



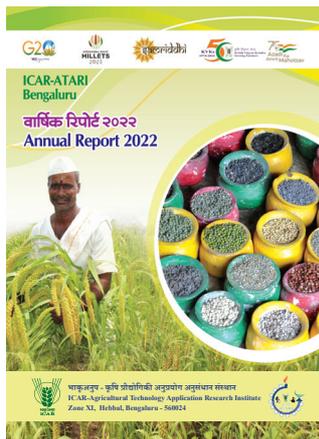
ICAR-ATARI
Bengaluru

वार्षिक रिपोर्ट २०२२
Annual Report 2022

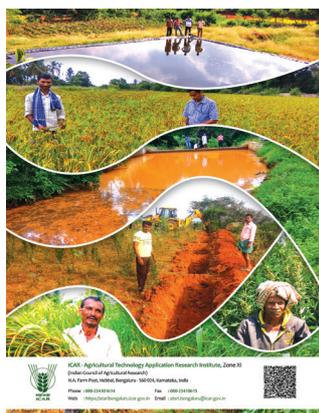


भाकृअनुप - कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
ICAR-Agricultural Technology Application Research Institute
Zone XI, Hebbal, Bengaluru - 560024





Cover page designed by
KVK Kalaburagi – I



Back page designed by
KVK Kalaburagi – I

वार्षिक प्रतिवेदन २०२२
ANNUAL REPORT 2022
ICAR-ATARI, Bengaluru



भाकृअनुप - कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
ICAR-Agricultural Technology Application Research Institute
Zone XI, Hebbal, Bengaluru - 560024

ICAR - Agricultural Technology Application Research Institute, Zone XI
H.A. Farm Post, Hebbal, Bengaluru - 560 024, Karnataka, India

Phone : 080-23510616, 23410614
Fax : 080-23410615
Email : atari.bengaluru@icar.gov.in
Website : <https://ataribengaluru.icar.gov.in>

Published by

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

Year of Publication

July, 2023

Editorial Board

Dr. M. J. Chandre Gowda
Dr. D. V. S. Reddy
Dr. B. T. Rayudu
Dr. Thimmappa K
Dr. D. V. Kolekar
Dr. Mallikarjun B. Hanji

Layout, Design and Print Coordination

Dr. Mallikarjun B. Hanji
Dr. B. T. Rayudu
Dr. Thimmappa K
Dr. D. V. Kolekar

Hindi Translation

Mr. Jagadeesan A.K.
Deputy Director (OL)
ICAR, New Delhi

Citation

Annual Report 2022, ICAR-Agricultural Technology Application Research
Institute, Zone XI, Bengaluru, Karnataka, India

Printed at

Precision Fototype Services
No 13, SNT Street,
Guptha Layout, Halasuru,
Bengaluru-560 008
Ph: 080-25364349/ 080-25546146

Contents

	Preface
i	Executive Summary (Hindi)
viii	Executive Summary (English)
1	1. About ICAR Agricultural Technology Application Research Institute
2	1.1 Mandate of ICAR-ATARI
2	1.2 ICAR- ATARI, Zone –XI, Bengaluru
3	1.3 Major activities
18	1.4 Budget
19	2. About Krishi Vigyan Kendras (KVK)
20	2.1 Establishment of KVKs
20	2.2 Vision, mission, mandate and activities of KVKs
20	2.3 Staff strength of KVKs
21	2.4 Infrastructure at KVKs
22	2.5 Scientific Advisory Committee
22	2.6 Revolving fund
23	2.7 Thrust areas
24	3. Achievements
25	3.1 Krishi Vigyan Kendras
25	3.1.1 Technology assessment
34	3.1.2 Frontline demonstrations
78	3.1.3 Capacity development
95	3.1.4 Frontline extension activities
101	3.1.5 Production of technological inputs
106	3.1.6 Kisan mobile advisory services
107	3.1.7 Soil, water and plant analysis and world soil health day celebrations
107	3.1.8 Rain water harvesting units
110	3.1.9 Convergence and linkages
119	3.1.10 Success stories and cases of large-scale adoptions
123	3.1.11 Recognition and awards
	3.1.12 Doubling farmer's income
124	3.2 Special Programmes
124	3.2.1 Cluster frontline demonstrations on pulses under NFSM
125	3.2.2 Cluster frontline demonstrations on oilseeds under NMOOP
127	3.2.3 Seed hubs
128	3.2.4 National Innovations in Climate Resilient Agriculture
142	3.2.5 Skill development programme
142	3.2.6 Attracting and Retaining Youth in Agriculture
144	3.2.7 Swachhta pakhwada
144	3.2.8 Mera Gaon-Mera Gaurav (My Village-My Pride)
145	3.2.9 District Agricultural Meteorological Units
147	3.2.10 Farmers FIRST
155	3.2.11 Agriculture Technology Information Centre
155	3.3 Technological backstopping by Directorate of Extension
156	4. Research projects
164	5. Publications
172	6. Human Resource Development
174	7. Workshops, meetings and conferences
186	8. Farmers feedback on assessed technologies of crops and livestock
193	9. Personnel



