, Shri Siddanagowda and his group purchased vehicle and started door delivery of millets which not only increased millet business but also made consumers happy. Shri Siddanagowda is buying millets from other farmers and engaged his family members along with 2 to 3 labourers in processing, value addition, packing, transportation and selling of the products. Other farmers of Koppal district are also coming forward for processing of millets seeing the success of Shri Siddanagowda.



A view of barnyard millet crop



A view of foxtail millet crop

**(c) Shri Basavaraj Hulikatti - A medical representative turned as a dairy farmer (KVK, Haveri)**

Shri Basavaraj Hulikatti belonging to Chalageri village in Ranebennuru Taluk of Haveri district is a graduate and was working for a private company as medical representative. Due to less salary and heavy work load, he left the job and chose dairy farming in his own land of 25 guntas. He underwent training on dairy farming sponsored by Government of India for 25 days at KVK, Haveri.

He started dairy farm with eight HF crossbred cows under the technical guidance of KVK. The main problem he faced was scarcity of green fodder due to less land holding and he resolved it by the guidance of KVK through cultivating Hybrid Napier CoNB-5 which yielded around 160 ton/acre/year as well as establishment of hydroponic fodder unit with financial support from animal husbandry department to overcome green fodder scarcity during summer months. He has acquired all the major dairy farm equipment like chaff cutter and milking machine to reduce the drudgery. He fitted small fogger all along roof inside the animal shed to reduce ambient temperature during summer season. Sprinkling of water to animals has reduced the heat stress and increased the production. The herd size has increased to 12 Cows (eight milking cows, four pregnant cows) and five calves. Total milk production per day is around 90 litres and getting ₹. 45000 net income per month. Further, he started his own small scale milk collection centre through which he is collecting milk from different farmers and selling it to milk processing centers. He has engaged one male labour in his farm with 295 man days per annum. Farmers are inspired by him and have found ways for self-employment. He gave fodder slips of CoNB-5 to more than 25 farmers. Three farmers started their own small scale dairy farm in nearby villages after visiting his dairy farm.



A view of dairy farm of Shri Basavaraj Hulikatti



Water fogger at the roof of dairy unit



Hydroponic fodder unit

**(d) Direct marketing during Covid Lockdown became successful enterprise (KVK, Chikkaballapura)**

India is witnessing a transformation wherein qualified youngsters are leaving well paid jobs and started farming in rural areas by adopting improved technologies. This is what happened with 29 years old Shri Prashant Reddy S/o Ramesh Reddy who hails from Batlahalli village in Chintamani taluk of Chikkaballapura district.

After pursuing M. Tech (Computer Science and Engineering) he joined a private firm at Bangalore and was getting good salary. Looking into the increasing demand for the organic fruits and vegetables in Bangalore, he decided to quit his job and started organic farming in his native village during 2019-20. He participated in the training programme on biofertilizers production organized by KVK, Chikkaballapur. This training served as push factor and with the guidance of KVK Scientists, he was successful in getting a good yield. But due to outbreak of COVID 19, he was unable to market his produce. He lost hopes and was in critical situation since it was the only source of income. After discussion with KVK Scientists, he was able to develop simple software for marketing of the produce and decided to sell organically grown produce in apartments in Bangalore. Software link was shared in different ICT platforms like whatsapp, facebook, instagram, mails etc, to create awareness about it. By clicking on the link, customers were able to get the information like importance of organic products, organic fruits and vegetables available, their price and approximate date of delivery. Based on the customer order he used to supply the organic fruits and vegetables. KVK, Chintamani also provided the marketing linkages like Big Basket, Ninjacart, Spudnic farms, wholesale dealers and organic farmers associations to sell his produce.

As a result he was able to sell four tons of carrot, one tons of capsicum, four tons of beetroot, 15 tons of grapes, one ton of papaya, half ton of tomato, three tons of onion while other farmers left their fields un harvested. Further, because of direct selling to consumers, he realized good returns for his produce in pandemic situation with 70 per cent price increase in onion followed by beetroot (66.66%), grapes (63.63%), tomato (60.00%), capsicum (56.25%), carrot (52.83%), and papaya (50.00%). This was win to win situation where farmer got the better price for their produce on one side and on other side consumers got the good quality fruits and vegetables at their door steps without moving out of their homes during the COVID situation.

Initially Shri Prashant cultivated only carrot and beetroot. After realizing the benefits of direct selling to consumers, he has adopted staggered sowing of all vegetables to meet the demands on regular basis. Presently he is growing beetroot, carrot, tomato, green leafy vegetables, papaya, guava, custard apple, pigeonpea, sweet corn, cabbage, minor millets etc. With the aim of integrated farming, he has started animal husbandry, poultry, bee keeping and rearing fish in farm pond.



Crop field



KVK Scientists visit to field



Packing of vegetables and fruits



Mobile market

**(e) IFS - Enhanced income of Shri Durgappa Angadi (KVK, Shivamogga)**

Shri Durgappa Angadi is an enthusiastic progressive and innovative farmer from Sahasravalli village in Shikaripura taluk of Shivamogga district. He owns 1.95 ha of land cultivating different crops viz., coccinia, maize, arecanut, rearing cattle and producing vermicompost. He attended a training organized by KVK during 2015 on Integrated Farming System. Under the KVK technical guidance, he started growing different intercrops in younger arecanut garden viz., banana, fodder crops and vegetable crops like drumstick, yard long bean, cluster bean, chilli and bitter gourd as main crops. He planted different forest species like teak, silver oak and meliadubia as border crops. He is producing and using the organic manures to enrich the soil fertility, the bio-pesticides and botanicals for management of pest and diseases in different crops. He further added subsidiary enterprises like bee keeping,

By practicing IFS technology, he harvested the bumper yield in banana, vegetable crops and getting additional income from subsidiary enterprises. His farm became as resource unit for KVK training programmes on IFS and organic farming.

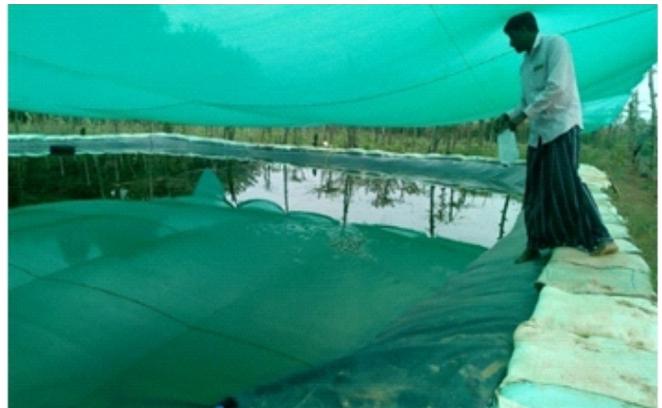
At present he is earning net profit of 7.16 lakh, earlier it was 4.04 lakh. His main income is from Coccinia (₹. 190000) followed by Arecanut (₹. 160000), Inter crop in younger arecanut with banana (₹. 136000), Yard long bean (₹. 65000), Ginger (₹. 60000), Cattles (₹. 33000), Maize (₹. 25000), Honey bee colonies (₹. 16000), Poultry (₹. 11000), Fishery (₹. 10000), and Vermicompost (₹. 10000). He disseminated the technologies and ICM practices to his neighbouring farmers and surrounding villages through which 1520 farmers are benefited.



Banana intercropping in younger areca garden and bee colonies



Backyard Poultry



Fish rearing in farm pond



Fodder crop (CoFS-29) and banana as intercrops in younger areca garden



Chilli, turmeric and ginger intercropping in younger areca garden

## (f) Value addition in fig made successful during COVID-19 (KVK, Ballari)

A simple but an effective intervention by KVK, Ballari to convert the COVID manifested glut of fig to its value added product helped farm women of Ballari to script a defining success story that has attracted the attention of many .

Fig is among the major crops grown in Ballari district. 'Ballari red', a locally grown fig variety has high demand because of its good quality, sweetness and color compared to other varieties and is produced throughout the year. Ballari red covers 1800 hectares of farming land in the district. Chennai and Bengaluru are two major markets for Ballari figs. The crisis of COVID-19 lockdown led to a break in supply chain for raw figs as Chennai and Bengaluru witnessed a surge in COVID-19 cases. There was a sudden drop in demand as transport of agricultural produce came to a standstill. As fig has a very short shelf life, it was left un-harvested on the fields as farmers thought that it would burden them further with additional labour cost for picking of fruits. Small holder fig farmers are the most affected among all.

KVK, Ballari has responded quickly to this unprecedented situation on a war footing manner. The proven technology developed by Department of Processing and Food Engineering from UAS, Raichur which was refined to suit the local need was disseminated to the farm women of Shrinivas camp of Kurugodu taluk in Ballari district where the figs are grown extensively. Further, KVK efforts on conducting on line capacity development programme, online advisories followed by field visits and demonstrations to the farm women amid COVID-19 situations led fruitful results. Self Help Group (SHG) leaders Mrs.Sudha and Mrs. Poojalearn from the UAS, Raichur recommended post harvest technology for figs. Quality and tasty fig bar and fig rolls were the outcome of the technology disseminated by KVK. Once the art of making fig bars and rolls was mastered, the samples were sent to Pesticide Residue and Food Quality Analysis Laboratory (PRFQAL), UAS, Raichur for testing its quality parameters. FSSAI licences were got upon meeting the required quality parameters. Branding and labelling were done to gain bigger market share. As unlock of restrictions of COVID-19 lockdown started, solar tunnel dryers and tray dryers were setup to increase the productivity and hygiene in the existing process. One solar tunnel dryer can dry 300 kgs of pulp which yields 100 kg of fig rolls each day, which is three times the outcome that was got earlier by sun drying process practiced during lockdown. A group of youngsters have

installed 14 solar tunnel dryers and other required machinery to increase the productivity and meet the market demand of fig rolls. With the market intelligence that they have gained, they are planning to produce 15-20 quintals of fig rolls each day by employing 60 women labours.

Under Prime Minister's Formalisation of Micro Enterprises (PM FME)-'One District One Product' (ODOP) scheme, fig is identified as potential crop for Ballari district. KVK, Ballari arranged a platform for an interaction with the expert advisors of PM FME scheme with these farm women to provide all possible support in the right direction. NABARD is also extending its helping hand to put up a rural mart at Ballari city for expanding their market. Recently NABARD has sent these women to participate in 'Grameena Habba' held at Mantri mall in Bengaluru between, 22-26 February, 2021.

KVK facilitated a link between these farmers and Department of Horticulture, Ballari. Now, progressive farmers have installed Solar Tunnel Dryers with the help of Horticulture department for making the value added products. Director of Horticulture department, Karnataka and District Collector of Ballari, CEO of Zilla Panchayat, Joint Director of Small Scale industries have made visits to these value addition units and have given the hope to expand their activities.



Training on fig value addition by KVK, Ballari



Grading and cleaning of fig fruits



A view of fig value added products



A view of label of fig bar of an enterprise

**(g) Dsb - 21 - a new Soybean variety made a difference in soybean production (KVK, Belagavi-II)**

Bailhongal taluk of Belagavi district known for the production of soybean. Majority of the farmers are cultivating JS-335 variety of soybean which is prone to pod shattering and susceptible to rust. Realizing the gravity of the problem, KVK, Belagavi-II has demonstrated new variety Dsb-21 which is resistant to rust and tolerant to pod shattering at Chikkabagewadi, Mattikopp, Sampagaon and Deshanur villages of Bailhongal taluk by involving 160 farmers covering of 67.40 ha along with participatory seed production. KVK imparted training to the farmers on seed treatment with bio-fertilizers, agronomic practices like weed and water management, nutrient management through foliar application macro and micro nutrients, environment friendly and cost effective plant protection measures. Year-wise area expansion of soybean variety Dsb-21 in Belagavi is presented in Fig. 1. Area expansion of 650 ha with Dsb-21 resulted in production of 13000 q and increase in productivity from 15-20 q/ha. The total additional returns gained is ₹1.20 crore due to varietal replacement.

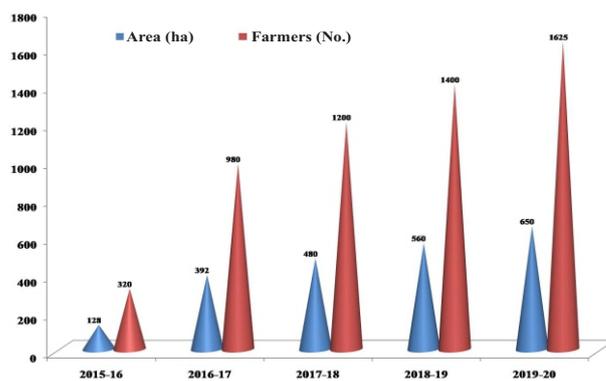


Fig.1 : Year wise area expansion of soyabean variety DSB-21 in Belagavi district



A view of field performance of soybean variety Dsb-21



**(i) Indian broad bean as a relay crop in bitter gourd with staking (KVK, Raichur)**

Shri Basavaraj S/o Sharanappa, age 31 years with B.Tech belonging to Palakamdoddi village in Kotlatkur post in Raichur taluk and district used to cultivate bitter gourd in his field. But gets low income due to solo cropping, water scarcity, more pest and disease incidence due to lateral spreading. To overcome these problems, he adopted staking techniques in bitter gourd with relay cropping of Indian broad bean under the

technical guidance of KVK, Raichur. First he cultivated bitter gourd followed by Indian broad bean using staking and adopting drip irrigation through solar system. Bitter gourd seeds are sown in double row system to save input cost of drip lines. Locally available wooden poles are staked in criss-cross manner for longer durability and also harvesting of fruit to the interior of vines also easy. Indian broad bean is sown later as relay crop for higher and sustainable income. This practice gave advantages like pest and disease incidence was low due to maintenance of hygiene and effective spread of pesticide, 75 per cent reduction on input cost for the second crop, 90 percent water saving, 50 per cent reduction in cost of drip pipe line, 75 per cent reduction in the cost of land preparation and other cultural practices and 20 per cent reduction in spraying of chemicals. Fellow farmers are happy with the result and 10-12 farmers adopted this practice in their fields.



Bitter gourd crop in staking system



KVK scientist visit to bitter gourd crop in staking system



Indian broad bean as a relay crop in bitter gourd in staking system



### 3.1.10.2 Kerala

#### (a) Castor oil based bio repellent - Ecodon against wild boars (KVK, Thiruvananthapuram)

Wild boar menace in Thiruvanthapuram district was mainly found in Kattakada, Vamanapuram, Pulimath, Nedumangad, Kazhakkottam, Aryancode and almost all the hilly areas. Main crops are banana, tubers, coconut and vegetables. Crops are eaten and destroyed by trampling and uprooting by wild boars. Cassava plantations are damaged by wild boars using their tusks to plow and destroy the crop. They attack crops in the early morning and late evening. Attacks are less during the day. Human injury and deaths due to wild boar attacks have also been reported from these areas. However, these are protected species under Schedule 3 of the Wildlife Conservation Act, 1972.

Keeping the above in view, KVK, Thiruvananthapuram carried out frontline demonstrations on castor oil based bio repellent in 10 ha by involving 10 farmers belonging to Panavoor and Anad panchayaths of Nedumangad block during 2014-15 and 2015-16 besides capacity development and method demonstrations in collaboration with ATMA and panchayat Krishi Bhavans. Technology promoted was jute threads impregnated with castor oil based bio repellent- Ecodon [Ecodon :Water (1:2)] around the cropped area at a height of one feet in two tiers which was very effective against wild boar and crop loss was reduced up to 25 per cent with a BC ratio of 1:85. Farmers were satisfied and well accepted as the technology proved to be cost effective, eco-friendly and effectiveness up to three months. For getting good results the method should be done in continuous area and ecodon impregnated jute threads must be continuously tied around the cropped area without any gap. KVK facilitating to procure the



Tying of jute threads impregnated with castor oil based bio repellent- Ecodon



A view of participants in training



bio repellent from the producing company and provide to farmers. In collaboration with Agricultural Technology Management Agency (ATMA), the technology was spread to 175 ha area of Thiruvanthapuram district mainly in Vembayam, Nedumangad, Kilimanoor, Vamanapuram, Nellanad and Kazhakootam Panchayaths.



Mass media coverage

**(b) Farmer participatory pearl spot seed production and supply (KVK, Ernakulam)**

*Etroplus suratensis* is an indigenous fish endemic to east and south-west coasts of peninsular India and Sri Lanka and is popularly known as Pearl spot in Kerala. Pearl spot is also treated as the most popular and premium variety fish in Kerala southern coastal state of India. The government of Kerala declared Pearl spot as “State Fish of Kerala” and celebrated the year 2010-2011 as “The Year of *Pearl spot*” for creating awareness on Pearl spot conservation and its commercial production potential in the state. Pearl spot is heterosexual, monogamous, gonochoristic and perform external

fertilization. Higher consumer demand, price and less availability of Pearl spot directed many of the brackish water fish farmers to commence Pearl spot farming extensively in brackish water ponds and cages using the wild caught fish seeds. The seeds required for Pearl spot fish farming are collected by the inland fisher folk by illegal and unscientific ways. Continuous seed collection from the wild slowly reduced the standing stock of Pearl spot in natural water bodies. Apart from this activity, wetland reclamation, unscientific sand mining, indiscriminate dredging for sub soil lime shell deposits, unscientific fishing practices, pollution, etc., also paved way to destroy the natural breeding ground of Pearl spot and there by reduced Pearl spots natural availability in backwaters.

Even though Pearl spot possess high price and market demand, the main issue faced by the Pearl spot farmers is the lack of availability of good quality seeds. Massive seed production is the only viable way to meet the ever-increasing demand for Pearl spot seed in India. Even though several attempts have been done by different institutes, hitherto no commercial success was noticed in the massive seed production under hatchery-based method. Main issues reported for seed production in hatchery-based methods are low fecundity rate (780 to 3000), less response to induced breeding method, lengthy larvae rearing period (90 to 120 days) and high cost of production. In this context a farmer participatory seed production has been initiated and attained large-scale seed production of Pearl spot utilizing brackish water ponds by KVK, Ernakulum. In these efforts, KVK trained and equipped the farmers to do Pearl spot seed production in BW ponds. The programme covered pond preparation, brood stock selection, breeding, feeding, seed collection, packing and transportation and marketing. Pearl spot seed production technology transfer and technical backstopping from pond selection till harvesting was done by KVK, Ernakulum. Annual net income from single (50 cent) seed production unit is two lakh rupees. KVK supplied ₹. 1.75 lakh seeds of worth 17.5 lakh produced by eight farmers during 2020-21 period. Thereafter, KVK made buy-back arrangement from the successful farmers and supplied through KVK farm store. Seeing the technical viability of the programme 12 more farmers came forward and commenced the programme in Karumalloor Panchayath area alone. Unemployed youth are attracted with the programme as it provides ensured income from unit area.



Pearl spot seed production unit of Mr. Ullas A.R, Karumalloor, Ernakulam



Pearl spot seed packed for supply



Pearl spot seed supply at KVK farm store, CMFRI

### (c) Yard long bean with raised bed and plastic mulching (KVK, Pathanamthitta)

Yard long bean (*Vigna unguiculatas sp sesquipedalis*) is one of the most important commercial vegetable crops of Pathanamthitta district. Even though varieties like Geethika with production potential of 27 t/ha is used for cultivation, yield realized by farmers is less than 12 t/ha due to heavy weed competition, moisture and nutrient stress, incidence of pest and diseases and very high cost of labour. Majority of the farmers in Perumpetty village situated in mallappally thaluk of Pathanamthitta district depend on vegetable cultivation for living. Due to yearly floods during the monsoon, cultivation is mainly done during the rabi and summer seasons. To address this, KVK, Pathanamthitta carried out frontline demonstration on yard long bean cultivation with raised bed and plastic mulching with water soluble fertilisers using newly released KAU variety Geethika in the field of Sri P.T Purushothaman Nair, Anu Bhavan Perumpetty who is a progressive farmer and regularly cultivate vegetables during 2016-17. Raised beds of 30 cm height and 90 cm width are made and after application of FYM @ 20 t/ha and liming materials as per soil test data was covered with silver-black plastic mulching sheet. Water soluble fertilisers were given along with raised bed furrow irrigation @ 20:30:10 kg/ha.

Further, KVK provided technical backup and guidance for him along with other farmers of the Perum petty on various operations like preparation of raised beds, laying of silver-black plastic mulching sheet, preparation of planting holes at 45 cm spacing and seeding. All farmers kept a close watch on the daily progress of the demonstration. Many were having apprehensions regarding the possibility for the success of the crop.

Before the start of the intervention base data was collected through interview of farmers of the Haritha Farmers Club Perum petty besides secondary data obtained from Agricultural Office, Kottanad. During 2015-16, the Village Perum petty had 228 Yard long bean farmers with average holding size of 0.12 ha per farmer. The area under yard long bean was 16.70 ha with estimated production of 193.72 t. The Income realized by farmers during the period was ₹. 112542 /ha and the estimated BCR was 1.48. By the year 2019-20, farmers were convinced about the potential, prolonged life and harvest of the crop obtained and the area under yard long bean has increased to 28.40 ha. The total estimated production was 528.24 t and the productivity was 28.30 t/ha. During this period the average net income realized by farmers was ₹. 478126/ha with BCR: 2.72. Further, the use of plastic mulching drastically reduced the

frequency of irrigation (90 irrigations in no-mulch situations and only 30 irrigations under plastic mulching), the labour cost and energy expense associated with it. Adoption of the technology resulted in enhancement of net income of the farmer (with 0.12 ha yard long bean cultivation) from ₹. 13505 to ₹. 57375 (324% increase).



A view of Yard long bean variety Geethika with plastic mulching

### (d) Indoor plants gave sustainable livelihood for a family (KVK, Kollam)

Life is colourful and sweet for the couples Shri. K.M. Radhakrishnan Unnithan (49) and Smt. Smitha Radhakrishnan (40) hailing from Vettikavala of Kollam district. Shri. Radha Krishnan started his farming activities at the age of 13 to support his father. They used to cultivate vegetables and engaged in apiculture for several years. He attended several apiculture trainings and started his career in beekeeping and later become a national level trainer. After his marriage, wife Smt. Smitha started supporting him in all farm activities as she could not settle in a regular job even though with a commerce graduation. Then she searched for a career in farm science to support her family. She attended several training programs of KVK, Kollam. With the launch of Agricultural Skill Council of India (ASCI) for imparting basic skills to the aspirants, a training program on Gardener's training was conducted by KVK in the year 2018 and Smt. Smitha was one among the trainees. Gardeners training course triggered her to explore the scope of ornamental nursery for income generation by supplying ornamental plants and its seedlings and she established an Agri-venture named KMR Agro organic farm and nursery under the technical guidance of KVK Scientists. She started collection and propagation of novel and rare varieties of ornamental plants and other crops for sale. Vast collection of ornamental and medicinal plants attracted many visitors, scholars and traders. Further, she established a shade net house with the support of state horticulture mission and Vettikaval

Krishi Bhavan in 2020. Her average monthly sale was 2.50 lakh from 1.5 acre of land during 2020-2021.

Smt. Smitha is now active in conducting specialised trainings to rural youth, women and farmers in ornamental gardening. More than 25 small-scale nurseries were started under the training and guidance of Smt. Smitha.



Collection of Adenium varieties



A view of ornamental shade net house

### 3.1.11 Recognition and Awards

- ICAR-KVK, Bagalakote received the Zonal Best KVK award "Pandit Deen Dayal Upadhyay Krishi Vigyan Rashtriya Protshahan Puraskar 2019 for Zone XI.
- Shri. S.C. Thimmaiah, an innovative farmer from Nallur village of Kodagu district in Karnataka and Shri. T. Purushothaman, an innovative farmer from Kerala guided by KVKs in Zone XI were awarded with ICAR Jagjivan Ram Abhinav Kisan Puraskar 2019.

## 3.2 Special Programmes

### 3.2.1 Cluster Frontline Demonstrations (CFLDs) on pulses under NFSM

During the reporting year, ICAR-ATARI, Bengaluru has implemented the project on Cluster Frontline Demonstrations (CFLDs) on Pulses under NFSM with financial support from Department of Agriculture, Co-operation & Farmers Welfare (DAC & FW) through ICAR, New Delhi with an aim to enhance the production of pulses in the country in general and in Zone-XI in particular and details are presented in Table-115. Data indicates that 2350 CFLDs on different pulse crops were conducted by KVKs of Zone-XI in 940 ha.

During kharif, 850 demonstrations were conducted by KVKs of Karnataka in 340 ha which includes 240 ha on pigeonpea covering 600 farmers, 60 ha on greengram covering 150 farmers and 40 ha on blackgram covering 100 farmers.

During rabi, 710 demonstrations were conducted in 284 ha of which KVKs of Karnataka conducted 685 demonstrations in 274 ha that covers 254 ha on chickpea by involving 635 farmers, 20 ha on greengram by involving 50 farmers and KVKs of Kerala conducted 25 demonstrations on blackgram in 10 ha.

During summer, 790 demonstrations were conducted in 316 ha of which KVKs of Karnataka conducted 340 demonstrations in 136 ha that covers 50 ha on greengram by involving 125 farmers, 66 ha on blackgram by involving 165 farmers, 20 ha on cowpea by involving 50 farmers and KVKs of Kerala conducted 450 demonstrations in 180 ha that covers 80 ha on greengram by involving 200 farmers, 70 ha on blackgram by involving 175 farmers and 30 ha on cowpea by involving 75 farmers.



Pigeonpea (KVK, Haveri)

**Table115: CFLDs on pulses under NFSM conducted by KVKs of Zone XI**

Season	State	Crop	CFLDs on pulses	
			Area (ha)	Demonstrations (No.)
(a) Kharif	Karnataka	Pigeonpea	240	600
	Karnataka	Greengram	60	150
	Karnataka	Blackgram	40	100
	<b>Total</b>		<b>340</b>	<b>850</b>
(b) Rabi	Karnataka	Chickpea	254	635
	Karnataka	Greengram	20	50
	Kerala	Blackgram	10	25
	<b>Total</b>		<b>284</b>	<b>710</b>
(c) Summer	Karnataka	Greengram	150	125
	Kerala	Greengram	80	200
	Karnataka	Blackgram	66	165
	Kerala	Blackgram	70	175
	Karnataka	Cowpea	20	50
	Kerala	Cowpea	30	75
<b>Total</b>			<b>316</b>	<b>790</b>
<b>Grand total (a + b + c)</b>			<b>940</b>	<b>2350</b>



Chickpea (KVK, Gadag)



Pigeonpea (KVK, Chikkaballapura)



Greengram (Belagavi-II)



Blackgram (KVK, Bidar)



Chickpea (KVK, Raichur)

**3.2.2 Cluster Frontline Demonstrations (CFLDs) on Oilseeds under NFSM (NMOOP)**

During the reporting year, ICAR-ATARI, Bengaluru has implemented the project on Cluster Frontline Demonstrations (CFLDs) on Oilseeds under NFSM (NMOOP) with financial support from

Department of Agriculture, Co-operation & Farmers Welfare (DAC & FW) through ICAR, New Delhi with an aim to enhance the production of oilseeds in the country in general and in Zone XI in particular and details are presented in Table-116. Data indicates that 1950 CFLDs on different oilseed crops were conducted by KVKs of Zone-XI in 780 ha. During kharif, 350 demonstrations were conducted by KVKs of Karnataka in 140 ha which includes 50 ha on groundnut by involving 125 farmers, 30 ha on soybean by involving 75 farmers, 10 ha on sunflower by involving 25 farmers, 20 ha on sesame by involving 50 farmers, 10 ha on niger by involving 25 farmers and 20 ha on castor by involving 50 farmers.

During rabi, 575 demonstrations were conducted by KVKs of Karnataka in 230 ha which includes 70 ha on groundnut by involving 175 farmers, 80 ha on sunflower by involving 200 farmers, 40 ha on linseed by involving 100 farmers, 20 ha on safflower by involving 50 farmers and 20 ha on mustard by involving 50 farmers whereas KVKs of Kerala conducted demonstrations on sesame in 20 ha by involving 50 farmers.

During summer, 975 demonstrations were conducted in 390 ha of which KVKs of Karnataka conducted 900 demonstrations in 360 ha that covers 270 ha on groundnut by involving 675 farmers, 70 ha on soybean by involving 175 farmers, 20 ha on sesame by involving 50 farmers and KVKs of Kerala conducted 75 demonstrations in 30 ha that covers 20 ha on groundnut by involving 50 farmers and 10 ha on sesame by involving 25 farmers.



Sunflower (KVK, Bidar)

**Table-116: CFLDs on oilseeds under NFSM (NMOOP) conducted by KVKs of Zone XI**

Season	State	Crop	CFLDs on oilseeds	
			Area (ha)	Demonstrations (No.)
(a) Kharif	Karnataka	Groundnut	50	125
	Karnataka	Soybean	30	75
	Karnataka	Sunflower	10	25
	Karnataka	Sesame	20	50
	Karnataka	Niger	10	25
	Karnataka	Castor	20	50
	<b>Total</b>		<b>140</b>	<b>350</b>
(b) Rabi	Karnataka	Groundnut	70	175
	Karnataka	Sunflower	80	200
	Karnataka	Sesame	20	50
	Karnataka	Linseed	40	100
	Karnataka	Safflower	20	50
	Karnataka	Mustard	20	50
	<b>Total</b>		<b>250</b>	<b>625</b>
(c) Summer	Karnataka	Groundnut	270	675
	Kerala	Groundnut	20	50
	Karnataka	Soybean	70	175
	Karnataka	Sesame	20	50
	Kerala	Sesame	10	25
<b>Total</b>			<b>390</b>	<b>975</b>
<b>Grand total (a + b + c)</b>			<b>780</b>	<b>1950</b>



Groundnut (KVK, Ballari)



Soybean (KVK, Belagavi-I)



Sunflower (KVK, Haveri)



Linseed (KVK, Bidar)



Safflower (KVK, Kalaburagi-II)



Sesame (KVK, Alappuzha)

### 3.2.3 Seed hubs

Timely availability of adequate quantity of quality seed is one of the most critical factors to enhance productivity of pulses. In this direction the Department of Agriculture, Cooperation & Farmers Welfare (DAC & FW), Government of India, New Delhi has sanctioned a project on 'Creation of Seed Hubs for Increasing Indigenous Production of Pulses in India' under National Food Security Mission (NFSM) with ICAR-Indian Institute of Pulses Research (ICAR-IIPR), Kanpur as Nodal Agency for its implementation at 150 Seed Hub centres across the country through State Agricultural Universities/Krishi Vigyan Kendras/ICAR Institutes.

As a part of it, eight KVKs viz., Bagalakote, Bidar, Belagavi-II, Dharwad, Kalaburagi-II, Mysuru, Vijayapura-I and Mandya established Seed Hubs under ICAR-ATARI, Bengaluru and started functioning from 2016-17. Crop wise seed production on different pulse crops carried out by Seed Hubs during reporting year is presented in Table-117. Data indicates that 3047.25 q pulse seed were produced by Seed Hub KVKs which includes 1646.00 q seed of chickpea, 735.70 q seed of pigeonpea, 621.90 q seed of blackgram, 26.55 q seed of greengram, 13.80 q seed of cowpea and 3.30 q seed of horsegram.



Seed production of greengram under Seed Hub (KVK, Mandya)



Seed production of chickpea under Seed Hub (KVK, Belagavi-II)

**Table 117: Seed production of pulses through Seed Hubs under NFSM by KVKs of Zone XI**

Crop	Varieties	Seed quantity (q)
Chickpea	JG-11, JAKI-9218, NBeG-49 and NEeG-3	1646.00
Pigeonpea	TS-3-R, GRG 811 and BRG-3	735.70
Blackgram	LBG-791	621.90
Greengram	DGGV-2 and KKM-3	26.55
Cowpea	KBC-9	13.80
Horsegram	PHG-9	3.30
<b>Total</b>		<b>3047.25</b>

### 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. In ATARI, Bengaluru (Zone XI), technology demonstration component was implemented in seven most vulnerable districts, namely Belagavi (drought/heat), Davanagere (drought/heat), Chikkaballapura (drought/heat), Tumakuru (drought), Gadag (drought/heat) and Kalaburagi (drought/heat) in Karnataka and Alappuzha (water inundation/drainage) in Kerala. Rainfall situation and technological interventions undertaken in this project are briefed here under.

#### (a) Rainfall distribution

Scenario of rainfall in NICRA KVK districts of Zone XI for the year 2020 is presented in Table 118. Data indicated that annual rainfall recorded was highest in Alappuzha district of Kerala with 2466.10 mm; with distribution of 495.70, 360.60, 346.10 and 590.40 mm in the months of June, July, August and September, respectively. Seven intensive rain spells of more than 60 mm occurred during the months from June to September. Annual rainfall in Belagavi district recorded 828.60 mm with even distribution ranging from 117.50 to 192.70 mm per month during the crop season with one dry spell of more than 10 days in the month of August. In Chikkaballapur, one dry spell of more than 15 days in June and two dry spells of more than 10 days in July and August with annual rainfall of 1040.00 mm was recorded from June to September months. Davanagere

district received annual rainfall of 546.80 mm with distribution of 39.40, 137.70, 45.40 and 147.80 mm, was 828.60 respectively from June to September months. There was one dry spell of more than 20 days in June and another dry spell of more than 10 days in July month. Gadag district received annual rainfall of 636.70 mm with even distribution during the crop season without any dry spells. In Hirehalli of Tumakuru district of Karnataka, annual rainfall recorded was 952.00 mm with two dry spells of more than 10 days in the month of June and September. Kalaburagi district received 1316.00 mm rainfall during 2020 with good distribution throughout the crop season.

#### (b) Summary of interventions

The NICRA is being implemented based on four modules such as (i) natural resources management, (ii) crop production, (iii) livestock and fisheries and (iv) institutional interventions including capacity development and extension activities. Summary of interventions in each module carried out by KVKs under NICRA are presented in Table 119.

#### (c) Module wise interventions

Module wise technological interventions implemented in the NICRA cluster villages are discussed here under:

##### *Module I: Natural Resources Management*

Under the module, interventions related to resource conservation technologies such as aquatic weeds composting using EM culture, moisture conservation through trench cum bunding, tank silt application and green manuring, dryland horticultural crops planting and soil health card for better nutrient management were

implemented. In order to improve water storage capacity, water storage structures such as farm ponds and check dams were desilted and strengthened. A total of 1122 demonstrations were implemented on NRM

activities covering 1150.28 ha area in order to build climate resilience in cluster of villages covering seven drought prone districts and details are presented in Table 120.

**Table 118: Scenario of rainfall in NICRA KVK districts in Zone XI for the year 2020**

KVK	Month	Kharif 2020 Rainfall received (mm)	Dry spells during kharif season 2020 (No.)			Intensive rain spells (2020) (No.)	
			>10 days	>15 days	>20 days	>60 mm per day	Water logging observed (Days)
Alappuzha	June	495.70	0	0	0	1	0
	July	360.60	0	0	0	2	0
	August	346.10	0	0	0	2	0
	September	590.40	0	0	0	2	0
	Annual	2466.10					
Belagavi-I	June	168.60	0	0	0	0	0
	July	192.70	0	0	0	1	0
	August	118.40	1	0	0	0	0
	September	117.50	0	0	0	0	0
	Annual	828.60					
Chikkaballapura	June	106.00	0	1	0	0	0
	July	179.00	1	0	0	1	0
	August	141.00	1	0	0	1	0
	September	126.00	0	0	0	0	0
	Annual	1040.00					
Davanagere	June	39.40	0	0	1	0	0
	July	137.70	1	0	0	0	0
	August	45.40	0	0	0	0	0
	September	147.80	0	0	0	1	0
	Annual	546.80					
Gadag	June	64.50	0	0	0	0	0
	July	109.40	0	0	0	0	0
	August	81.90	0	0	0	0	0
	September	165.80	0	0	0	0	0
	Annual	636.70					
Kalaburagi-I	June	258.90	0	0	0	1	0
	July	363.20	0	0	0	1	0
	August	164.20	0	0	0	0	0
	September	242.20	0	0	0	1	0
	October	227.00	0	0	0	2	30
	Annual	1316.00					
Tumakuru-II	June	99.00	1	0	0	0	0
	July	158.00	0	0	0	0	0
	August	155.00	0	0	0	0	0
	September	214.00	0	1	0	0	0
	Annual	952.00					

**Table 119: Summary of interventions in each module carried out by KVKs under NICRA**

KVK	Modules under NICRA									
	NRM		Crop production		Livestock & Fisheries		Capacity building		Extension activities	
	Demos (No)	Area (ha)	Demos (No)	Area (ha)	Demos (No)	Animals (No)	Trainings (No)	Farmers (No)	Programs (No)	Farmers (No)
<b>(a) Kerala</b>										
Alappuzha	110	120.00	69	11.50	43	275	8	100	7	60
<b>(b) Karnataka</b>										
Belagavi-I	164	133.28	424	133.23	130	366	10	360	100	497
Davanagere	70	45.00	184	73.40	202	100	21	658	19	644
Chikkaballapura	94	117.00	183	87.00	240	850	10	140	8	174
Gadag	16	39.00	255	105.00	26	26	13	333	50	543
Kalaburagi-I	4	16.00	53	43.00	39	124	4	61	4	140
Tumakuru-II	664	680.00	321	108.00	118	136	2	80	3	61
<b>Total</b>	<b>1012</b>	<b>1030.28</b>	<b>1420</b>	<b>549.63</b>	<b>755</b>	<b>1602</b>	<b>60</b>	<b>1632</b>	<b>184</b>	<b>2059</b>
<b>Grand total (a + b)</b>	<b>1122</b>	<b>1150.28</b>	<b>1489</b>	<b>561.13</b>	<b>798</b>	<b>1877</b>	<b>68</b>	<b>1732</b>	<b>191</b>	<b>2119</b>

**Table 120: NRM interventions undertaken in NICRA villages**

KVK	Technology/Intervention	Demos (No.)	Area(ha)
<b>(a) Kerala</b>			
Alappuzha	Large scale composting of aquatic weeds using EM solution and use for vegetable cultivation in grow bags	10	20.00
	Soil health cards	100	100.00
	Kerala total	110	120.00
<b>(b) Karnataka</b>			
Belagavi-I	Drip irrigation	5	5.00
	Soil health cards issued and how they are used	70	70.00
	Green manuring	41	41.00
	Composting	16	16.00
	Crop diversification-guava, mango, curry leaf	27	1.28
	Total	164	133.28
Chikkaballapura	Desilting of village tank	1	50.00
	Trench cum bund	10	10.00
	Check dams	30	30.00
	Farm ponds	10	10.00
	Community ponds	3	3.00
	Dry land horticulture crops-cashew, tamarind	40	14.00
	Total	94	117.00
Davanagere	Bore well recharge	50	25.00
	Soil health cards issued and how they are used	20	20.00
	Total	70	45.00
Gadag	Desilting work	1	30.00
	Borewell recharging unit	5	5.00
	Crop diversification -mixed dryland horticulture (mango, cashewnut, tamarind, drumstick and curry leaf)	10	4.00
	Total	16	39.00
Kalaburagi-I	Trench cum bund	2	8.00
	Check dam desilting	2	8.00
	Total	4	16.00
Tumakuru-II	Trench cum bunding	253	253.00
	Levelling	62	62.00
	Tank silt application	123	123.00
	Farm ponds	87	97.00
	Check dams	5	11.00
	Dryland horticulture -tamarind, amala, cashew	134	134.00
	Total	664	680.00
	<b>Karnataka total</b>	<b>1012</b>	<b>1030.28</b>
	<b>Grand total (a + b)</b>	<b>1122</b>	<b>1150.28</b>



Module-I :Desilted structure and filled with rain water (KVK, Gadag)

### **Module II: Crop production**

This module consisting of crop production interventions such as introduction of drought/high temperature tolerant varieties, short duration varieties, high yielding varieties, drought management measures, location specific intercropping systems with high sustainable yield index, contingent crops, eco-friendly management practices, water saving cultivation methods (aerobic, micro irrigation) and crop diversification were implemented. A total of 1489 demonstrations covering 563.13 ha area spread over seven NICRA districts were implemented and district and technology-wise details are presented in Table 121.