Preface

India currently is working in a double leadership mode – one with its G20 Presidency and the other with its mission to elevate Millets as the crops of the future. Ever since India got the mandate from UN to promote the year of 2023 as the International Year of Millets, it has raised hopes for so many farmers around the world who are looking for the economic benefits embedded in the millet revolution. This wonder crop, which is used as both food and fodder, is highly drought-tolerant in nature and can even grow in low fertile land. India has rightly identified the revolutionary changes that Millets are so easily capable of bringing for the entire mankind. This timely acknowledgement accompanied with right actions (Getting Millets to become the king crop of 2023) can really reverse the whole global food order towards healthy, fibrous, and nutritious food intake. The priorities set in promotion of millets globally through the G 20 programmes integrates with NITI Aayog's seven-year National Development Agenda and the medium term Three Year Action Agenda as well as the Union Budget represent the key overarching framework for the agriculture sector.

The above strategies evolved by our Hon'ble prime Minister for bringing global recognition to millets and focus areas of G 20 clearly support smallholders in enhancing productivity and competitiveness and in improving livelihood and reducing rural poverty for disadvantaged groups located not only in India but globally. Therefore, KVKs need to complement the efforts of the GoI in designing the above post-Green Revolution future for the country, wherein agri-food systems can further nutritional targets, enhance livelihoods and safeguard human and ecological health. Let us all join together with an aim to bring in technological revolution in the cultivation of millets, improve awareness and consumption of millets through designing relevant KVK programmes and events to bring the millet revolution as a part of our rainbow revolution.

Some of the significant milestone activities carried out during the year are; live webcasting Hon'ble Prime Minister programs through KVKs on 01 January, 2022, Garib Kalyan Sammelan on 31 May, 2022 and PM Kisan Samman Sammelan on 17 October, 2022; live programme of Kisan Bhagidari Prarthamikata

Hamari Campaign on 26 April, 2022 and National Campaign on Poshan Abhiyan and Tree Plantation, live streaming of the address of the Hon'ble Union Minister for Agriculture and Farmers Welfare, Govt. of India, Shri Narendra Singh Tomar on 17 September 2022; Sushri Shobha Karandlaje, Hon'ble Union Minister of State for Agriculture and Farmers Welfare, Govt. of India, New Delhi was involved in the programs viz. laying of Foundation Stone for Farmers Hostel and Staff Quarters at KVK, Belagavi-II on 19 June, 2022; foundation stone for construction of Farmers Hostel at KVK at Ballari and inauguration of seminar on 'Importance of millets and ODOP scheme of Govt. of India in ascertaining nutritional security held on 14 November, 2022.