#### **(a) Climate resilient varieties**

The climate resilient varieties emerged under NICRA demonstrations such as blackgram (DBGV-5), finger millet (ML-365), foxtail millet (DHFt-109-3), perennial fodder crop (CoFS-29 &31) and pigeonpea (TS-3R, BRG-1&2 and BRG-5) suiting these drought prone districts have been incorporated in *Kharif-2020* in the district plans of NICRA districts. A total of 263351.40 ha has been brought under climate resilient varieties through state department of agriculture in Belagavi, Chikkaballapura, Davanagere, Gadag, Kalaburagi and Tumakuru districts of Karnataka and details are presented in Table 122.

#### **(b) Impact of contingency measures taken up in NICRA villages**

KVKs have successfully implemented contingency measures to alleviate the effect of dry spells on crops at various growth stages in NICRA villages of drought prone districts in Karnataka. Contingency measures adopted to overcome the impact of dry spells in crops such as pigeonpea, maize, blackgram, groundnut and foxtail millet crops in the districts of Chikkaballapur, Gadag, Davanagere and Belagavi have minimised the

impacts and realised better yields over the farmers practices. District wise details of contingency measures and its impacts are presented in Table 123.



Module-II : Foxtail millet+Pigeonpea intercropping system under NICRA (KVK, Gadag)



Module-II : Resource conservation and eco-friendly technology demonstration in paddy (KVK, Alapphuza)

### **Module III: Livestock and fisheries**

Improved shelters for reducing heat stress/ water logging/ flood and diseases in goat rearing, preventive vaccination, introduction of improved breeds, improved fodder/feed storage methods, prevention and control of diseases in dairy farming, area specific mineral mixture feeding to milking animals, feed management, IFS model, demonstration of year-round fodder production and azolla and culture of high value fish species in farm ponds etc. are the activities carried out under this module and details are furnished in Table 124. A total of 798 livestock demonstrations including poultry and fisheries have been covered under livestock interventions to tackle the adverse climatic conditions in the NICRA villages. Under general health check-up, preventive vaccination and deworming in livestock were under taken during the year. In poultry, backyard poultry breeds, slated poultry shelter for floods and feed supplementation were implemented. In fisheries, culture of high value fish species in farm ponds was demonstrated.

**Table 121: Performance of climate resilient crop production technologies in NICRA villages**

KVK	Interventions	Technology	Variety	Farmers (No.)	Area (ha)	Crop yield(q/ha)		
		Crop				Demo	Local	Increase (%)
Alappuzha	Short duration variety	Paddy	Manuratna	5	2.00	on going	-	-
	Resource conserving & eco -friendly technologies	Paddy	Uma	13	8.00	on going	-	-
	Utilising crop residues for mushroom cultivation	Mushroom	Oyster	1		on going	-	-
	ICM	Coconut	WCT	50	1.50	on going		
	Kerala total (a)			69	11.50			
Belagavi-I	Location specific intercropping systems	Blackgram + Pigeonpea	DBGV-5	18	31.15	10.89	6.80	60.14
		Pigeonpea +Soybean (1:3)	TS-3R	127	15.20	16.52	10.05	64.87
		Foxtailmillet+ Groundnut(1:4)	DHFT-109-3	4	1.40	18.97	11.50	64.95
	Drought tolerant varieties	Sorghum	SPV-2217	235	79.48			
	Drought tolerant varieties	Wheat	UAS-446	40	6.00			
	Total			424	133.23			
Cikkaballapura	Short duration varieties	Finger millet	ML-365	60	25.00	25.12	22.75	10.00
	Drought tolerant varieties	Pigeonpea	BRG-1	40	15.00	14.20	11.90	15.00
	Crop diversification	Castor	DCH-177	10	4.00	15.60	13.30	16.80
	Contingent crop	Foxtail millet	DHFT-103-1	8	3.00	15.90	13.90	14.30
	Green manuring in mango and cashew	Horsegram	PHG-9	40	15.00	8.75	7.80	12.17
	Nutrient spray during drought	Mango	Mango special	25	25.00	on going	-	-
	Total			183	87.00			
Davanagere	Location specific intercropping systems	Maize + Pigeonpea	TS-3R	50	20.00	63.55	58.52	17.12
		Maize + Pigeonpea	BRG-5	50	20.00	61.22	50.69	20.77
	Crop diversification	Fieldbean (avare)	HA-4	4	1.40	10.70	9.025	18.60
	Nutrient spray during drought	Maize	Private Hybrid	50	20.00	49.80	47.60	4.62
	Integrated crop management	Tomato	Private Hybrid	30	12.00	589.80	525.60	12.21
		Total			184	73.40		
Gadag	Improved varieties	Rabi Sorghum	SPV-2217	75	30.00	10.06	6.91	45.58
	Improved varieties	Bengalgram	JAKI-9218	15	6.00	7.85	5.08	54.52
	Location specific intercropping systems	Greengram & Pigeonpea	DGGV-2 & TS-3R	50	20.00	9.90	6.49	52.54
		Maize & Pigeonpea	Pvt hybrid & TS-3R	90	36.00	70.37	53.93	30.48
		Foxtail millet & pigeonpea	DHFT-109-03 & TS-3R	20	8.00	17.73	6.70	164.62
	Nutri-farms for nutritional Security	Mixed vegetables		5	5.00	Percentage adequacy of vegetables 38%		
	Total			255	105.00			
Kalaburagi-I	Seed treatment with CaCl <sub>2</sub> , Pulse magic for drought management	Pigeonpea	TS-3R	40	30.00	1.03	10.00	30.00
	Seed treatment with CaCl <sub>2</sub> , Chickpea magic for drought management.	Chickpea	BGD-103	5	5.00	11.10	8.20	35.30

Table contd...

	Location specific intercropping	Pigeonpea and coriander	TS-3R + Nutan	5	5.00	12.90 +17.60 (Coriander)	10.00	-
		Pigeonpea and Cucumber	TS3R + Samarth	1	1.00	12.50 +25.40 cucumber	10.10	-
	Cucumber	Samarth		2	2.00	24.50	18.90	29.60
	Total			53	43.00			
Tumakuru-II	Short duration varieties	Pigeonpea	BRG- 4	15	4.00	11.26	9.39	19.91
	Drought tolerant/ varieties	Finger millet	ML-365	117	48.00	32.83	24.17	35.83
		Finger millet	KMR-630	9	4.00	33.14	24.17	36.17
	Water saving paddy cultivation methods (aerobic paddy)	Paddy	MAS-946-1	41	18.00	36.57	29.91	22.27
		Location specific intercropping systems	Finger millet and Pigeonpea	ML-365+BRG-4/2	97	22.00	32.11+1.20	32.83
		Ground nut and Pigeonpea	Local+BRG - 4/2	42	12.00	10.20+1.20	10.40	-
	Total			321	108.00			
Karnataka total (b)			1420	549.63				
<b>Grand total (a + b)</b>				<b>1489</b>	<b>561.13</b>			

**Table 122:Dissemination of climate resilient varieties through state department plan during *kharif* 2020 in NICRA districts**

KVK	Crop	State Department plan during <i>Kharif</i> 2020 in NICRA districts	
		Climate resilient varieties	Approximate area (ha)
Belagavi-1	Pigeonpea	TS-3R	35.00
	Blackgram	DBGV-5	51.00
	Foxtail millet	DHFT-109-3	4.40
	Sorghum	GS-23	180.00
	Wheat	UAS-446	120.00
Chikkaballapura	Finger millet	ML-365	2360.00
	Foxtail millet	DHFT-103-1	450.00
	Little millet	Local	760.00
	Fodder crop	COFS-31	110.00
	Pigeonpea	BRG_1	4500.00
Davanagere	Pigeonpea	BRG-5	200.00
	Pigeonpea	TS-3R	250.00
	Finger millet	ML 365	60.00
	Fodder crop	CoFS-29/31	40.00
Gadag	Greengram	DGGV-2	4500.00
	Pigeonpea	TS-3R	18000.00
Kalaburagi-I	Pigeonpea	TS-3R	225000.00
Tumakuru-II	Finger millet	Finger millet-ML-365	3627.00
	Pigeonpea	Pigeon pea BRG-2	3104.00
<b>Total</b>			<b>263351.40</b>

**Table 123: Details of contingency measures to combat the dry spells implemented and its impact on crop production under NICRA during 2020**

KVK	Dry spell days (No.)	Period (From... to...)	Crop	Affected crop stage	Intervention	Farmers (No.)	Impact on crop yield (q/ha)		
							Farmers' practice	Demo	Increase (%)
Belagavi-I	>10	22.08.2020 to 31.08.2020	Pigeonpea	Flowering	Seed hardening and seed treatment with bio fertilizers and provided need based information	127	9.62	16.22	68.75
		22.08.2020 to 31.08.2020	Blackgram	Flowering	Seed hardening and seed treatment with bio fertilizers	18	6.80	10.89	60.14
		22.08.2020 to 31.08.2020	Foxtail millet	Pod formation	Pest and disease management, protective irrigation, foliar spray with KNO <sub>3</sub>	67	11.50	19.05	65.65
Chikkaballapura	10	08.08.2020 to 18.08.2020	Pigeonpea	Vegetative	Thinning and spray of potash	100	11.90	14.20	15.00
	10	08.08.2020 to 18.08.2020	Groundnut	Vegetative and flowering	Thinning	50	13.25	15.25	11.50
Davanagere	20	05.06.2020 to 25.06.2020	Maize	Early and vegetative	Spraying of water soluble fertilisers and protective irrigation	50	47.60	49.80	4.62
	10	27.06.2020 to 08.07.2020	Maize + Pigeonpea	Vegetative	Spraying of watersoluble fertilisers, protective irrigation, spraying of Emmactin Benzoate	50	50.69	61.22	20.77
Gadag	67	01.11.2020 to 06.01.2021	Pigeonpea	Pod development	Foliar spray of 19:19:19 and KNO <sub>3</sub> for inducing drought tolerance	150	5.13	6.04	17.73



Module-III : Culture of high value fish species in farm ponds (KVK, Davanagere)



Module-III : Animal health camp (KVK, Chikkaballapur)

**Table 124: Climate resilient technologies demonstrated under livestock and fisheries**

KVK	Interventions	Technology demonstrated	Demos (No.)	Area (ha)/ No.	Measurable indicator and Unit	Output	
						Demo	Local
Alappuzha	Improved shelters for goat rearing	Climate resilient poultry shelter	10	250 birds	Mortality (%)	14.00	-
		Fabrication of goat shed with raised platform	6	6 units			ongoing
	Integrated Farming System Prevention and control of diseases in dairy farming Kerala total (a)	Rice-fish-duck-vegetable model	2	2 units	Mastitis (%)	0	ongoing
		Management of Mastitis disease	25	25 animals			32.00
			43				
Belagavi-I	Improved feeding for milch animals	Silage	10	10 animals	Milk yield/cow/day	4.30	3.90
		Protective fodder storage	10	10 animals	Prevention of 15-20% loss of stored fodder due to rain and sunlight		
		Mineral mixture	50	50 animals	Milk yield/cow/day	4.20	3.95
	Preventive vaccination (Animal HelathCanp ) Disease management in cows	Vaccination, deworming and need based treatment	50	286 animals	-	-	-
		Cow mat	10	10 animals			
Chikkaballapura	New fodder crops or new varieties	Drought tolerant multi-cut fodder sorghum (CoFS-31)	100	10	Green fodder (t/ha)	152.00	130.00
		Azolla feed supplement for milch animals	50	50 animals			
	Poultry/goat/fish breeds	Upgradation of backyard poultry	80	800 birds			
		Culture of high value fish species in farm ponds	10	2 units			
Davanagere	New fodder crops or new varieties	Drought tolerant multi-cut fodder Sorghum (CoFS-31)	100	10.00 ha	Green fodder (t/ha)	165.20 t/ha	148.70 t/ha
	Improved feeding for milch animals	Feeding vitamins and minerals supplements to milch animals during summers to alleviate heat stress	50	50 milch animals		-	-

Table contd...

	Fish breeds	Culture of high value fish species in farm ponds	2	2 units			
	Improved feeding for milch animals	Feeding vitamins and minerals supplements to milch animals during summers to alleviate heat stress	50	50 animals			
Gadag	Fodder crops/suppliments	Year-round fodder production and azolla	10	10 animals	Milk yield/ cow/day	8.45	7.20
	Goat breed	Upgradation of local goat with Jamunapari buck	6	6 animals			
	Animal feed	Area specific mineral mixture to milch animals	10	10 animals	Milk yield/ cow/day	8.20	7.00
Kalaburagi-I	Preventive vaccinations	Foot and mouth disease vaccination (2 times in a year)	35	120 animals			
	Fodderstorage	Silage making	4	4 animals			
Tumakuru-II	New fodder crops or new varieties	Cultivation of drought tolerant multi-cut fodder Sorghum CoFS-31	73	8.00 ha	Green fodder (t/ha)	279.61	689.40
	Improved feeding for milch animals	Feeding vitamins and mineral supplements to milch animals during summers to alleviate heat stress	45	136 animals	Milk yiled in lit for 6 months	1512.00	1314.00
	<b>Karnataka total (b)</b>		<b>755</b>				
	<b>Grandtotal (a + b)</b>		<b>798</b>				

#### 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, climate literacy through a village weather station were implemented and details are presented in Table 125.



Module-IV : Coconut guards at work (KVK, Alapphuza)

#### (a) Extension activities

A total of 191 extension activities have been carried out to create awareness among the community about the climate related impacts on the agriculture and related sector through various activities with the participation of 2119 farmers including 271 women (Table 126). About 131 farmers including five women farmers were taken on exposure visits to various places/intuitions by the NICRA KVKs.

#### (b) Capacity development to farmers

KVKs have conducted 68 capacity development courses related to climate resilient agriculture under NICRA covering topics such as crop production, natural resource management, livestock, ICM, INM, IPDM, value addition and dry land technologies wherein trained 1732 farmers including 218 women and details are provided in Table 127.

Table 125: Institutional interventions implemented under NICRA villages

KVK	Interventions	Activity		Farmers involved benefitted (No.)	Unit/No./Area (ha)
		Crop/Variety/ commodity group/ Implements	Quantity produced (q)/ No. /Rent ( ₹ )/Area(ha)		
Alleppey	Coconut guards	1 batch	-	9	-
Belagavi-I	Seed bank	Wheat (DWR-2006), sorghum(M- 35-1) and chickpea (JAKI-9218)	Wheat (DWR-2006)- 450 kgs, Sorghum(M- 35-1)- 285 kgs and chickpea (JAKI-9218)- 1350 kgs	130	130.00
Chikkaballapura	Seed bank	COFS-31	50 kgs of COFS-31 seeds	20	50.00
Davanagere	Custom hiring centre	Small implements	-	43	31.50
	Climate literacy through a village level weather station			150	60.00
Gadag	Seed bank	Foxtail Millet (DHFt-109-03)	1.00 q	15	6.00
		Pigeonpea (TS-3R)	2.00 q	20	8.00
		Rabi sorghum (SPV-2217)	2.00 q	20	8.00
	Fodder bank	Rabi sorghum (M-35-1)	36 q of hay	15	8.00
		Rabi sorghum (SPV-2217)	45 q of hay	30	12.00
	Custom hiring centre	MB Plough	₹ 8050 rental charge	113	118.40
Kalaburagi-I	Fodder bank	CoFS-29, CoFS-31, lucerne, hedge lucerne, hybrid napier	1650 t	120	20.00
	Custom hiring centre	5 implements	₹ 5800 rental charge	50	50.00
Tumakuru-II	Climate literacy through a village level weather station	-	-	124	157.00

**Table 126: Extension activities organized under NICRA**

KVK	Extension activity	Programmes (No.)	Participants (No.)		
			Male	Female	Total
Alappuzha	Method demonstrations	5	8	37	45
	Camps and campaigns	2	15	0	15
	Kerala total (a)	7	23	37	60
Belagavi-I	Strengthening SHGs	2	22	12	34
	Field days	5	126	35	161
	Awareness	2	32	11	43
	Field visits	56	73	36	109
	Diagnostic visits	31	54	16	70
	Method demonstrations	4	76	4	80
	Total	100	383	114	497
Chikkaballapura	Field day	4	48	18	66
	Method demonstrations	1	13	7	20
	Awareness camps	1	13	0	13
	Awareness camps	1	15	0	15
	Kisan day and exhibition	1	52	8	60
	Total	8	141	33	174
Davanagere	Exposure visits of students	1	1	5	6
	Field day	3	64	26	90
	Method demonstrations	11	319	13	332
	Awareness camps	2	28	0	28
	Kisan day and exhibition	2	179	9	188
	Total	19	591	53	644
Gadag	Exposure visits of farmers	3	89	0	89
	Field days	3	150	0	150
	Method demonstrations	7	70	2	72
	Awareness programmes	3	84	0	84
	Diagnostic visit	4	28	0	28
	Field visits	30	118	2	120
	Total	50	539	4	543
Kalaburagi-I	Field days	1	75	25	100
	Method demonstrations	3	40	0	40
	Total	4	115	25	140
Tumakuru-II	Exposure visits of farmers	1	37	5	42
	FPO activities	2	19	0	19
	Total	3	56	5	61
	Karnataka total (b)	184	1825	234	2059
	<b>Grand total (a + b)</b>	<b>191</b>	<b>1848</b>	<b>271</b>	<b>2119</b>

**Table127: Capacity development training courses organized under NICRA**

KVK	Capacity development courses (No.)	Participants (No.)		
		Male	Female	Total
Alappuzha	8	57	43	100
Belagavi-I	10	289	71	360
Chikkaballapura	10	106	34	140
Davanagere	21	637	21	658
Gadag	13	302	31	333
Kalaburagi-I	4	61	0	61
Tumakuru-II	2	62	18	80
<b>Total</b>	<b>68</b>	<b>1514</b>	<b>218</b>	<b>1732</b>

### 3.2.5 Skill Development Programme

#### (a) State wise

A total of 42 skill development programmes were conducted by 25 KVKs of Zone XI and trained 803 participants (Table 128) of which 16 KVKs of Karnataka conducted 27 programmes with 511 participants and 9 KVKs of Kerala conducted 15 programmes with 292 participants.

#### (b) Job role wise

Skill development programmes conducted on 11 job roles in Zone XI (Table 129) are given state-wise in Tables 130 and 131 for Karnataka and Kerala, respectively. Data from Table 129 indicated that more programmes were conducted (7 each) on job roles of dairy farmer/entrepreneur and organic grower with the participation of 144 and 140, respectively followed by six programmes each on friends of coconut tree and nursery worker. Data in Table 130 shows that more programmes (6) were conducted by KVKs of Karnataka on job role with dairy farmer/entrepreneur followed by five programmes each on nursery worker and organic grower. Data in Table 131 shows that more programmes (three) were conducted by KVKs of Kerala on job role with mushroom grower followed by two programmes each on friends of coconut tree, organic grower, small poultry farmer. It was observed that the women participation was more than men as indicated by 148 women out of a total of 292 participants in Kerala.



ASCI training for mushroom growers (KVK, Tumakuru-II)



ASCI training for friends of coconut tree (KVK, Davanagere)



ASCI training for poultry farmers (KVK, Alappuzha)



Organic grower assessment through method demonstration by ASCI (KVK, Belagavi-I)

**Table 128: Skill development programmes conducted by KVKs in Zone XI**

State	KVK (No.)	Programmes (No.)	Participants (No.)
Karnataka	16	27	511
Kerala	9	15	292
<b>Total</b>	<b>25</b>	<b>42</b>	<b>803</b>

**Table 129: Job-role wise skill development programmes conducted by KVKs in Zone XI**

Job role	Programmes (No.)	General			SC/ST			Participants (No.)		
		Grand total			Grand total			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Assistant gardener	1	3	10	13	0	5	5	3	15	18
Bee keeper	2	24	1	25	25	0	25	49	1	50
Dairy farmer/entrepreneur	7	105	10	100	26	3	29	131	13	144
Friends of coconut tree	6	94	7	101	13	1	14	89	6	95
Micro irrigation technician	1	18	0	18	2	0	2	20	0	20
Mushroom grower	5	48	42	90	0	5	5	31	44	75
Nursery worker	6	75	26	101	15	5	20	90	31	121
Organic grower	7	106	24	130	9	1	10	115	25	140
Quality seed grower	1	16	0	16	4	0	4	20	0	20
Small poultry farmer	3	31	20	51	8	1	22	39	21	60
Vermicompost producer	3	33	20	53	3	4	26	36	24	60
<b>Total</b>	<b>42</b>	<b>553</b>	<b>160</b>	<b>698</b>	<b>105</b>	<b>25</b>	<b>162</b>	<b>623</b>	<b>180</b>	<b>803</b>

**Table 130: Job-role wise skill development programmes conducted by KVKs in Karnataka**

Job role	Programmes (No.)	General			SC/ST			Participants (No.)		
		Grand total			Grand total			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Bee keeper	1	24	1	25	5	0	5	29	1	30
Dairy farmer/entrepreneur	6	98	0	83	21	1	22	119	1	120
Friends of coconut tree	4	69	2	71	9	0	9	60	0	60
Mushroom grower	2	28	12	40	0	0	0	11	9	20
Nursery worker	5	74	10	84	15	2	17	89	12	101
Organic grower	5	88	2	90	9	1	10	97	3	100
Quality seed grower	1	16	0	16	4	0	4	20	0	20
Small poultry farmer	1	13	0	13	7	0	20	20	0	20
Vermicompost producer	2	31	6	37	3	0	22	34	6	40
<b>Total</b>	<b>27</b>	<b>441</b>	<b>33</b>	<b>459</b>	<b>73</b>	<b>4</b>	<b>109</b>	<b>479</b>	<b>32</b>	<b>511</b>

**Table 131: Job-role wise skill development programmes conducted by KVKs in Kerala**

Job role	Programmes (No.)	General			SC/ST			Participants (No.)		
		Grand total			Grand total			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Assistant gardener	1	3	10	13	0	5	5	3	15	18
Bee keeper	1	0	0	0	20	0	20	20	0	20
Dairy farmer/entrepreneur	1	7	10	17	5	2	7	12	12	24
Friends of coconut tree	2	25	5	30	4	1	5	29	6	35
Micro irrigation technician	1	18	0	18	2	0	2	20	0	20
Mushroom grower	3	20	30	50	0	5	5	20	35	55
Nursery worker	1	1	16	17	0	3	3	1	19	20
Organic grower	2	18	22	40	0	0	0	18	22	40
Small poultry farmer	2	18	20	38	1	1	2	19	21	40
Vermi compost producer	1	2	14	16	0	4	4	2	18	20
<b>Total</b>	<b>15</b>	<b>112</b>	<b>127</b>	<b>239</b>	<b>32</b>	<b>21</b>	<b>53</b>	<b>144</b>	<b>148</b>	<b>292</b>

**3.2.6 Attracting and Retaining Youth in Agriculture (ARYA)**

The ICAR project “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 potential youth and trained them on entrepreneurship development skills by providing a basket of options to start agricultural ventures for self-employment.

Six KVKs viz., Bengaluru Rural, Shivamogga, Uttara

Kannada, Kannur, Pathanamthitta and Malappuram have implemented ARYA project in ICAR-ATARI, Zone XI and organized 115 training programmes on income generating activities wherein trained 743 rural youth (Table 132). Out of which, more trainings (43) were organized by Pathanamthitta with the participation of 178 rural youth followed by Shivamogga (21 programmes for 121 rural youth), Uttara Kannada (19 programmes with 155 rural youth), Bengaluru Rural (18 programmes for 60 rural youth) and Kannur (14 programmes with 229 rural youth). Data in Table 133 indicated that ARYA KVK centers have

trained rural youth on six enterprises like processing and value addition (174), mushroom production (137), poultry and goat rearing (126), bee keeping (125), nursery (124) and coconut palm climbing (57) which resulted in establishment and management of 227 enterprising units by the trained youth. KVK, Malapuram has started its ARYA activities from January, 2021.

### 3.2.7 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 its KVKs during 16-31 December,

2020 and organized day wise activities as per the guidelines provided by the ICAR, New Delhi. Date and activity wise programmes organized by KVKs of Zone-XI during Swachhta Pakhwada are given in Table 134.

Data shows that KVKs organized various activities with the participation of 16377 participants of different categories like farmers, farm women, rural youth, school children, extension personnel, other stakeholders and general public. Out of which KVKs of Karnataka conducted Swachhta activities by involving 12746 participants, KVKs of Kerala conducted Swachhta activities by involving 3315 participants and KVK, Lakshadweep conducted Swachhta activities by involving 316 participants.

**Table 132: Center-wise training programmes organized for rural youth under ARYA**

ARYA KVK centers	Training programmes (No.)	Rural youth trained (No.)
Pathanamthitta	43	178
Shivamogga	21	121
Uttara Kannada	19	155
Bengaluru Rural	18	60
Kannur	14	229
<b>Total</b>	<b>115</b>	<b>743</b>

**Table 133: Enterprise-wise rural youth trained and enterprises established under ARYA**

Enterprises	Rural youth trained (No.)	Units established (No.)
Processing and value addition	174	31
Mushroom production	137	75
Poultry and goat rearing	126	13
Bee keeping	125	61
Nursery	124	27
Coconut palm climbing	57	20
<b>Total</b>	<b>743</b>	<b>227</b>

**Table 134: Date and activity wise programmes organized by KVKs of Zone-XI during Swachhta Pakhwada**

Date	Activities	Participants (No.)			
		Karnataka	Kerala	Lakshadweep	Total
16.12.2020	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.	319	216	15	550
17.12.2020	Basic maintenance: Stock taking on digitization of office records/ e-office implementation. Cleanliness drive including cleaning of offices, corridors and premises.	342	146	9	497

18.12.2020	Sanitation and SWM cleanliness and sanitation drive in the villages adopted under the MeraGaonMera Gaurav programme by ICAR Institutes/KVKs involving village community.	321	172	9	502
19.12.2020	Sanitation and SWM cleanliness and sanitation drive within campuses and surroundings including residential colonies, commonmarket places.	358	127	23	508
20.12.2020	Stock taking of waste management and other activities including utilization of organicwastes/generationofwe althfromwaste,polythene freest atus,compostingofkitchenandh omewaste materials, promoting clean and green technologies and organic farming practices in kitchen gardensofresidentialcolonies/o nenearybyvillageandprovingont hespottechnologysolution.	5244	35	24	5303
21.12.2020	Campaign on cleaning of sewage and water lines, awareness on recycling of waste water, water harvesting for agriculture/ horticulture application/kitchen garden in residential colonies/1-2 near by villages.	400	104	24	528
22.12.2020	Organizing workshops, debate, exhibitions, technology demonstrations on agricultural technologies for conversion of waste to wealth safe disposal of all kinds of wastes.	490	192	0	682
23.12.2020	Celebration of special day- kisandiwas (farmer's day) on 23 December involving farmers.	1290	418	40	1748
24.12.2020	Swachhta Awareness at local level (organizing sanitation campaigns involving and with thehelpofthefarmers,farmwom enandvillageyouthinnewvillag esnotadoptedanybyinstitutes/e stablishments.	440	161	0	601

25.12.2020	Cleaning of public places, community market places and/or nearby tourist/selected spots.	703	180	0	883
26.12.2020	Fostering healthy competition: Organizing competition awarding best offices/residential areas/campuses on cleanliness. quiz, essay and drawing competitions for school children, village youth.	756	179	0	935
27.12.2020	Awareness on waste management and other activities including utilization of organic wastes/generation of wealth from waste, polythene free status, composting of kitchen and household waste materials, promoting clean and green technologies and organic farming practices in new area.	230	99	21	350
28.12.2020	Campaign on cleaning of sewerage and waterlines, 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.	528	121	30	679
29.12.2020	Visits of community waste disposal sites/compost pits, cleaning and creating awareness on treatment & safe disposal of bio-degradable/non-bio-degradable wastes by involving civil/farming community.	364	177	31	572
30.12.2020	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.	351	496	41	888
31.12.2020	Organization of press conference for highlighting the activities of Swachh Bharat Pakhwada by involving all stakeholders including farmers/VIPs/press and electronic media.	610	492	49	1151
<b>Total</b>		<b>12746</b>	<b>3315</b>	<b>316</b>	<b>16377</b>



Swachhata oath taking (ICAR-ATARI, Bengaluru)



Tree plantation (KVK, Alappuzha)



Swachhata pakhwada (KVK, Ramanagara)

### 3.2.8 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-Indian Institute of Horticultural Research (IIHR), Bengaluru; ICAR-National Institute of Animal Nutrition and Physiology (NIANP), Bengaluru; ICAR- National Bureau of Agricultural Insect Resources (NBAIR), Bengaluru; ICAR- National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI), Bengaluru; ICAR-Directorate of Cashew Research (DCR), Puttur in Karnataka, ICAR-Central Plantation

Crops Research Institute (CPCRI), Kasaragod; ICAR-Central Tuber Crops Research Institute (CTCRI), Trivandrum; ICAR-Indian Institute of Spices Research (IISR), Kozhikode; ICAR-Central Marine Fisheries Research Institute (CMFRI), Cochin; and ICAR-Central Institute of Fisheries Technology (CIFT), Chochin in Kerala implemented MG-MG programme through formation of 126 multidisciplinary teams of scientists. These scientist teams extended farm advisories in agriculture and allied sectors as well as disseminated latest agricultural technologies through organization of different extension activities by involving farmers and other stakeholders in 565 adopted villages. Activities included mobile based advisories, extension literature, team visits to villages, interface meetings, awareness programmes, method demonstrations, training programmes, facilitating linkages with line departments and other development agencies, seeds of latest varieties, latest livestock breeds, latest production technologies and crop diversification.



Providing fodder seeds and demonstration on azolla production for women dairy farmers in MG-MG adopted villages by Scientists team, ICAR-NIANP, Bengaluru





Providing California mastitis test kits and leaflets to the livestock farmers in MGMG adopted villages by Scientists team, ICAR-NIVEDI, Bengaluru



Demonstration on biocontrol agents for the management of rugose spiralling whitefly of coconut in MGMG adopted villages by Scientists team of ICAR-NBAIR, Bengaluru



Providing liquid organic manures and planting materials of new varieties of tuber crops to the farmers in MGMG adopted villages by Scientists team, ICAR-CTCRI, Thiruvananthapuram



Field day on cashew orchards at Kundapura and Karna of MGMG villages by Scientists team, ICAR-DCR, Puttur

### 3.2.9 District Agricultural Meteorological Units under KVKs

Gramin Krishi Mausam Sewa (GKMS) is the flagship programme of Government of India for weather related services to the farmers aiding in decision making on day-to-day agricultural operations. The scheme is extended to Krishi Vigyan Kendras to address block level weather needs of farmers at micro-level and it is named as District Agricultural Meteorological Unit (DAMU). This is a joint effort of Indian Meteorological Department (IMD) and ICAR with multi-organizational collaboration to implement various components.

The scheme DAMU is in operation at 16 KVKs of Zone XI, ATARI, Bengaluru, 12 in Karnataka, three in Kerala and one in Lakshadweep since 2019 during first phase. These DAMUs are multidisciplinary units responsible for preparation and dissemination of district and sub-district agro-met advisories. The methodology followed is given below:

- Advisory bulletins are issuing twice in a week on every Tuesday and Friday along with weather forecast for next 5 days.
- The weather forecasts for the next five days are given numerically by Meteorological Centre, IMD, Bengaluru for Karnataka and Meteorological Centre, IMD, Thiruvananthapuram for Kerala on every Tuesday and Friday by email, which are interpreted according to the charts provided.
- The forecasts are issued in simple local language for better understanding by farmers. The farmers are

informed regarding forecast and guided to plan field operations with suitable modification, if needed.

- The review of crop growth stages, list of probable field operations to be carried out during the week, pest and disease occurrence and their control etc. are considered while preparing the bulletin in consultation with subject matter specialists.
- The bulletins have been disseminated by KVKs to district agriculture departments, research centres, NGO and contact farmers through m-Kisan portal, email, whatsapp, news paper, telephonic and direct contact.

By following the above methodology, 16 DAMU KVKs have generated 4106 agro advisories and disseminated to 973943 farmers. These DAMUs have also prepared 323 advisories (SMSs) and sent to 450818 farmers through Kisan Portal. In addition, DAMUs have conducted 267 awareness programmes benefitting 16236 farmers and also have developed 52 videos on district specific weather related aspects and disseminated to 492584 farmers through registered whatsapp groups. The progress achieved by each KVK is given in Table 135. The feedback obtained from the stakeholders indicated that the AAS bulletins issued by DAMUs have been useful to the farmers as well as extension workers of the district. According to the feedback received from the registered farmers, the bulletins and telephonic mode of communication were useful to take up agricultural operations such as land

**Table 135: Progress of DAMUs under ATARI, Bengaluru during 2021**

KVK	Agro advisories generated and disseminated			SMS sent through Kisan Portal		Awareness		Videos developed and disseminated	
	Agro advisories (No.)	Farmers registered (No.)	Farmers (No.)	SMSs (No.)	Farmers (No.)	Programmes (No.)	Farmers (No.)	Videos (No.)	Farmers (No.)
<b>Karnataka</b>									
Bagalkot	73	200	200	0	0	8	235	2	500
Bellary	94	20580	21,500	8	9000	7	300	1	3250
Chamarjanagara	104	16385	41385	31	37515	22	607	4	1781
Chikkamagaluru	95	406785	700506	13	163184	34	1642	13	214805
Haveri	21	1250	10000	24	39248	21	698	5	500
Kodagu	1450	6051	9850	14	4521	27	2665	3	1100
Kolar	78	6221	5980	2	24739	13	785	2	34280
Koppal	88	10714	10714	20	9050	21	917	7	925
Mandya	103	53300	53300	15	47300	23	781	4	680
Ramanagara	333	28000	25600	15	45541	34	1022	2	3200
Tumukuru	113	67000	80000	171	67500	25	1161	4	226600
Yadgir	63	2000	2000	10		12	1000	2	100
<b>Kerala</b>									
Kollam	104	1365	1365	-	-	11	1991	2	2763
Mallapuram	104	1200	2500	-	-	3	1500	1	2100
Palakkad	1218	322	9000	-	3220	2	800	-	-
Lakshadweep									
Lakshadweep	65	43	43	-	-	4	132	-	-
<b>Total</b>	<b>4106</b>	<b>621416</b>	<b>973943</b>	<b>323</b>	<b>450818</b>	<b>267</b>	<b>16236</b>	<b>52</b>	<b>492584</b>

preparation, sowing of crops, irrigation during non-rainy days, fertilizer application and spraying during calm and clear weather conditions. Dry period during harvesting of the crop and the information regarding the incidence of pest/diseases and their control measures were most useful to the farmers.



Newspaper coverage of DAMU (KVK, Mandya)



On campus farmers awareness programme on DAMU (KVK, Ramanagara)



District level Technical Expert Committee meeting (KVK, Chickmagalur)

### 3.2.10 Micro-irrigation Systems

Water being the most critical input for agriculture, its judicious use is important to ensure sustainable agricultural development and food security. The Department of Agriculture, Cooperation & Farmers

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

- (i) Establish demonstration units on micro irrigation systems suitable to local agro-climatic conditions taking into consideration the concept of water use efficiency, and
- (ii) Showcase the benefits of established demonstrations on micro irrigation systems to farmers for encouraging them to adopt these technologies for enhancing water use efficiency, increase productivity of crops and income 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 have established demonstration units on micro irrigation systems. As per the guidelines provided by the ICAR, established drip, sprinkler, micro-sprinkler and mist irrigations in KVKs instructional farms. KVKs conducted 5 training programmes on micro-irrigation systems wherein trained 247 farmers. Further, farmers and extension personnel were apprised about know-how and do-how on micro-irrigation demonstrations during their visit to KVKs.

### 3.2.11 Farmer FIRST Project

Farmer FIRST (Farm, Innovations, Resources, Science, 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.
- **Technology assemblage, application and feedback:** Integrating the components of technology for application in different agro-ecosystems with focus on innovations and feedback.
- **Partnership and institutional building:** Partnership with different stakeholders, development of rural based institutions, agro-ecosystem and stakeholders analysis and impact studies for data base creation.
- **Content mobilization:** 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 three 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 136.

The 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 137. Data shows that 822 demonstrations with 2746 farm families were conducted by FFP institutes under NRM module (26 demos with 271 families), crop module (601 demos with 1223 families), horticulture module (121 demos with 221 families), livestock module (51 demos with 984 families having 4142 animals) and IFS module (23 demos with 47 families). Further, 308 extension programmes were organized by FFP institutes with the participation of 2897 farmers. Module wise progress of technological interventions is discussed below.