Workshop on Technologies for Climate Smart Agriculture held at KVK, Pathanamthitta, Kerala on 7 July, 2022; farmers interaction meeting held at Kavaratti Island organized by KVK, Lakshadweep on 2 December, 2022; live webcasting of 94th Foundation Day of Indian Council of Agricultural Research & Awards Ceremony - 2022 held on 16 July, 2022; 12th Biennial National Krishi Vigyan Kendra Conference – 2022; visit of Dr. Trilochan Mohapatra, Secretary, DARE and Director General, ICAR, New Delhi to KVK, Lakshadweep at Kavaratti on 16 April, 2022, ICAR-ATARI, Bengaluru organized a wide spectrum of programmes during the year viz., Annual review (2021) cum action plan workshops (2022-23) of KVKs in different phases, Celebration of World Women's Day, Review cum ZPMC meeting of Farmer FIRST Programme, Special Swachhata Campaign, Institute foundation day etc. were some of important activities conducted during the period of Annual Report.

During this year KVKs in the zone have conducted 220 On Farm Tests (OFTs) through which 494 technologies were assessed and a total of 5268 frontline demonstrations were organized in crops, livestock and enterprises in the states of Karnataka, Kerala and Lakshadweep Islands as an effort to promote adoption of improved technologies. KVKs have also organized 5724 capacity development courses which includes 3977 courses for farmers, 580 courses for rural youth, and 318 courses for extension personnel. Vocational development courses were mostly organized on dairy farming with 21 courses and 802 participants followed by value addition with 20 courses and 376 participants.

A total of 1.22 lakh frontline extension activities were organized to create awareness among 13.25 lakh farmers and 0.45 lakh extension personnel on varieties, production technologies, integrated pest and disease management, animal health and nutrition, poultry production, fisheries management and human nutrition. To support technology uptake, produced and supplied 3520.18 q of seeds of different crop varieties, 27.24 lakh planting material of different crops and hybrids, 3.96 lakh livestock strains and fish fingerlings benefiting 2.90 lakh farmers, besides production and supply of 8012.99 q of bio-products through which 1.84 lakh farmers were motivated to adopt bio-control by reducing use of chemicals by the KVKs under ATARI, Bengaluru.

Further, KVKs published 191 research papers, 149 training manuals and technical bulletins, 306 popular articles and 305 extension literatures with a view to create mass awareness among the farming community on the improved technologies during the year.

The special programmes such as NICRA Project, CFLDs in pulses and oilseeds, ARYA and Farmer FIRST programme are being implemented with several interventions at the field level in crop, horticulture, livestock, natural resource management, enterprise and integrated farming system modules.

During the year KVK Ramanagara received Pandit Deendayal Upadhyay Rashtriya Krishi Vigyan Protsahan Puraskar-2021 and KVK Tumakuru II received 3rd National Water Awards-2020. Farmers of the zone received Pandit Deen Dayal Antyodaya Puraskar, Pandit Deen Dayal Upadhyay Antyodaya Krishi Puraskar 2021, Haldar Organic Farmer Award 2021 and Jagjivan Ram Innovative Farmer Award 2021.

The activities carried out by ICAR-ATARI, Bengaluru and its constituent KVKs during the year 2022 were compiled and presented here with good illustrations and photos. My hearty congratulations to our ATARI and KVK team for giving their best efforts and support to prepare this holistic and focused report.

It is my honour and pleasure to bring out the Annual Report 2022 of ATARI, Bengaluru as a testimony of the valuable contribution made by the KVKs of Karnataka, Kerala and Lakshadweep towards farmers' prosperity through sustainable agricultural development.

(V. VENKATASUBRAMANIAN)

DIRECTOR

11 July 2023

विशिष्ट सारांश

विशिष्ट सारांश हिंदी और अंग्रेज़ी में दिया गया है



विशिष्ट सारांश

आईसीएआर-अटारी, बेंगलुरु, क्षेत्र-XI के परिचालन क्षेत्राधिकार में 48 कृषि विज्ञान केंद्र हैं, जिनमें से कर्नाटक में 33, केरल में 14 और लक्षद्वीप में एक है। ये कृषि विज्ञान केंद्र विभिन्न मेजबान संगठनों, जैसे राज्य कृषि विश्वविद्यालय (33 कृषि विज्ञान केंद्र), गैर-सरकारी संगठन (8 कृषि विज्ञान केंद्र) और आईसीएआर संस्थान (7 कृषि विज्ञान केंद्र) के प्रशासनिक नियंत्रण में हैं।