**Table 136. Brief profile of adopted villages under FFP**

Institute	Adopted villages	Families covered (No.)	Major crops	Major enterprises
ICAR-CPCRI Regional Station, Kayamkulam (ICAR-CPCRI, Kasaragod)	Pathiyoor and Keerikkad	4220	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, keraprobio production, vermicompost production
ICAR-IIHR, Bengaluru	Vasappanad oddi, Yeramgere, Balepura, Kebbedoddi, Hosadurga and Thattiguppe	529	Finger millet, pigeonpea, field bean, tomato, chilli, french bean, tuberose	Dairy, small ruminants, fishery
ICAR-NIANP, Bangalore	Lekshmidevi pura, Timmajanah alli and S. Nagenahalli	500	Ragi, maize, pigeonpea and vegetables	Agriculture and dairying

**Table 137: Institute wise interventions implemented under FFP**

Institute	NRM module		Crop module		Horticulture module		Livestock module			IFS module		Extension activities	
	Demos (No.)	Families (No.)	Demos (No.)	Families (No.)	Demos (No.)	Families (No.)	Demos (No.)	Families (No.)	Animals (No.)	Demos (No.)	Families (No.)	Programmes (No.)	Farmers (No.)
ICAR-CPCRI Regional Station, Kayamkulam (ICAR-CPCRI, Kasaragod)	2	256	5	621	3	132	4	190	3075	1	25	296	2598
ICAR-IIHR, Bengaluru	24	15	590	425	115	73	20	15	60	18	12	10	245
ICAR-NIANP, Bengaluru	-	-	6	177	3	16	27	779	1007	4	10	2	54
<b>Total</b>	<b>26</b>	<b>271</b>	<b>601</b>	<b>1223</b>	<b>121</b>	<b>221</b>	<b>51</b>	<b>984</b>	<b>4142</b>	<b>23</b>	<b>47</b>	<b>308</b>	<b>2897</b>

**(a) NRM module**

Technology wise interventions implemented under NRM module by FFP institutes are presented in Table 138. Data indicated that a total of 271 farmers were involved in demonstrations of improved technologies in 87.35 ha spread over the project villages. ICAR-CPCRI RS conducted demonstrations on soil based nutrient management and pond reclamation including refinement for water conservation by involving 168 and 88 farmers covering 75.00 and 5.34 ha, respectively. ICAR-IIHR conducted demonstrations on soil and water conservation practices with borewell recharge and Integrated Nutrient Management for field and horticulture crops by involving 5 and 10 farmers covering 3 and 4 ha, respectively.

**(b) Crop module**

It consists of introducing improved high yielding varieties, cultivation practices, plant protection measures, high density planting, nutrient management etc. to achieve sustainable production. Technology wise interventions implemented under crop module by FFP institutes are presented in Table 139. Data revealed that a total of 1230 farmers were involved in demonstrations of improved technologies on 410.38 ha spread over in different cluster of villages. Demonstration on integrated management of root (wilt) disease affected by coconut palms gave yield of 7002 nuts/ha with net return of ₹. 108527 as compared to 4288 nuts/ha with net return of ₹. 65824 under check. Similarly, all other technology demonstrations conducted by FFP gave high yield as well as high net return to the farmers as compared to their respective checks. Further, demonstration conducted by ICAR-CPCRI RS on micro nutrient mix (KalpaVardhini) in coconut was new to the farmers and there by net return ( ₹. 112854/ha) obtained is considered as additional income to the farmers.



Ragi ML 365 demonstration (ICAR-IIHR, Bengaluru)



Sesame harvest (ICAR-CPCRI RS, Kayamkulam)

**(c) Horticulture module**

Technology wise interventions implemented under horticulture module by FFP institutes are presented in Table 140. A total of 143 farmers were involved in demonstrations of improved technologies in 33.70 ha spread over in different cluster of villages. Demonstration on Gajendra variety of Amorphophallus as intercrop by ICAR-CPCRI RS gave yield of 250.00 q/ha with net return of ₹.450000 as compared to

**Table 138: Technology wise interventions implemented under NRM module by FFP institutes**

Institute	Intervention / technology	Farmers (No.)	Area (ha)	Measurable indicators	Remarks
ICAR- CPCRI RS, Kayamkulam (ICAR- CRCRI, Kasaragod) CPCRI Kasaragod	Soil test based nutrient management and soil health card distribution	168	75.00	Cost reduction (2.01 lakh rupees reduction in total chemical fertilizers for coconut only)	Reduction of 20% to 30% cost of fertilizers in crops other than coconut
	Pond reclamation and refinement for water conservation	88	5.34	Average income of Rs. 42003.80/unit	Produced 131670 fish fingerlings (Anabas and nile tilapia)
ICAR-IIHR, Bengaluru	Soil and water conservation practices and activities on borewell recharge	5	3.00	Prevention of soil erosion through graded slopes, raised bed cultivation and mulching  Drip irrigation to save water and fertigation to save quantity and cost of nutrient application	Impact of borewell recharge is yet to be studied
	Integrated Nutrient Management for field and horticulture crops	10	4.00	Saving of cost and reduction in quantity of fertilizers  Increase in yield and net-income  Increase in quality of produce in horticulture and field crops	Quality of produce enhanced the marketability and market price
<b>Total</b>		<b>271</b>	<b>87.35</b>		

170.00q/ha with net return of ₹. 260000 under check, demonstration on tomato (ArkaRakshak) with precision farming package by ICAR-IIHR gave yield of 106.00 q/ha with net return of ₹.684550 as compared to

58.50 q/ha with net return of ₹. 323000 under check and demonstration on okra (Arka Anamika) by ICAR-NIANP gave yield of 14.60 q/ha with net return of 421400 as compared to 11.50 q/ha under check.

**Table 139: Technology wise interventions implemented under crop module by FFP institutes**

Institute	Intervention/t echnology	Farmers (No.)	Area (ha)	Yield			Economics ( ₹./ha)			
				Demo (q/ha)	Local (q/ha)	Increase (%)	Demo		Check	
							Gross return	Net return	Gross return	Net return
ICAR-CPCRI RS, Kayamkulam (ICAR-CRCRI, Kasaragod)	Integrated root (wilt) disease management in coconut	165	71.00 ha (11462 coconut palms)	7002 nuts/ha	4288 nuts/ha	63.29	168048	108527	90048	65824
	Micro nutrient mix(KalpaVar dhini) in coconut	112	57.00 ha (8073 coconut palms)	6348 nuts/ha	New technology	31.68 additional nut yield	152352	112854	New technology	New technology
	Sesamum(Kay amkulam- 1, Thilak)and INM	281	71.28	5.10	1.74	193.00	127500	85000	43500	32000
	Ragi (Payyur - 2)	19	23.40	7.30	Nil	100.00	36500	27000	Nil	Nil
	Fodder (CO 5) andmaize (African tall)	51	25.70	48.00	10.00	380.00	14400	10500	Nil	Nil
ICAR-IIHR, Bengaluru	Ragi (ML- 365)	233	46.60	52.50	24.00	118.75	172987	126000	74400	55200
	Pigeonpea (BRG- 5)	152	30.40	6.50	3.00	117.00	56250	42500	28750	20000
	Field bean (HA- 4)	40	8.00	8.00	3.50	128.50	40600	31450	16,800	11075
ICAR-NIANP, Bengaluru	Ragi (ML- 365)	94	115.00	1.56	0.90	39.40	37940	15690	33000	12000
	Pigeonpea (BRG- 5)	83	90.00	87.00	72.00	17.30	129000	110000	-	-
	<b>Total</b>	<b>1230</b>	<b>410.38</b>							

**Table 140: Technology wise interventions implemented under horticulture module by FFP institutes**

Institute	Intervention / technology	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics ( ₹./ha)			
				Demo (q/ha)	Local (q/ha)	Increase (%)	Demo		Check	
							Gross return	Net return	Gross return	Net return
ICAR-CPCRI RS, Kayamkulam (ICAR-CRCRI, Kasaragod)	Amorphophallus (Gajendra)	34	3.80	250.00	170.00	47.05	750000	450000	510000	260000
	Turmeric (Pragathi and Prathibha)	10	2.70	200.00	120.00	66.66	800000	687500	360000	280000
	Integrated nematode management in coconut intercroops	10	3.50	In progress	In progress	In progress	In progress	In progress	-	-
ICAR-IIHR, Bengaluru	Tomato (ArkaRakshak) with precision farming package	5	1.20	106.00	58.50	81.20	1272000	684550	718500	323000
	Chilli (Arka Haritha) with precision farming package	8	1.60	36.00	19.50	84.60	720000	407500	314687	173187
	Tuberose (Arka Prajwal)	15	3.00	15.00	-	-	1050000	648000	New crop	New crop
	Mango	45	11.50	85.00	46.00	85.00	327250	202750	176200	90850
ICAR-NIANP, Bengaluru	Beans (Arka Arjun)	5	1.00	30.60	25.40	25.00	1229000	1168000	254000	219000
	Ridge gourd (Arka Prasanna)	6	4.00	67.40	62.60	9.40	137560	1364300	149000	111000
	Okra (Arka Anamika)	5	1.40	14.60	11.50	27.30	416000	421400	-	-
<b>Total</b>	<b>143</b>	<b>33.70</b>								



Chilli (Arka Haritha) with precision farming demonstration (ICAR-IIHR, Bengaluru)



Amorphophallus harvest (ICAR-CPCRI RS, Kayamkulam)

**(d) Livestock module**

Technology wise interventions implemented under livestock module by FFP institutes are presented in



Marking and tagging the animal for vaccination purpose (ICAR-IIHR, Bengaluru)



Mastitis diagnosis (ICAR-NIANP, Bengaluru)

Table 141. Data indicated that a total of 908 farmers were involved in demonstrations of improved technologies in different cluster of villages and all have obtained benefit in terms of increased yield and income.

**(e) Enterprise module**

Technology wise interventions implemented under enterprise module by FFP institutes are presented in Table 142. A total of 62 farmers were involved in demonstrations of improved technologies in 135.10 ha. Demonstration on virgin coconut oil, vermicompost production and kalpakam keraprobio production enterprises by ICAR-CPCRI RS gave annual income of ₹. 660000, ₹. 40000 and ₹. 65000, respectively. Demonstration on vegetable seedling production enterprise by ICAR-IIHR gave annual income of ₹. 360000. Milking machine as doorstep service demonstrated by ICAR- NIANP gave annual income of ₹. 84000 to each farmer.



Keraprobio, ICAR-CPCRI RS, Kayamkulam (ICAR-CPCRI, Kasaragod)



Pathiyoor eggs, ICAR-CPCRI RS, Kayamkulam (ICAR-CPCRI, Kasaragod)

**(f) Integrated Farming Systems (IFS) module**

Technology wise interventions implemented under IFS module by FFP institutes are presented in Table 143. A total of 47 farmers were involved in demonstrations of improved technologies on 23.10 ha spread over in

**Table 141: Technology wise interventions implemented under livestock and poultry module by FFP institutes**

Institute	Intervention / technology	Farmers (No.)	Unit/No./ Area	Demo	Output Local	Increase of output (%)
ICAR-CPCRI RS, Kayamkulam (ICAR-CRCRI, Kasaragod)	Cow mat for GAP in livestock units	25	75 animals	218000.00l of milk/year	178500.00 l of milk/year	21.00
	Fodder cultivation	20	9.60 ha	50.00 q/ha	10.00 q/ha	400.00
	Egg incubators for mini units (3550 birds)	5	5 units	0.71 lakh/unit	0.52 lakh/unit	36.53
	Poultry units of gramapriya, gramasree and BV 380 breeds	64	3000 birds	₹.9318/day	₹.4368/day	113.32
ICAR-IIHR, Bengaluru	Balanced Feeding with mineral mixture and animal health camp (Infertility, mastitis, mineral deficiency)	15	60 animals	Reduced the mastitis, milk fat increased from 2-2.5 to 3.5-5.0 and SNF increased upto 8.5	Quality of milk is reduced with low fat and SNF due to mastitis disease	41.70 of milk yield increased and 90.00 of the repeat breeding reduced and mastitis disorder reduced
ICAR-NIANP, Bengaluru	Animal health and fertility management	104	127 animals	One insemination to conceive	Three insemination to conceive	200.00
	Mastitis management	149	246 animals	₹.250 veterinary expenses per month per animal	₹.1500 veterinary expenses per month per animal	83.00 reduction in veterinary expenses
	Mineral nutrition	109	124 animals	10.25 l milk yield per animal	9.50 l milk yield per animal	7.80 yield increase
	Lameness management	27	54 animals	₹. 250.00 veterinary expenses per month per animal	₹.600.00 veterinary expenses per month per animal	58.30 reduction in veterinary expenses
	HACCP based quality milk production	340	456 animals	356.00 l milk yield per animal	300.00 l milk yield per animal	18.66 increase in milk yield
	Fodder production and conservation	50	79 animals with 67 acres	322.50 l milk yield per animal	300.00 l milk yield per animal	7.50 increase in milk yield
	<b>Total</b>	<b>908</b>				



Coconut + Vegetables, ICAR-CPCRI RS, Kayamkulam (ICAR-CPCRI, Kasaragod)



Coconut+Fishery, ICAR-CPCRI RS, Kayamkulam (ICAR-CPCRI, Kasaragod)

**Table 142: Technology wise interventions implemented under enterprise module by FFP institutes**

Institute	Enterprise	Intervention / technology	Area (ha)	Farmers (No.)	Income of farmer due to intervention (₹.)	Annual income of farmer before intervention (₹.)	Annual income of farmer after intervention (₹.)
ICAR-CPCRI RS, Kayamkulam (ICAR-CRCRI, Kasaragod) CPCRI Kasaragod	Virgin Coconut Oil (VCO) unit + coconut based food products + Copra dryer (Shell fired copra dryer)	Shell fired copra dryer of 500 nuts /batch Chakku rotary press- From 100 nuts - 16- 18 kg of Copra (65-70% oil)	50.00	3	55000/month	240000	660000
		Sesame Oil can also be extracted in this					
	Vermicompost production unit	Two vermi compost units	35.00	3	3333/month	Nil	40000
	Kalpapakam Keraprobio production unit	Nutrient mixture for coconut seedlings and bearing palms	50.00	1	Gross production of 1.2 tonnes (marketing ₹.100/kg)	Nil	65000
ICAR-IIHR, Bengaluru	Vegetable seedling production	Nursery for vegetable seedling production	0.10	1	Started the work from January 2020	92500	360000
ICAR-NIANP, Bengaluru	Milking machine as doorstep service	Youths identified and provided with milking machine for door step milking services	0	54	7000/month	-	84000
	<b>Total</b>		<b>135.10</b>	<b>62</b>			

**Table 143: Technology wise interventions under Integrated Farming Systems (IFS) module**

Institute	Intervention / technology	Area (ha)	Farmers (No.)	Income of farmer due to this intervention (₹.)	Annual income of farmer before intervention (₹.)	Annual income of farmer after intervention (₹.)
CPCRI RS, Kayamkulam (ICAR-CRCRI, Kasaragod) CPCRI Kasaragod	Introduction of fingerlings (Koi Anabas and Nile Tilapia) in coconut based IFS	10.00	25	85701	140976	226677
ICAR-IIHR, Bengaluru	Field Crops + French bean + Mango + Dairy Farming + Small Ruminants	0.50	3	162790	80398	162790
	Field Crops + Chilli + Mango + Dairy Farming + Small Ruminants	1.40	5	174510	92835	174510
	Field Crops + Tomato + Mango + Dairy Farming + Small Ruminants	1.20	4	249610	121898	249610
ICAR-NIANP, Bengaluru	Mixed Cropping + Livestock	10.00	10	13000	85000	130000
	<b>Total</b>	<b>23.10</b>	<b>47</b>			

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 ₹. 226677/farmer. Demonstration on field crops + frenchbean + mango + dairy farming + small ruminants, field crops + chilli + mango + dairy farming + small ruminants, and field crops + tomato + mango + dairy farming + small ruminants by ICAR-IIHR gave average annual income of ₹. 162790, ₹. 174510 and ₹. 249610, respectively. Demonstration on mixed cropping + livestock by ICAR-NIANP gave annual income of ₹. 130000 per farmer.

### (g) Capacity Development programmes

Thematic area and institute wise capacity building programmes organized under FFP are presented in Table 144. Farmers empowerment was done through organization of 73 capacity building programmes under different thematic areas related to agriculture and allied sector wherein trained 2061 farmers. Out of which more programmes were conducted on thematic area- capacity building and group dynamics (17) followed by plant protection (10), crop production (9), livestock production and management (6), natural resource management (6), women empowerment (6), entrepreneurship development (5), soil health and

fertility management (4), nutrition security (3), processing and value addition (3), farm implements (2) and production of inputs at site (2).

### (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 145. A total of 227 extension programmes were organized by FFP institutes with the participation of 1872 farmers. Out of which more programmes on advisory services (107) followed by diagnostic visits (69), method demonstrations and remaining programmes are ranged from 1 to 10.

### 3.2.12 Agriculture Technology Information Centre

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, 149895 farmers visited ATICs in the Zone for obtaining solutions related to their agricultural problems. ATICs in the Zone provided information related to various aspects of farming to 49647 farmers, both through print and electronic media. Technology products provided to 100248 farmers which includes

**Table 144: Thematic area and institute wise capacity development 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	2	87	14	25	1	19	17	131
Crop production	5	169	3	17	1	9	9	195
Entrepreneurship development	4	236	1	7	0	0	5	243
Farm implements	0	0	1	13	1	11	2	24
Livestock production and management	1	103	2	37	3	31	6	171
Natural resource management	2	90	4	58	0	0	6	148
Nutrition security	2	279	1	25	0	0	3	304
Plant protection	2	95	8	32	0	0	10	127
Processing and value addition	1	137	2	16	0	0	3	153
Production of inputs at site	2	64	0	0	0	0	2	64
Soil health and fertility management	2	95	2	23	0	0	4	118
Women empowerment	4	358	2	25	0	0	6	383
<b>Total</b>	<b>27</b>	<b>1713</b>	<b>40</b>	<b>278</b>	<b>6</b>	<b>70</b>	<b>73</b>	<b>2061</b>

**Table 145: 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	46	215	20	35	41	425	107	675
Celebration of important days	1	47	01	23	2	140	4	210
Diagnostic visits	63	136	5	25	1	41	69	202
Exhibitions	0	115	01	19	-	-	1	134
Exposure visits	0	45	02	28	-	-	2	73
Ex-trainees sammelans	2	53	-	-	-	-	2	53
Farm science clubs	1	38	-	-	-	-	1	38
Farmers' seminar/workshops	1	19	-	-	-	-	1	19
Field days	2	67	-	-	-	-	2	67
Film shows	0	0	01	17	-	-	1	17
Group discussions	2	25	8	35	-	-	10	60
Kisan ghosthies	0	0	-	-	1	19	1	19
Kisan mela	0	0	01	25	-	-	1	25
Method demonstrations	17	135	02	23	-	-	19	158
Plant/animal health camps	0	0	02	15	4	107	6	122
<b>Total</b>	<b>135</b>	<b>895</b>	<b>43</b>	<b>245</b>	<b>49</b>	<b>732</b>	<b>227</b>	<b>1872</b>

10354 q seeds of various crops, 1362130 planting materials, 16140 poultry birds and 798 q bio-products through ATICs in the Zone. The prominent technological related services provided to farmers by the ATICs in the Zone were agri-veterinary services (24926), soil and water testing (2815), kisan call center (6535) and kisan mobile advisory services (52270).

### 3.3 Technological Backstopping by Directorate of Extension

KVKs serve as a bridge between the source of technology and their stakeholders. In this process, the Directorate of Extension (DE) under various State Agricultural Universities play an important role by providing technological backstopping to the KVKs under their jurisdiction. The Directorates also play a major role in coordinating and monitoring of KVK activities. Directorates of Extension have conducted 49 workshops/meetings as well as supported KVKs in organizing world soil day, world water day, besides holding in monthly and quarterly review meetings and pre-action plan meetings. The Director of Extension and their officials also visited 43 on farm trials and 93 plots of frontline demonstrations to review and monitor the technology application process at KVKs in the respective operational areas. Further, the officials of the

Directorate of Extension undertook the technological backstopping by delivering 61 lectures, 17 TV talks, 396 radio talks and 221 news items in newspapers. Apart from the above, Director of Extension and their officials participated in 40 scientific advisory committee meetings, 62 field days, 52 workshops/seminars, 6 technology weeks and 99 training programs. In addition, they have attended 621 other programmes including interface meetings, group discussion with KVK officials, annual review meetings, farmers meets, animal health camps and krishi melas (Table 146).

**Table 146: Details of participation by Directorates of Extension**

Activities	Number
Scientific advisory committee meetings	40
Field days	62
Workshops/seminars	52
Technology week	6
Training programs	99
Other programmes	621
<b>Total</b>	<b>2385</b>

## Chapter - 4

# Research Projects

The ICAR-ATARI is undertaking research work besides KVKs coordination and monitoring. This chapter consists of the following heads :

- 4.1 Institute research projects
- 4.2 Externally funded research projects



## 4. Research Projects

### 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)
Co-Principal Investigator	: Dr.Mallikarjun B.Hanji, Chief Technical Officer
Project duration	: Three years (1April, 2018 –31 March, 2021)

#### Major achievements

Data related to the study was collected from the participants of skill training programmes organized during 2018-19 by Krishi Vigyan Kendras in Karnataka and Kerala. Data elicited from the participants attending 44 skill development programmes on 16 skill areas / job roles. In Karnataka, 538 participants from 16 districts constituted the sample, whereas in Kerala, 277 participants from nine districts were part of the study. Together, 815 participants and 44 trainers of the two states served as respondents. Following are the salient findings:

Most prominent occupational aspiration of the skill trainees was to 'start a new occupation', in both Karnataka and Kerala. 'Expanding the present profession' was the second most important occupational aspiration for Karnataka participants 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.

The aspirations differed for the participants of different skill development areas (job roles). Most important aspiration was to become self employed by 'starting a new enterprise' for 'micro irrigation technicians' 'coconut grower' and 'assistant gardener' trainees. 'Expanding the scale of present enterprise' and 'Finding a job in local areas' was the major aspiration for the 'mango growers' participants. Among the social aspirations studied, cent per cent trainees aspired to achieve 'better status in the village' (tractor operator), 'better status in the workplace' (sericulturists), 'better lifestyle to family members' (small poultry farmer) and 'acquiring new assets' (tractor operator).

The skill development enhanced the occupational aspirations of the participants. Aspiration for starting new enterprise and for expanding the current profession further got strengthened after the skill acquisition. Skill development also boosted the confidence of the participants for aspiring to 'get job in

government or recognized institute'. So was the case with most of the social aspirations. The participants of the skill development programmes expressed that the duration of the programme is a biggest constraint, which needs to be reduced. Their inability to stay /reside in the institutions for the entire duration was mainly due to farm and home commitments. Daily commuting was also bigger constraint due to distance, poor public transport facilities and cost factors.

The trainers faced several hurdles while organizing the long-duration skill development programmes. The most important was the difficulty in uploading participants' details in the website of the ASCI. The Trainers expressed difficulty in retaining the trainees for 25 days duration, as the trainees had to balance their daily committed activities as well as attending the programme. Mobilizing stipulated number of trainees was also a difficulty for the very same reason. Since many KVKs had limited boarding facilities and some KVKs did not have the required residential facilities, providing accommodation was a difficulty in many centres. The present cost norms are too inadequate and does not support the required number of exposure visits and field trips.

In order to overcome the above constraints, the trainers have suggested to reduce the training duration to about 15 days, which was also suggested by the participants. The training curriculum needs to be suitably redesigned to reduce the training duration. The ASCI has to simplify its uploading processes, which appears to be very complex at present, and heavily time and energy consuming.

RPP-III preparation is underway and the project would be completed as per the approved duration.

#### 4.1.2. Title : Effectiveness of dairy production interventions under Farmer FIRST Project

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 - Effectiveness of dairy production interventions under Farmer FIRST Project. Interview schedule has been prepared by keeping in view of objectives, variables of the study and other important aspects such as statistical analysis. The data has been collected from 240 dairy farmers (120 from FFP adopted and 120 from FFP non adopted). The collected data has been entered in excel sheet with specific codes, master table is prepared. Data analysis 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 : Five years (Jan 2019 to  
December 2023)

##### *Major achievements*

Project on Agri Based Entrepreneurship Development among Youth is being undertaken to study the aspirations of youth, perceptions of youth towards farming and agro-enterprises, performance of enterprises and constraints faced by youth in the management of agro-enterprises. Literature reviews were collected and the interview schedule is prepared by considering the variables and study objectives. Data collection is under progress.

#### 4.1.4 Approved research projects during the year.

##### **(a) Institute Research Council (IRC)**

The First Institute Research Council 2020 meeting was held during 2-3 September 2020 under the Chairmanship of Dr V.Venkatasubramanian, Director, ATARI, Bengaluru and the following project proposals were discussed and approved:

- Analysis of Integrated Farming Systems in different agro-climatic situations in the state of Karnataka for need based Technology Application and Capacity Development proposed by Dr. D.V. Srinivasa Reddy, Principal Scientist.
- Identification and development of farm leaders through KVKs for up-scaling agricultural technologies in Karnataka, Kerala and Lakshadweep proposed by Dr BT Rayudu, Principal Scientist as PI.
- Digitization of knowledge system management for strengthening technological interventions of KVKs in Karnataka, Kerala and Lakshadweep proposed by Dr .B.T. Rayudu, Principal Scientist as PI.
- Coordination and monitoring the activities of ICAR-ATARI pertaining to KVKs in Karnataka, Kerala and Lakshadweep proposed by Dr.B.T. Rayudu, Principal Scientist as PI..
- Assessment of technological and capacity needs perceived by dairy farmers and extension functionaries in northern Karnataka proposed by Dr.D.V.Kolekar, Scientist as PI.

- Impact assessment of technological interventions implemented by KVKs of Karnataka, Kerala and Lakshadweep proposed by Dr.K.Thimmappa, Pincipal Scientist as PI.

##### **(b) Research Advisory Committee (RAC)**

Series of meetings of RAC were held under the Chairmanship of Dr.P.Das, Former, Deputy Director General (Agricultural Extension), ICAR and formulated eight network projects of which ICAR-ATARI Scientists are involed in the following six projects:

- National Innovations on Climate Resilient Agriculture (NICRA)
- Assessing dietary diversity, consumption pattern and nutritional security in Nutri-SMART villages- a step towards vocal for local.
- Doubling the Farmers Income (DFI) in KVK Cluster villages.
- Analysis of agricultural programmes conducted in aspirational districts in India.
- Impact of ARYA on promotion of agri-preneurship and alternative livelihoods.
- Impact assessment of popular pulses varieties and technologies disseminated by KVKs through Cluster Frontline Demonstration of pulses (CFLD-P) in India.

#### 4.2 Externally funded research projects

##### **4.2.1 Network project on New Extension Methodologies and Approaches (NEMA)**

Principal Investigator : Dr.D.V. Kolekar  
(Collaborating Center)

Project duration : Two-year, two month  
(February, 2019 –  
March, 2021)

##### *Major achievements*

This project is funded by Division of Agricultural Extension, ICAR, New Delhi involving cost of ₹. 263.97 lakh (₹. 14.65 lakh for ICAR-ATARI Bengaluru) and being implemented through 19 ICAR research institutes on network mode. 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. The data has been collected from 450 farmers belonging to five districts of Karnataka viz. Mysore, Ramanagara, Shivamogga, Davanagere and Gadag each with 90 farmers (60 adopted and 30 non adopted farmers). The collected data handed over to collaborating partner ICAR-IIHR Bengaluru for further processing as per guidelines.

## Chapter - 5

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# Publications

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Publications of Scientists of ICAR-ATARI as well as KVKs of the Zone XI are presented broadly under the categories such as research articles, papers / abstracts presented in international / national conferences, books, book chapters and reports during the period under report.



## 5. Publications

### 5.1 Research articles

Chandre Gowda M.J., Rajendra Hegde, and D.V.Srivinasa Reddy, 2020. Effectiveness of training on land resource inventory in terms of knowledge, satisfaction, willingness to adopt and interest in future training. *The Mysore Journal of Agricultural Sciences*, **54** (4): 31-36.

Thimmappa K., T. Damodaran and R. Raju, 2020. Impact of Bio-growth Enhancer Adoption on Input Use and Profitability in Salt-affected Smallholder Farms. *Journal of Soil Salinity and Water Quality*, 12(1): 121-126.

Raju R., Ranjay K. Singh and Thimmappa K. 2020. Human Resource Development and Sustainable Management of Agricultural Land Resources in Sodic Environment of Uttar Pradesh. *Journal of Soil Salinity and Water Quality*, 12(2): 290-296

### 5.2 Papers presented in International/ National conferences

Chandre Gowda M.J. and Shrishail S. Dolli, 2020. Agrarian Crisis: The role of extension as an enabling system of decision making by farmers, Paper presented in the Indian Science Congress, University of Agricultural Sciences, Bengaluru.3-7, January 2020.

### 5.3 Book/ chapters

Chandre Gowda M.J., Arun Balamatti, Philip H. Puthira Prathap D. and Saju George, 2020. Agricultural Extension for Sustainable Development. Samvahana Publishers, Mysuru, Pp.224 ISBN : 978 - 81 - 9393357 - 5-3.

Chandre Gowda M.J., 2020. Kharif Advisories to farmers of Karnataka (Kannada) p270-278 and Kerala (Malayalam) p279-284 in: Kharif Agro Advisories for Farmers, Indian Council of Agricultural Research, Agricultural Extension Division, New Delhi. p286 <https://icar.org.in/content/advisories-during-covid-19-pandemic>

Chandre Gowda M.J., 2020. Innovative Agri Solutions during COVID-19. Indian Council of Agricultural Research, Agricultural Extension Division, New Delhi. <https://icar.org.in/content/advisories-during-covid-19-pandemic>

Chandre Gowda M.J., 2020. Zone XI. COVID 19 advisories and guidelines to farmers of Karnataka (Kannada) p129-130 and Kerala (Malayalam) p132-134 In : ICAR Initiatives during COVID 19 pandemic, 2020 Indian Council of Agricultural Research, Agricultural Extension Division, New Delhi. <https://icar.org.in/content/advisories-during-covid-19-pandemic>

Chandre Gowda M.J. and Arun Balamatti, 2020. Introduction *In: Agricultural Extension for Sustainable Development* Eds: Chandre Gowda M. J., Arun Balamatti, Philip H., Puthira Prathap D. and Saju George, Samvahana Publications, Mysuru ISBN 978-81-938357-5-3, 1-6.

Nagaraja N.Manjula and Chandre Gowda M.J. 2020. Solomon Four-Group Research Design: An appropriate design for social science research, *In: Agricultural Extension for Sustainable Development* Eds: Chandre Gowda M. J., Arun Balamatti, Philip H., Puthira Prathap D. and Saju George, Samvahana Publications, Mysuru, ISBN 978-81-938357-5-3, 56-61.

Kolekar D.V. and Chandre Gowda M. J. 2020. Livelihood and Nutrition Support from Dairy Farming in Southern Karnataka, *In: Agricultural Extension for Sustainable Development* Eds: Chandre Gowda M. J., Arun Balamatti, Philip H., Puthira Prathap D. and Saju George, Samvahana Publications, Mysuru, ISBN 978-81-938357-5-3, p153-160.

### 5.4 Reports

Annual Report 2019, ICAR Agricultural Technology Application Research Institute (ATARI), (Eds: M.J.Chandre Gowda, D.V.Srinivasa Reddy, B.T.Rayudu, K.Thimmappa, D.V.Kolekar, Mallikarjun B Hanji), ICAR Agricultural Technology Application and Research Institute, Zone XI, Bengaluru, India, 175p.

Prathap D Puthira, Murali. P and Venkatasubramanian. V. 2020 Compendium of Reasearch articles and Status papers pf 51st Sugarcane R & D workshop of Tamil Nadu and Puducherry. (ISSN-0973-8185).

### 5.5 Publications by KVKs

KVKs of Karnataka published 234 research papers/abstracts, 121 technical reports, 162 technical bulletins, 312 popular articles and 305 extension literature, KVKs of Kerala published 26 research papers/abstracts, 16 technical reports, eight technical bulletins, 91 popular articles and 101 extension literature, and KVK Lakshadweep published three popular articles on various technological aspects of agriculture and its allied enterprise. The details are given below:

### 5.5.1 Research papers/ abstracts

- A. Ravikumar, B. V. Shreenivas and Raghavendra, 2020. Impact of Varied Groups of Organics at Different Levels Supplied to Mulberry on Pupal and Egg Traits of Silkworm. *Int.J.Curr.Microbiol.App.Sci.* 9(1):925-927.
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Fig value addition unit promoted (KVK Ballari)

### 5.5.3 Technical bulletins

Technical Bulletin	Printed
A handbook on technologies suitable for kodagu district for daesi 2 <sup>nd</sup> batch students	40
Apiculture	500
Balanced diet	500
Belagavi jilleya pramukh belegal noothan besaya tantradnanagalu	500
Hattiya pramukh keetgalu mattu samgranirvahana kramagalu	500
Innovative agri-solutions during covid-19 (e-book)	1000
Kadale hagu surya kanthi beleya sudharita besaya kramagalu	100
Krishi vigyan kendra, vijayapur: an overview	500
Krishi vigyan patrike	250
Krishiyalli peedenshakgal surkshith balake	500
Labhadayaka hainugarikeya tantragynanagalu	1000
Mane angala: oushadiya aagara	1000
Millets in daily diet	500
Mushroom cultivation	1000
Nursery management	500
Organic farming	500
Peedenirvhaneyalli sasya janya keetnashakagalu	500
Pest control measures in pulses	500
Pests of horticultural crops	500
Plant protection in horticulture crops	500
Plant protection in oilseeds	500
Plant protection in pulses	500
Plant protection measures in pulses	500
Redgram cultivation practices	500
Sasya samrskshneyalli jaiveek peedenashakagal mahatva	500
Siridhanaya belesi, aarogya vrudhisi	1000
Siridhanya sudharith besaya kramagalu, mahthva hagu moulya vardhane	1000
Soil & water testing	500
Suitable perennial crops of kalaburagi district	500
Terrace gardening	500
Use of safety kits and its advantages	500
Value added products of ragi	1000
Vermicomposting	500
Watermelon cultivation practices	500
Weather advisory bulletin of damu	200
Weed management	500

### 5.5.4 Extension literature

Title	Month-Year	printed
Aahaara bhadrategaagi poushtika kaitotada nirvahane	2020	1000
Aahar badrategagi poustic kaitota. KVK, Bagalakote.	Sep-20	500
Adike beleya samagra krishi paddathigalu	Aug-20	50
Amur & common carp culture	Mar-20	500
Anabe krishi	2020	1000
Anabe krishi	2020	500
Angayyalli krushi havamana.	2020	1000
Annadatana Seveyalli Hanumanamattiya karnataka pratama krushi vigyan kendra	2020	500
Apoustikathe nivarisalu jeeva vaividhyakarisisida thaligalu	2020	500
Aquaponics	2020	500
Azolla- boon for organic farmers	Mar-20	500
Azolla –Poustikathe mathu Upayoga	2020	500
Azolla utpaadana taantrikategalu	2020	1000
Azolla. krishi vinjana pathrika of KVK (Ernakulam)	2020	1000
Azolla-saavayava krishikarige varadhana	Mar-20	500
Bale grand nine beleyalli nikhara bhesaya	2020	500
Battada beleyalli ele banna phalakada upayoga	2020	500
Battadalli samagra keeta nirvahane	2020	500
Battadhalli savayava krisi	2020	400
Bee keeping	2020	20
Belegalali neerina bedike, niravari antara mathu neeru kodabekada hantagalu	2020	500
Berala tudiyalli havamana maahiti, kaiyalli smart phone iddare saaku.	2020	3000
Bhattadalli kale niyantrana	Jun-20	1000
Bojjun nirvahane	2020	500
BT hattiyalli samagra keeta nirvahane	2020	500
Butter fruit	2020	100
Characteristics of kadaknath breed	2020	50
Clean milk production	May-20	500
Composite fish culture	Nov-20	500
Composite fish culture	Mar-20	500
Conventional fodder resources	Mar-20	1000
Covid-19 kaladhalli ahara salahe mathu roga nirodhaka shakthi(UASR/PC/LL-23/2020-21)	2020	200
Cultivation methods of sweet potato	2020	1000
Cultivation of ylang- yalng in betta lands of Uttara Kannada district	Aug-20	500
Cultivation of fruit crops suitable for dry land horticulture	Dec-20	500
Dalimbe besaya	2020	500
Damini App	Nov-20	500
Decomposition of areca husk for value added compost	2020	1000
Desert locust	2020	500

Desert locust for warning and its management	2020	1000
Dry land horticulture	Mar-20	1000
Dwidala mevina belegalu mathu sudharitha besaya kramagalu	2020	500
Earthworms cultivation	Dec-20	500
Eco friendly pest and disease management in paddy	Mar-20	500
EM solution for manure production from bio-wastes.	2020	2000
Farm mechanization in paddy-A boon to paddy growers	Mar-20	500
Field bean cultivation practices	2020	500
Fodder production and utilization	Mar-20	500
Folder on CHES, chettalli technologies	2020	500
Folder on scientific cross bred calf management for profitable dairying	2020	1000
Folder- value addition to mushroom	2020	500
Folder-mushroom cultivation	2020	500
Getting good quality crop with the production and use of organic inputs	Dec-20	250
Giant african snail management	Feb-20	100
Giriraja koli sakanike	2020	500
Godambi beleyalli aadhunika besaaya kramagalu haagu samagra peede nirvahane	2020	1000
Godi bele samagra nirvahane	Mar-20	500
Gulaabi beleyalli aadhunika besaaya kramagalu haagu samagra peede nirvahane	2020	1000
Hani niravari padhati: pramukyathe vinyasa mathu nirvahane	2020	500
Hatti beleya noothan besaya tantradnanagalu	Mar-20	500
Hatti beleyalli samagra bele nirvahane	2020	500
Havaamaana krishi: apps and programmes	Apr-20	50
Havamana aadharitha krishigagi mobile app galu	2020	500
Hesaru bele samagra bele nirvahane	Mar-20	500
Hippunerale yele suruli keetada samagra nirvahane	2020	1000
Hippuneraleyalli thrips nusiya samagra niyantrana	2020	1000
Hunase hannina moulyavardhane	2020	1000
Hunase hannina mouyavardhane	2020	1000
ICM in pulses	Mar-20	500
ICT in agriculture	Dec-20	150
Importance of soil testing	Mar-20	500
Importance of balanced diet	Feb-20	500
Importance of bio-fertilizers and their usage	Dec-20	250
Importance of nutritional diet for enhancing immunity of human	May-20	40
Important dairy breeds and their selection	2020	500
Improved agronomic practices in wheat	Dec-20	1000
Improved cultivation practices in coconut	2020	40
Improved cultivation practices in ridgegourd	Apr-20	250