कृषि विज्ञान केंद्र का अधिदेश अनुप्रयोग और क्षमता विकास के लिए प्रौद्योगिकी मूल्यांकन और प्रदर्शन है। इसे प्रक्षेत्र परीक्षण, अग्रिम पंक्ति प्रदर्शन, क्षमता विकास, विस्तार गतिविधियों और कृषि सलाह, तकनीकी उत्पादों के उत्पादन और आपूर्ति के माध्यम से प्राप्त किया जाता है और इस तरह जिला स्तर पर वैज्ञानिक खेती पर ज्ञान और संसाधन केंद्र के रूप में कार्य किया जाता है।

आईसीएआर-अटारी, बेंगलुरु की प्रमुख गतिविधियाँ

माननीय प्रधान मंत्री जी के कार्यक्रम

- आईसीएआर-अटारी, बेंगलुरु ने क्षेत्र-XI के कृषि विज्ञान केंद्रों के लिए 01 जनवरी, 2022 को आयोजित प्रधान मंत्री के कार्यक्रम, 31 मई, 2022 को आयोजित गरीब कल्याण सम्मेलन और 17 अक्टूबर, 2022 को आयोजित प्रधान मंत्री किसान सम्मान सम्मेलन के लाइव वेबकास्टिंग का समन्वयन किया। कुल मिलाकर 21723 किसानों ने कर्नाटक, केरल और लक्षद्वीप में अपने संबंधित कृषि विज्ञान केन्द्रों में लाइव टेलीकास्ट कार्यक्रमों में भाग लिया।

माननीय केन्द्रीय एवं राज्यल मंत्रियों के कार्यक्रम

आईसीएआर-अटारी, बेंगलुरु ने निम्नलिखित कार्यक्रमों का समन्वयन किया :

- माननीय केन्द्रीय राज्य मंत्री श्री भगवंत खुबा ने 21 अगस्त, 2022 को कृषि विज्ञान केंद्र, कोल्लम का दौरा किया।
- 26 अप्रैल, 2022 को माननीय केन्द्रीय मंत्री और केन्द्रीय राज्य मंत्रियों द्वारा आजादी का अमृत महोत्सव के एक भाग के रूप में 'किसान भागीदारी प्राथमिकता हमारी' अभियान का लाइव कार्यक्रम; पोषण अभियान और वृक्षारोपण पर राष्ट्रीय अभियान; 17 सितंबर 2022 को माननीय केन्द्रीय कृषि और किसान कल्याण मंत्री श्री नरेंद्र सिंह तोमर के संबोधन का लाइव प्रसारण किया गया।
- सुश्री शोभा करंदलाजे, माननीय केन्द्रीय कृषि एवं किसान कल्याण राज्य मंत्री, भारत सरकार, नई दिल्ली निम्नलिखित कार्यक्रमों में शामिल थीं। 19 जून, 2022 को कृषि विज्ञान केन्द्र, बेलगावी-II में किसान छात्रावास और कर्मचारी

आवास के लिए आधारशिला रखना; बल्लारी में 14 नवंबर, 2022 को कृषि विज्ञान केन्द्रग में किसान छात्रावास के निर्माण के लिए आधारशिला रखना और 'पोषण सुरक्षा सुनिश्चित करने में श्रीअन्न का महत्व और सरकार की एक जिला, एक उत्पाद योजना' पर सेमिनार का उद्घाटन; 7 जुलाई, 2022 को कृषि विज्ञान केन्द्रक, पत्तनमतिट्टा, केरल में जलवायु स्मार्ट कृषि के लिए प्रौद्योगिकियों पर आयोजित कार्यशाला का उद्घाटन; 2 दिसंबर, 2022 को कृषि विज्ञान केन्द्र, लक्षद्वीप द्वारा कावरत्ती द्वीप में आयोजित किसान परिचर्चा बैठक; 14 नवंबर, 2022 को सिरिगेरे, चित्रदुर्ग, कर्नाटक में कृषि विज्ञान केन्द्र, दावणगेरे द्वारा स्थापित एफपीओ का विशेष परिचर्चा कार्यक्रम।

भारतीय कृषि अनुसंधान परिषद के कार्यक्रम

- आईसीएआर-अटारी, बेंगलुरु ने 16 जुलाई, 2022 को आयोजित भारतीय कृषि अनुसंधान परिषद के 94वें स्थापना दिवस और पुरस्कार समारोह - 2022 की लाइव वेबकास्टिंग का समन्वयन किया, जिसमें 3759 किसानों और अन्य प्रतिभागियों ने केरल, कर्नाटक और लक्षद्वीप में अपने संबंधित कृषि विज्ञान केंद्र में प्रसारण कार्यक्रम देखा; 12वां द्विवार्षिक राष्ट्रीय कृषि विज्ञान केंद्र सम्मेलन-2022 दिनांक 1-2 जून, 2022 के दौरान आयोजित किया गया, जिसमें क्षेत्र-XI के सभी 48 कृषि विज्ञान केंद्र ने भाग लिया; और 16 अप्रैल, 2022 को डॉ. त्रिलोचन महापात्र, सचिव, डेयर और महानिदेशक, आईसीएआर, नई दिल्ली का कवरत्ती में कृषि विज्ञान केंद्र, लक्षद्वीप का दौरा।

प्रमुख दिवस, जागरूकता कार्यक्रम और अन्य विशेष कार्यक्रम

- आईसीएआर-अटारी, बेंगलुरु ने 01.11.2022 को कन्नड़ राज्योत्सव के साथ अपना स्थापना दिवस मनाया, जिसमें अटारी के सभी कर्मचारियों ने भाग लिया। डॉ. मल्लिकार्जुन बी. हांजी, मुख्य तकनीकी अधिकारी (कंप्यूटर) और श्रीमती रामोला पिंटो, कनिष्ठ आशुलिपिक ने सर्वश्रेष्ठ प्रदर्शन के लिए स्थापना दिवस पुरस्कार-2022 प्राप्त किया।
- रिपोर्टाधीन वर्ष के दौरान, आईसीएआर-अटारी, बेंगलुरु ने अपने 48 कृषि विज्ञान केंद्रों के माध्यम से आजादी का अमृत महोत्सव के एक भाग के रूप में विभिन्न कार्यक्रमों का समन्वयन किया, जैसे कि 6747 प्रतिभागियों को शामिल करके अंतर्राष्ट्रीय महिला दिवस, 2011 के किसानों को शामिल करके विश्व दाल दिवस, 1614 प्रतिभागियों के साथ अंतर्राष्ट्रीय योग दिवस, 5099 हितधारकों की भागीदारी के साथ विश्व मृदा दिवस, 3080 किसानों को शामिल करके उर्वरकों के कुशल और संतुलित उपयोग पर जागरूकता अभियान, 13254

प्रतिभागियों के साथ विशेष स्वच्छता अभियान 2.0, कृषि विज्ञान केंद्र, पत्तनमतिट्टा द्वारा एक जिला एक उत्पाद के तहत कटहल उत्पादों पर विशेष डाक लिफाफे का विमोचन और पद्म श्री पुरस्कार विजेता श्री अमाई महालिंग नाइक, का अभिनंदन।

कार्यशालाएँ और बैठकें

- रिपोर्टाधीन वर्ष के दौरान, आईसीएआर-अटारी, बेंगलुरु ने विभिन्न कार्यक्रमों का समन्वय और आयोजन किया, जैसे 11 फरवरी, 2022 को कर्नाटक एफपीओ के लिए प्रौद्योगिकी सहायता पर कार्यशाला; 19 - 22 जून, 2022 के दौरान कृषि विज्ञान केंद्र की क्षेत्रीय कार्यशाला-2022; 13-14 जून, 2022 के दौरान एनआईसीआरए चरण- II का शुभारंभ-सह-वार्षिक समीक्षा 2021-22 और वार्षिक कार्य योजना 2022-23 कार्यशाला; क्षेत्र-XI के तहत कृषि विज्ञान केंद्र की वार्षिक समीक्षा-सह-कार्य योजना बैठकें (21 से 23 अप्रैल, 2022 के दौरान चरण I; 28 से 30 अप्रैल 2022 के दौरान चरण- II; 4 से 6 मई, 2022 के दौरान चरण-III); और 17 अगस्त, 2022 को फार्मर फर्स्ट कार्यक्रम की समीक्षा-सह-जेडपीएमसी बैठक।