Improved method of pig rearing	Mar-20	500
Improved production technology in paddy cultivation	Mar-20	500
Inchiyude sasthanriya vasangal	2020	500
Indhana vulisaaadaya hecchisi	2020	500
Integrated crop management in French bean	2020	500
Integrated crop management in redgram	2020	500
Integrated crop management in tomato	2020	500
Integrated fish cum poultry farming	2020	100
Integrated nutrient management in banana.	2020	2000
Integrated pest and disease management in papaya	Mar.20	500
IPM in FAW in maize	2020	20
Januvarugala samanya rogagalige paramparika ousadhi	Aug-20	50
Jilla krishi havamana ghatakada krishi salahe mattu sevegalu	2020	500
Kaada valarthal	2020	500
Kadale bele samagra nirvhane	Mar-20	500
Kadime karchinalli shenga utpadana kramagalu	2020	500
Kakada huvina bele: sudharitha besaya kramagalu	2020	500
Kalparuksha	2020	25
Kari menasina samagra besaya paddathi	Aug-20	50
Kari nilangalile nelkrishi	2020	500
Karugalu mathu paddegala palane	2020	500
Keedanashinikalute surakshitha upayogam (Safety measures in usage of insecticides)	2020	500
Kolave baavigala marupoorana	2020	500
Kolave bavigala antarjala punaschetana	2020	500
Koonkrishi – labhakaramaaya samrambham	2020	500
Krishi aadharitha mobile app gala parichaya	2020	500
Krishi mobile application: arivu mathe balake	2020	500
Krishi vigyan kendra-kisanonki pragati mei sahayak(In Hindi )	Mar-20	100
Krishihondadha pramukyathe vinyasa mathu neerina sadhbalake	2020	500
Krishiyalli hasirele gobbaragala balake	2020	500
Krishiyalli jaivika gobbarada balake	2020	500
Kuri sakanike ondu labhadayaka udyama	2020	500
Kurigala ahara paddati	2020	500
Kuttikkurumulaku paripalanam- leaflet	2020	2000
Kutumbada ahara bhadrategagi kaitota	2020	1000
KVK e news letter	Monthly	E-mail
KVK newsletter	Monthly	100
Labhadayaka krishige pramukha amshgalu	2020	500
Labhadayaka menu krushi	2020	500
Leaf folder management in mulberry	2020	500

Location specific weather forecast and weather based agro advisories	2020	500
Lumpy skin disease	2020	500
Maavina hannina poustikathe mathu moulyavardhane	2020	500
Maavu: samagra bele nirvahane	2020	500
Madhura kizhangu athijeevanathinu	2020	1000
Management of fall armyworm through integrated approach	2020	25
Manegondhu kai tota	Aug-20	50
Mannina phalavatathe hechisalu savayava gobbaragalu	2020	500
Mannu pareekshe mattu adara pramukhyate.	2020	1000
Mannu pariksheya mahatva- mannu madhari sangrahisuva vidhana	2020	1000
Maracheenyil micorizha upayogichulla samyojitha valapreyogam	2020	500
Meghadoot - boon to farmer	2020	500
Meke sakanike: ondu labadhayaka kasubu	2020	500
Mekkejoladalli kandu banda hosa keeta fall sainika hulu (Spodoptera frugiperda) : parichaya hagoo nirvahane	Aug-20	50
Mevu bele sangrahane	2020	500
Mighty millets 2020	Apr-20	50
Millets processing & value addition	Sep-20	500
Multipurpose aquatic plant	2020	40
Musikina joladalli beleyalli kale niyantrana	Jun-20	1000
Musukina joga/jolada belegalalli ele suli sainika huluvinu hosa prabedha (Spodoptera frugiperda) nirvahana karmagalu	2020	500
Mycorrhiza.	2020	1000
Nelagadaleyalli samagra bele nirvahane	2020	500
Nimbeya moulyavardhane	2020	500
Nursery management	Sep-20	500
Nutri garden	May-20	130
Nutri garden: Importance and its management	Mar-20	1000
Ornamental fish cultivation	2020	25
Paaval krishi	2020	500
Pachaka ennakalude upayogakramam	2020	1000
Pachakkarikalilum ottuthaikal	2000	1000
Paired row planting in paddy	2020	500
Papaya besaya ICAR-IIHR mobile app balake	2020	500
Pest and disease management in arecanut	Mar-20	500
Pest and disease management in arecanut	Mar-20	500
Pest and disease management in banana	Feb-20	500
Pest and disease management in cashew	Mar-20	500
Pest and disease management in pepper	Mar-20	500
Plant nutrient deficiencies and their management in coffee	2020	500

Poshaka surakshaykk nithyavum ilakkarikal	2020	1000
Poultry farming	2020	500
Production and management of cashew grafts	Apr-20	100
Production technologies of fodder crops	Dec-20	250
Production technology of arecanut	May-20	500
Production technology of banana	May-20	500
Production technology of cashew	May-20	500
Production technology of cocoa	May-20	500
Production technology of coconut	May-20	500
Production technology of jack	May-20	500
Production technology of organic manure	Mar-20	500
Production technology of pepper	May-20	500
Production technology of udupi jasmine	May-20	500
Pseudomonas fluorescens: vilakalile supradhana jaivaroganiyanthrana upadhi	2020	500
Ragi beleya nuthana taligalu mathu sudharitha tantrajana	2020	500
Raita snehi yere hulu gobbara tayaarika vidhaana haagu gunadharmagalu	2020	1000
Raitarige mobile app aadharita sevegalu	2020	500
Raitharige krishi havamana mahiti talupisuva meghadoot app	2020	500
Rasamevu: poustika melevina bank	2020	500
Red palm weevil management in plantation crops	Feb-20	500
Reshme hulu saakaanikeyalli oojinonada samagra nirvane	2020	1000
Role of iron in human health	Dec-20	100
Role of trichoderma in pest and disease management	Mar-20	500
Rugose spiraling whitefly in coconut	2020	500
Safety measures during pesticides spray	Jun-20	500
Sahyadri panchamukhi paddy variety for flood affected areas of Dakshina Kannada	Mar-20	500
Samagra krishi padathi: susthirathe mattu aahara bhadrate	2020	500
Samagra krishi paddati: Susthira aadaayakkondu daari	2020	1000
Scientific pig farming	May-20	500
Scientific goat farming	May-20	500
Scientific poultry farming	Feb-20	500
Scientific production technologies of marigold flowers	Mar-20	500
Selection of cattle breeds	May-20	500
Shenga beleyalli samagra bele nirvahane	2020	500
Shivani –a potential MPTs	Nov,20	500
Shudha haghu gunamattada halu uthpadane-suthragalu	2020	500
Shunti beleya utpadane tantrikategalu	2020	500
Sidilige damani kode.	2020	1000
Siridhanya poustikathe mathu upavoga	2020	500

Soil and water conservation and backyard poultry farming	Mar-20	500
Soil and water conservation measures	Dec-20	500
Soil health management through organic fertiliser	Dec-20	500
Soil test based nutrient management approaches in direct seeded rice	Dec-20	500
Soragu mathu banje roga nirodhaka togari tali BRG-3	2020	500
Soya avare beleyalli samgrag pide nirvahane/ KVK, Bagalakote,	Sep-20	500
Soyaware samgra bele nirvahane	Mar-20	500
sudharith beesaya kramagalu	2020	500
Sudharith mevin belegalu	2020	500
Sudharitha godambi besaya	2020	500
Tengu: samagra poshakamsha mathu peede nirvahane	2020	500
Tengubeleyalli rugose spiraling bili nona nirvahane	2020	500
Tilapia menu sakanike : ondu aadhayotpanna chatuvatike	2020	500
Togari beleyalli samgrag pide nirvahane KVK, Bagalakote	Sep-20	500
Togariyalli beleyalli roga mathu kita nirvahane	2020	500
Togariyalli samagra bele nirvahane	2020	500
Tomato beleyalli sudharitha adhunika besaya tantrikathegalu	2020	500
Training manual on integrated animal husbandry practices for profitable dairy farming	2020	25
Training manual on scientific sheep and goat farming	2020	20
Training manual on sheep and goat farming a sustainable income	2020	20
Transplanted method in pigeonpea cultivation	2020	500
Trichoderma enriched coir pith compost,	2020	1000
Use of green manure for increasing soil fertility	Dec-20	1000
Vaazha krishiyile varumana vardhanavinulla sankethika vidyakal	2020	500
Value added products of foxtail millet and brown top millet	Apr-20	1000
Value addition in mushroom	Dec-20	40
Vegetable special	2020	200
Vermi compost production technologies	Mar-20	500
Vermi composting for organic farming	2020	1000
Vermicompost	2020	40
Vermicompost production technology	Mar-20	500
Vila samridhikk shasthreeya mannu parishodhana	2020	1000
Vilakalile valaprayogam sredhikkenda karyangal	2020	1000
Vivida pramuka belegalhalli rasagobbarada balake	2020	500
Wick irrigation	2020	50
Ye annaga, attyavashyaka ssokshma poshakamsha	2020	1000
Yellow leaf disease of arecanut	Feb-20	100

## Chapter - 6

# Workshops Meetings Conferences Human Resources Development

Director/scientists/officers of the institute were conducted/participated in 152 workshops/ meetings/ conferences as well as human resources development.



## 6. Workshops, Meetings, Conferences and Human Resources Development

Director/ scientists/ officers of the institute conducted /participated in the following workshops/ meetings/ conferences held during the reporting period:

### Dr.V. Venkatasubramanian, Director

- Interaction cum review meeting of KVK, Kolar on 04 August, 2020.
- Webinar on Launch of “Krishi Megh” (NARES-Cloud Infrastructure and Services) organised by Director (A), ICAR- IASRI, Delhi on 11 August, 2020.
- Interaction cum review meetings of KVK, Chamarajanagar, Mysuru (12.08.2020) and KVK, Mandya (13.08.2020).
- Interaction cum discussion meeting organized by UAS, Dharwad on 16.08.2020 and inauguration programme of administrative building at KVK, Uttara Kannada on 17.8.2020.
- Interaction cum review meetings of KVKs viz., Uttara Kannada and Dharwad (17.08.2020); Belagavi-I and Belagavi-II (18.08.2020); and Gadag, Haveri and Davanagere (19.08.2020).
- Interaction cum review meeting of KVK, Tumakuru-II on 21 August, 2020.
- Interaction cum review meeting of KVK, Bengaluru Rural on 25 August, 2020.
- Webinar on 30<sup>th</sup> meeting of the Board of Governing Council (Directors) of Agriculture Skill Council of India (ASCI) organized by DGM-Finance, ASCI on 01 September, 2020.
- Visited ICAR-Sugarcane Breeding Institute (SBI), Coimbatore during 07-08 September, 2020.
- Webinar on Gandhian Philosophy in the backdrop of Agricultural Transformation by Dr. J.Venkata Pirabu, Director, Directorate of Planning & Monitoring, TNAU, Coimbatore organised by Director, SBI, Coimbatore on 30 September, 2020.
- Virtual RAC meeting of ICAR-ATARI Hyderabad and Bengaluru on 01 October, 2020.
- Interaction cum review meeting of KVK, Ramanagara on 07 October, 2020.
- Webinar on Meeting with Progressive Farmers and Experts in connection with Agri Start-up Policy in Karnataka organised by VC, UAS, Dharwad on 15 October, 2020.
- Webinar on 60<sup>th</sup> meeting of Expert Committee to Access and Benefit Sharing organised by Secretary, NBA, Coimbatore on 21 October, 2020.
- Chief Guest at Krishi Mela organized by University of Agricultural Sciences (UAS), Bengaluru on 11 November, 2020.
- Virtual meeting on Third Party Evaluation organized by DDG (AE), ICAR, New Delhi on 12 November, 2020.
- Virtual discussion meeting with KVKs of ICAR-ATARI, Bengaluru on submission of proposal for food processing and value addition on 19 November, 2020.
- Virtual additional Special RAC meeting for finalization and approval of research proposals organized by ICAR-ATARI, Umiam on 21 November, 2020.
- Virtual meeting, ASCI, Governing Council & Board of Directors on 24 November, 2020.
- Convocation function of University of Agricultural Sciences (UAS), Bengaluru on 28 November, 2020.
- Scientific Advisory Committee (SAC) meeting of KVK, Kodagu on 04 December, 2020.
- Webinar on promotion of Soybean in Zone XI KVKs in association with NRC Soybean on 08 December, 2020.
- Chaired Local Management Committee Meeting of BBT Project at ICAR-CIAE, Coimbatore on 11 December, 2020
- Interaction cum review meeting of KVK, Shivamogga on 13 December, 2020.
- Scientific Advisory Committee (SAC) meeting of KVK, Udupi on 14 December, 2020.
- Scientific Advisory Committee (SAC) meeting of KVK, Chikkamagaluru on 15 December, 2020.

- Scientific Advisory Committee (SAC) meeting of KVK, Chitradurga on 16 December, 2020.
- Chaired Local Programme Advisory Committee (LPAC) meeting of DST Project Women Friendly Farm Mechanization package in Tribal areas of Tamil Nadu at Seminar Hall, CIAE-RC, Coimbatore on 11 December, 2020.
- Chaired Technical Session IVc: Review meeting of SCSP activities organized by Director, ICAR-IIFSR, Modipuram on 16 December, 2020.
- Scientific Advisory Committee (SAC) meeting of KVK, Hassan on 28 December, 2020.
- Virtual Meetings of all KVKs on Nutri-garden Review and Action plan for 2020-21 during 25-26 June, 2020.
- Virtual Scientific Advisory Committee (SAC) meeting of KVK, Yadgir on 14 September, 2020.
- Virtual Scientific Advisory Committee (SAC) meetings of KVK, Kalaburgi-I and Kalaburgi-II on 15 September, 2020.
- Virtual Scientific Advisory Committee (SAC) meeting of KVK, Koppal on 21 September, 2020.

**Dr.M.J. Chandre Gowda, Principal Scientist (Agricultural Extension) and Director (Acting upto 22.07.2020)**

- As Chairman of the Local Organizing Committee, coordinated the Farmers Science Congress on 6 January, 2020 as part of the Indian Science Congress organized at GKVK, UAS Bengaluru (03-07 January 2020). Dr. Trilochan Mohapatra Secretary DARE & DG ICAR, inaugurated the Farmers Science Congress, which was first of its kind in the history of Indian Science Congress.
- Virtual Meeting of all KVKs on COVID guidelines on 11 April, 2020.
- As Director (Acting) conducted five Annual Review-cum-planning workshops for the KVKs under the jurisdiction of DEs of UAS, Bengaluru during 20-21 May, 2020; UAS, Dharwad during 27-28 May, 2020; UAHS, Shivamogga on May 2020; UAS, Raichur during 01-02 June, 2020 and Annual Review Workshop of Kerala KVKs during 14-15 July, 2020.
- Virtual meetings with State Governments of Karnataka and Kerala on 08 June, 2020.
- Seven online meetings of KVKs on Zonal Review of NFSM Pulses and Oilseeds (10.06.2020), Zonal Review of Farmer FIRST (11.06.2020), National Review of NICRA (12.06.2020), National Review of ARYA (16.06.2020), National Review of Farmer FIRST (17-18 June 2020), Local Review of NEMA (22.06.2020) and Zonal Review of NICRA (29.06.2020).
- As Member Secretary of RAC, coordinated eight RAC meetings; ICAR-ATARIs Bengaluru and Hyderabad on 01 October, 2020; ICAR- ATARIs Umiam and Guwahati on 07 October, 2020; ICAR- ATARIs Jabalpur and Pune on 12 October, 2020; ICAR- ATARIs Jodhpur and Kanpur on 15 October, 2020; ICAR- ATARI Ludhiana on 16 October, 2020; ICAR-ATARIs Kolkata and Patna on 21 October, 2020; first special meeting of RAC during 06-07 November, 2020 and second special meeting of RAC on 21 November, 2020.
- As Nominated Expert participated in 31 Extension Education Council Meeting.
- Guwahati on 07 October, 2020; ICAR- ATARIs Jabalpur and Pune on 12 October, 2020; ICAR- ATARIs Jodhpur and Kanpur on 15 October, 2020; ICAR- ATARI Ludhiana on 16 October, 2020; ICAR-ATARIs Kolkata and Patna on 21 October, 2020; first special meeting of RAC during 06-07 November, 2020 and second special meeting of RAC on 21 November, 2020.
- As PI, Chaired and conducted four team meetings of National Network Research Project on 22 October, 2020; 28 October, 2020; 27 November, 2020; and 15 December, 2020.
- As a Member of Steering and Monitoring Committee, participated in DBT Programme on 09 November, 2020.
- Scientific Advisory Committee (SAC) meeting of KVK, Mallapuram on 26 November, 2020.

- Virtual Scientific Advisory Committee (SAC) meeting of KVK, Palakkad on 18 December, 2020.
- As Nodal Officer, virtual review meeting was conducted for KVKs on 18 December, 2020.

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

- Annual Action Plan workshop for the KVKs of Kerala and Lakshadweep through video conferencing during 14-18 May, 2020.
- Annual Action Plan workshop for the UAS-B KVKs at GKVK, Bengaluru during 20-21 May, 2020.
- Virtual interaction meeting for the Phase-II of NICRA with the CRIDA and DDG, NRM on 12 June, 2020.
- Interaction meeting of Hon'ble Agriculture Minister, Government of Karnataka at ATARI, Bengaluru on 13 June, 2020.
- Attended as an expert for interviewing of candidates for the post of SMS (Agro met) in virtual mode for KVK Yadgir under DAMU on 08 December, 2020.
- NICRA-Annual Review cum Work Plan finalization Workshop with the ICAR-CRIDA, Hyderabad and NICRA KVKs of Zone-XI via Video conferencing on 29 June, 2020.
- Zonal Annual Review workshop of ATARI, Bengaluru through Video Conferencing during 14-15 July, 2020.
- Visited KVK Kolar along with the Director, ATARI, Bengaluru for technical guidance and KVK administrative building construction status with the Hon'ble VC and other key officers of UHS, Bagalakote on 04 August, 2020.
- First IRC of ATARI, Bengaluru at ATARI, Bengaluru during 02-03 September, 2020.
- Virtual National level ACZ conference conducted by Agriculture Commissioner, GOI in respect of Zone-VI-Southern Plateau and Hills and presented the status report from ATARI, Bengaluru on 09 September, 2020.

- Attended and reviewed the DAMU progress of DAMU KVKs under ATARI, Bengaluru along with the IMD officials on 15 September, 2020.
- Attended as an expert for interviewing of candidates for the post of SMS (Agro met) at KVK Haveri under DAMU on 22 September, 2020 in virtual mode.
- Attended as an expert for interviewing of candidates for the post of SMS (Agro met) at UAS, GKVK, Bengaluru for three KVKs of Phase-II under DAMU on 14 October, 2020.
- Attended the SAC meeting of KVK Haveri in virtual mode on 05 November, 2020.
- Attended the SAC meeting of KVK Uttar Kannada in virtual mode on 07 November, 2020.
- Attended the SAC meeting of KVK Bagalakote in virtual mode on 13 November, 2020.
- Attended as an expert for interviewing of candidates for the post of SMS (Agro met) at KVK Dakshin Kannada under DAMU on 10 December, 2020.
- Attended the SAC meeting of KVK Chitradurga in virtual mode on 16 December, 2020.
- Attended and chaired the technical session IV: Review of Scheduled caste sub plan (SCSP) activities under AICRP FSR Modipuram-Biennial workshop on virtual mode and reviewed the work of 11 centres of FSR in the country on 16 December, 2020.

**Dr.B.T.Rayudu, Principal Scientist (Agricultural Extension)**

- QRT meeting for the KVKs under the jurisdiction of UAS, Dharwad and UAHS, Shivamogga at UAS, Dharwad campus during 9-11 January, 2020.
- Meeting of Research Advisory Committee (RAC) constituted for all the 11 ATARIs at NASC Complex, New Delhi during 31 January - 01 February, 2020.
- QRT meeting for the KVKs under ANGRAU, Guntur, Andhra Pradesh (second phase) at KVK, Chittoor (RASS) during 3-6 February, 2020.

- Scientific Advisory Committee (SAC) meeting of KVK, Gadag on 07 March, 2020.
- Virtual Review (2019)-cum-Action Plan (2020-21) workshop for the KVKs under the jurisdiction of Director of Extension, UAS, Dharwad during 27-28 May, 2020.
- Virtual Action Plan workshop for the year 2020-21 for the year 2019 for the KVKs under the jurisdiction of Director of Extension, UAHS, Shivamogga on 03 June, 2020
- Virtual Review (2019)-cum-Action Plan (2020-21) workshop for the KVKs under the jurisdiction of Director of Extension, UAS, Raichur during 01-02 June, 2020.
- Virtual Review workshop for the year 2019 for the KVKs under the jurisdiction of Director of Extension, UAHS, Shivamogga on 03 June, 2020
- Zonal Review (2019) cum action plan (2020-21) of CFLDs on Pulses and Oilseeds under NFSM on 10 June, 2020.
- Interaction meeting of Hon'ble Agriculture Minister, Government of Karnataka with KVKs of Karnataka at ICAR-ATARI, Bengaluru on 13 June, 2020.
- Virtual Zonal Annual Review workshop of KVKs of ICAR-ATARI, Bengaluru through during 14-15 July, 2020.
- First IRC of ATARI, Bengaluru at its Conference during 02-03 September, 2020.
- Virtual meeting of QRT for KVKs in Tamil Nadu and Puducherry hosted by ICAR-ATARI, Hyderabad during 12-14 August, 2020.
- Virtual First Research Advisory Council (RAC) meeting of ICAR-ATARI, Bengaluru on 01 October, 2020.
- Virtual meeting on Awareness on Farmers Act and Outreach Programme for KVK farmers by Hon'ble Minister of Agriculture (MoS) organized by DAC & FW, New Delhi on 08 October, 2020.
- Virtual meeting on review of CFLDs on pulses for kharif 2020-21 organized by DAC & FW, New Delhi on 14 October, 2020.
- Virtual meeting of QRT for KVKs in Kerala and Lakshadweep hosted by Directorate of Extension, KAU, Thrissur during 22-23 October, 2020
- Virtual Scientific Advisory Committee (SAC) meeting of KVK, Raichur on 14 September, 2020
- Virtual meeting of network project on Aspirational districts on 02 November, 2020.
- Meeting of Chairmen of two Committees on strengthening of KVKs in Karnataka and Kerala at ICAR-ATARI, Bengaluru on 03 November, 2020.
- Virtual Sensitization workshop for KVKs on strengthening interventions and documentation of achievements on 05 November, 2020.
- Virtual special meeting of RAC of 11 ATARIs during 6-7 November, 2020.
- Virtual meeting with Committee on strengthening the KVKs in Karnataka on 10 November, 2020.
- Virtual meeting on third party evaluation on 12 November, 2020.
- Virtual Scientific Advisory Committee (SAC) meeting of KVK, Belagavi-II on 04 November, 2020
- Virtual Scientific Advisory Committee (SAC) meeting of KVK, Dharwad on 09 November, 2020
- Virtual meeting with KVKs in Zone-XI on 9 December, 2020.
- Scientific Advisory Committee (SAC) meeting of KVK, Chikkamagaluru on 15 December, 2020.
- Scientific Advisory Committee (SAC) meeting of KVK, Chitradurga on 16 December, 2020.
- Virtual Scientific Advisory Committee (SAC) meeting of KVK, Shivamogga on 17 December, 2020.

- Meeting with QRT member at ICAR-ATARI, Bengaluru during 17-18 December, 2020.
- Virtual meeting on National Horticulture Fair organized by ICAR-IIHR, Bengaluru on 18 December, 2020.
- Virtual Scientific Advisory Committee (SAC) meeting of KVK, Davanagere on 21 December, 2020.
- Virtual Scientific Advisory Committee (SAC) meeting of KVK, Kasaragod on 23 December, 2020.
- Live telecast of PM Kisan Samman Nidhi by Hon'ble PM Shri Narendra Modi on 25 December, 2020.
- Review meeting of Nodal officer eight KVKs on 29 December, 2020.
- Organized and participated Zonal Annual Review (2019-20) and Annual Action Plan (2020-21) Workshop of ARYA Project at ATARI, Zone XI on 24 June, 2020.
- Participated in a lecture delivered by Mr. Bruno Dorin, Senior Researcher and Head, Economics and Development at the Denter De Sciences and Humaines on “Sustainable Agro-Ecological Systems” organized by NITI Ayog, New Delhi on 18 November, 2020.

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

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

- Coordinated and participated in the Farmers Science Congress organized by UAS, Bengaluru and ATARI, Zone XI, at UAS during 6 January, 2020.
- Participated in the 107th Indian Science Congress organized by UAS, Bengaluru and ATARI, Zone XI, at UAS Bengaluru during 7 January, 2020.
- Participated in the webinar on the occasion of World Food Day and 75<sup>th</sup> Anniversary of FAO on 16 October, 2020.
- Participated in the one-day workshop on “Training Management Information System (TMIS) for HRD Nodal Officers” of ICAR conducted by Human Resource Management Unit, ICAR, New Delhi on 8 May, 2020.
- Participated in the Annual Review (2019-20) and Action Plan (2020-21) Workshop of KVKs under UAS Raichur, UAS Dharwad during 28 - 30 May, 2020.
- Participated in a meeting with Karnataka Agriculture Minister's Video conference with Karnataka KVKs on 13 June, 2020.
- Participated in the National Review Workshop on ARYA-Attracting and Retaining Youth in Agriculture Project organized by Indian Council of Agricultural Research, New Delhi on 16 June, 2020.
- Coordinated the exhibition at Farmers Science Congress on 6 January, 2020 as part of the Indian Science Congress organized at GKVK, UAS Bengaluru (03-07 January, 2020). Dr. Trilochan Mohapatra, Secretary DARE & DG ICAR, inaugurated the Farmers Science Congress, which was first of its kind in the history of Indian Science Congress.
- Participated in a meeting with Karnataka Agriculture Minister's Video conference with Karnataka KVKs on 13 June, 2020.
- Associated in organization and participation in Zonal Review cum Action Plan Workshop and ZPMC meeting of Farmer FIRST on 11 June, 2020,
- Associated in organization and participation in National Review of Farmer FIRST during 17-18 June, 2020.
- Associated in organization and participation in Local Review of NEMA on 22 June, 2020.
- Associated in organization and participation in Annual Review-cum-planning workshop of UAS B KVKs during 20-21 May, 2020.
- Associated in organization and participation in Annual Review-cum-planning workshop of UAS D KVKs during 27-28 May, 2020.
- Associated in organization and participation in Annual Review-cum-planning workshop of UAHS KVKs on 30 May, 2020.
- Associated in organization and participation in Annual Review-cum-planning workshop of UAS R KVKs during 01-02 June, 2020.

- Associated in organization and participation in KVK Review Meetings as Nodal Officer on 30 December, 2020.
- Scientific Advisory Committee (SAC) Meeting of KVK, Vijayapura-I on 12 November, 2020 (F/N).
- Scientific Advisory Committee (SAC) Meeting of KVK, Vijayapura-II on 12 November, 2020 (A/N).

#### **Dr. Mallikarjun B. Hanji, Chief Technical Officer (Computer)**

- Attended the KVK EFC preparatory meeting at NASC, New Delhi on 31 January, 2020.
- Preliminary meeting of Research Advisory Committee at NASC New Delhi during 31 January, 2020 to 01 February, 2020.
- XI National KVK Conference at NASC New Delhi during 27 February, 2020 to 01 March, 2020.
- KVK EFC meeting at Division of Agricultural Extension, ICAR, New Delhi on 02 March, 2020.
- Scientific Advisory Committee meeting of KVK Kodagu on 04 December, 2020.
- Online Scientific Advisory Committee meeting of KVK, Belagavi-II on 04 November, 2020.
- Online Scientific Advisory Committee meeting of KVK, Mysuru on 28 November, 2020.
- Attended the online Scientific Advisory Committee meeting of KVK, Belagavi-I on 30 December, 2020.

#### **Shri. J. Mathew, Assistant Administrative Officer (AAO)**

- Video conference meeting of all Heads of KVK under ICAR-ATARI, Zone-XI organized by ICAR-ATARI, Bengaluru on 13 April, 2020.
- E-Office training organized by IASRI, New Delhi during 22-23 June, 2020.
- Virtual meeting on Implementation of E-Office chaired by DG (ICAR) and Secretary (DARE), New Delhi organized by ICAR, New Delhi on 24 June, 2020.

- Virtual training on TSA System of RBI organized by ICAR, New Delhi on 16 July, 2020.

#### **Shri. Shaik Rukman, Assistant Finance & Accounts Officer (AF&AO)**

- Video conference meeting of all Heads of KVK under ICAR-ATARI, Zone-XI organized by ICAR-ATARI, Bengaluru on 13 April, 2020.
- Virtual training on TSA system for Autonomous Bodies through PFMS organized by Deputy Director (Finance), ICAR-New Delhi on 16 July, 2020
- Webinar on doubling farmers income organized by ICAR-ATARI, Bengaluru on 13 October, 2020.
- Virtual World Food Day Anniversary of FAO organized by Project Director, ICAR, New Delhi on 16 October, 2020.
- Online SOC meeting organized by ICAR-ATARI, Bengaluru on 8 December, 2020.

#### **Human Resources Development**

Online capacity development programme was organized for Programme Assistants (computer) on Full Stack Web Development during 1-14 October, 2020. The programme was organized with the support of Ministry of Electronics & Information Technology, Government of India with an objective of understanding the principles of creating an effective web page, become familiar with graphic design principles, develop skills in analyzing the usability of a website, understand how to plan and conduct user research related to web usability and be able to embed social media content into web pages. The salient program features were 40 hours of live sessions, lectures from IIT Roorkee, Industry experts, 3 hours of doubt clearing sessions on weekend, access to learning material and video lectures and certificates by E & ICT Academy, IIT Roorkee.

Participants were oriented about the basics of front-end and back-end development, introduction to HTML and CSS Basics of HTML5, CSS3 and PHP fundamentals of Java script, creating forms with HTML website hosting, using FTP client File Zilla Arrays and Custom Functions, working with databases and tables followed by project development of a complete website. Thirty Program Assistants (Computer) from KVKs of Zone XI and Chief Technical Officer (Computer) from ICAR-ATARI, Zone XI, Bengaluru participated in the programme.

## Chapter - 7

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### Farmers Feedback on Assessed Technologies of Crops / Livestock

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State wise farmers feedback on performance of production technologies of crops and livestock through OFTs are presented in this chapter.



## 7. Farmers Feedback on Assessed Technologies of Crops and Livestock.

### 7.1 Karnataka

Krishi Vigyan Kendras (KVKs) assessed crop technologies in farmer's field by considering various traits like yield, profitability, product quality, consumer preferences, disease resistance, crop duration, intercropping suitability and climate adaptation.

The feedback of farmers documented on the technologies is as under:

#### (a) Varieties/hybrids

Farmers feedback on performance of crop varieties/hybrids are given in Table 147. Farmers opined that new varieties of groundnut, mustard, cowpea, bhendi, greengram, chilli, paddy, onion, pigeonpea, chickpea, fodder and turmeric gave higher yield as compared to local varieties.

**Table 147 : Farmers feedback on performance of crop varieties/hybrids**

Assessment of crop varieties/hybrids	Farmer's feedback
Groundnut varieties	G-2-52 tastes same like TMV-2 and its oil content is higher compared to local varieties.
Groundnut varieties for short duration	Ground nut variety JL-1085 is short duration variety which gave higher yield at par with GPBD-4 and higher income as compared to local variety. The low incidence of pest and disease were observed, and this helped to get higher yield and better market price. The number of pods per plant high and less disease incidence as compared to local varieties.
Mustard varieties for paddy fallows	NRCHB-101 variety performed better in paddy fallows.
Mustard varieties as alternate crop in paddy	Screening of new varieties for its adoptability in paddy fallows.
Cowpea varieties	DC-15 variety performed better than IT-38956-1 and C-152 varieties.
Bhendi hybrid - Arka Nikhitha	Not causes wounds on hands during harvesting fruits.
Greengram varieties	The KKM-3 variety gave higher yield and higher income as compared to local variety. It is also a short duration (60-65 days) as compared to local variety and this helped to grow another crop. The number of pods per plant were higher as compared to local variety.
Chilli hybrids	Lower incidence of leaf curl disease with higher number of fruits per plant were observed in Arka Meghana.
Paddy variety	The yield and crop stand of RNR 15048 was good.
Fine paddy varieties	KMLT-4 variety gave higher yield and lower disease occurrence was observed.
Sabha gidhan paddy variety	Sabha gidhan paddy variety is the short duration variety and matures in 126 days. This escapes moisture stress at later stages. Pest and disease incidence is less. Grain quality is medium and good for consumption.
Onion varieties for <i>rabi</i> season	Bhima Shakti gave higher yield and it has good market demand.
Pigeonpea varieties	Higher yield and BSMR-736 variety resistant to sterility mosaic.
Chickpea varieties for stress	Chickpea variety NBeG-47 and 49 for its adoptability through multilocation trial.
Chickpea varieties under residual soil moisture condition	Minimum incidence of wilt and root rot in BGD-103 and it was found short duration (80 - 85 days).
Fodder variety Super Napier	Napier productivity was higher. It is soft and palatable forage.
Turmeric varieties	Pragathi variety is desirable because of its short duration.

### (b) Agronomic practices

Farmers feedback on performance of agronomic practices assessed are presented in Table 148. Farmers opined that higher yield was obtained due to use of micro-nutrients and plant growth promoter in drumstick; cowpea and chickpea are suitable for cultivation as an intercrop in sugarcane; convinced vegetables as intercrops in sugarcane as they gave higher income; revalidation of row proportion in pigeonpea + pearl millet (1:2) inter cropping system and effective utilization of the available farm resources due to insitu green manuring in tree mulberry. Further, farmers opined that cob filling in maize, medium sized bulbs with uniform colour in onion and reduction in blight disease occurrence in potato due to management of nutrients gave higher yield as compared to nutrient management practices adopted by farmers.

### (c) Pest and disease management in crops

The performance of pest and disease management in black pepper, banana, cotton mango beans and bhendi were assessed and farmers feedback is presented in Table 149. Farmers opined that application of AMC, Pachonia and black pepper special reduced the spike shedding and yellowing in black pepper, use of stem injection method in banana reduced incidence of

Panama wilt, IDM practices reduced the incidence of yellow mosaic virus in pole bean and installation of sex pheromone traps near doors and windows of silkworm rearing trapped more Uzi fly, reduced the defective cocoons and helped to get higher prices in market.

### (d) Livestock

Performance of tick management and mineral supplementation in livestock were assessed. Farmers opined that medicine used for tick management is easy to apply and mineral supplementation helped to increase conception rate.

## 7.2 Kerala

Performance of crop technologies such as new crop varieties, pest and disease management, nutrient management and mechanization were assessed in farmer's field and farmers feedback is presented in Table 150. Farmers opined that new crop varieties gave higher yield, planting two plants per pit at 3 x 2 m spacing is profitable in Nendran banana cultivation, application of nano fertilizer increased the bhindi yield, use of *Trichoderma* capsule reduced wilt disease in cowpea and power weeders in vegetables cultivation is useful in performing multiple activities.

**Table 148: Farmers feedback on performance of agronomic practices**

Agronomic practices	Farmer's feedback
Crop management strategies in drumstick	Higher yield obtained due to use of micronutrients and plant growth promoter.
Pulses as intercrops in sugarcane	Cowpea and chickpea are suitable for cultivation as an intercrop in sugarcane.
Vegetables as intercrops in sugarcane	Farmers convinced about the intercropping system and achieved higher income.
Millet as intercrops in pigeonpea	Pigeonpea + pearl millet (1:2) inter cropping system performed better.
Trenching and mulching in wider spaced tree mulberry	Effective utilization of the available farm resources due to in-situ green manuring.
Technologies against Sulphur & zinc deficiency in chickpea	Increased yield with higher number of pods per plant.
Foliar nutritional management in mulberry through eco-friendly approach	Recommended NPK + FYM + foliar spray of waste decomposer solution increased the growth and yield parameters of mulberry and it was on par with foliar spray of poshan.
Nutrient management in onion.	Bulbs are medium size with uniform colour and recorded higher yield.
Nano fertilizer (N&Zn) in maize	Cobs are uniform weight and filling compared to farmer practice.
Nutrient management in potato	Due to calcium and sulphate reduced in the incidence of blight disease and increased in the quality yield

**Table 149: Farmers feedback on performance of pest and disease management in crops**

Pest and disease management in crops	Farmer's feedback
Management of yellowing and spike shedding in Black Pepper	Soil application of Arkha Microbial Consortium (AMC) and Pachonia and foliar spray with Black Pepper special reduced the spike shedding and yellowing.
Management of banana Panama wilt by using stem injection	Stem injection with carbendazim, COC and boric acid is cheap and effective method to control Panama wilt disease in banana.
Disease and pest resistance through cotton plus	Product performed better but its local availability is required.
Management of yellow mosaic virus in pole beans through integrated approach	Integrated Disease Management (IDM) practices coupled with integrated approach reduced the incidence of yellow mosaic virus in pole bean.
Management of Uzi fly in silkworm rearing	Installation of sex pheromone traps near doors and windows of silkworm rearing trapped more Uzi fly, in turn reduced the defective cocoons per cent and fetching more returns in market.
Management of shoot and fruit borer of bhendi	Farmers opined that, spraying of NSKE 4% @ 5 ml/l + Emamectin Benzoate @ 0.5 g/l + Spraying of B.t. @ 1 ml/l recorded lesser incidence of shoot and fruit borer and higher yield and net returns.

**Table 150: Farmers feedback on performance of crop technologies**

Crop technologies	Farmer's feedback
Paired row planting in Nendran Banana	Practice of planting two plants per pit at 3 x2 m spacing is the most profitable practice in Nendran banana cultivation.
Tomato hybrid for Kottayam district	Grafted tomato plants perform well with no bacterial wilt incidence and more number of harvests.
Chilly varieties for Thrissur district	Vellayani Thejus variety is gave higher yield.
Nano organic NPK in Okra	Enhancement of yield.
Organic liquid nutrient NOVEL in yard long bean	NOVEL performed better in terms of crop yield, palatability, extended harvesting period, keeping quality and lower incidence of diseases. Farmers obtained higher price for the produce because of good taste and prolonged shelf life.
Microbial inoculums for composting of organic residues	Composting tonic good for composting with attractive dark brown colour.
<i>Trichoderma</i> capsule and Talc based <i>Trichoderma</i> against wilt in cowpea	<i>Trichoderma</i> capsule is eco-friendly and effective in controlling wilt disease.
Powerweeders in vegetables	Brush cutter attached rotors easy to operate and carry the equipment in all types of fields and high weeding efficiency compared to manual method. The equipment can be used to mix the fertilizers with soil.
Phytophthora foot rot tolerant black pepper varieties	Growth and vigor of plants was highest in IISR Shakthi, followed by Panniyur 8, and IISR Thevam.
Eco-friendly management of rice bug	Field torches are more effective in controlling rice bugs.
Plant growth promoting microbes against pests and diseases of black pepper in northern midland laterite areas of Kannur	Highest yield was recorded from field treated with Arka Microbial Consortium (AMC).

## Chapter - 8

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### Personnel

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The sanctioned staff strength of ICAR-ATARI is 18, out of which 13 are in position that includes :

- Research Management Position (Director)
- Scientists (5)
- Technical Personnel (2)
- Administrative Staff (5)



## 8. Personnel

### Staff of ICAR-ATARI, Bengaluru in position as on 31 December, 2020

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





Photo Courtesy  
**KVK Kannur**



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