कृषि विज्ञान केंद्रों की मुख्य उपलब्धियाँ

प्रौद्योगिकियों का मूल्यांकन

- इस क्षेत्र के कृषि विज्ञान केंद्रों ने 1002 किसानों को शामिल करके 1003 परीक्षणों के माध्यम से 494 प्रौद्योगिकियों का आकलन करने के लिए 220 प्रक्षेत्र परीक्षण आयोजित किए, जिनमें से 143 प्रक्षेत्र परीक्षण कर्नाटक के कृषि विज्ञान केंद्रों द्वारा, 76 प्रक्षेत्र परीक्षण केरल के कृषि विज्ञान केंद्रों द्वारा और एक प्रक्षेत्र परीक्षण लक्षद्वीप के कृषि विज्ञान केंद्र द्वारा आयोजित किए गए थे।
- फसलों पर आयोजित 184 प्रक्षेत्र परीक्षणों में से 122 प्रक्षेत्र परीक्षण कर्नाटक में और 62 प्रक्षेत्र परीक्षण केरल में किए गए थे। 436 प्रौद्योगिकी विकल्पों के आकलन के लिए कुल 781 परीक्षण किए गए। कर्नाटक के कृषि विज्ञान केंद्रों ने 474 परीक्षणों के माध्यम से 291 प्रौद्योगिकी विकल्पों का मूल्यांकन किया और केरल के कृषि विज्ञान केंद्रों ने 307 परीक्षणों के माध्यम से 145 प्रौद्योगिकी विकल्पों का मूल्यांकन किया।
- पशुधन घटक में, कृषि विज्ञान केंद्रों ने 26 प्रक्षेत्र परीक्षण आयोजित किए, जिनमें से 16 कर्नाटक में, 9 केरल में और एक लक्षद्वीप में था। इसे 155 परीक्षणों के माध्यम से हासिल किया गया, जिसमें कर्नाटक में 79, केरल में 72 और लक्षद्वीप में चार शामिल थे। 48 प्रौद्योगिकी विकल्पों के मूल्यांकन में कर्नाटक में 33, केरल में 14 और लक्षद्वीप में एक शामिल है।

- उद्यमों के तहत प्रौद्योगिकी विकल्पों का मूल्यांकन 67 परीक्षणों द्वारा कुल 10 प्रक्षेत्र परीक्षणों के माध्यम से किया गया, जिनमें कर्नाटक में 25 और केरल में 42 में थे।

अग्रिम पंक्ति प्रदर्शन

- कर्नाटक, केरल और लक्षद्वीप राज्यों में कुल 5268 अग्रिम पंक्ति प्रदर्शन आयोजित किए गए, जिनमें अनाज और श्रीअन्न पर 1430, तिलहन पर 466, दलहन पर 602, वाणिज्यिक फसलों पर 100, रेशा फसलों पर 73, चारा फसलों पर 119, सब्जी फसलों पर 450, कंद फसलों पर 70, फल फसलों पर 223, पुष्प फसलों पर 56, रोपण फसलों पर 137, मसालों पर 251, हरी खाद वाली फसलों पर 15, विभिन्न फसलों के संकरों पर 338 प्रदर्शन, इसके अलावा कृषि फार्म उपकरणों पर 205 प्रदर्शन, पशुधन पर 213 प्रदर्शन, मत्स्य पालन पर 163 और उद्यमों पर 367 प्रदर्शन शामिल हैं।
- अनाज और श्रीअन्न: कर्नाटक के कृषि विज्ञान केंद्र ने 407.50 हेक्टेयर में धान, गेहूं, ज्वार, मक्का, बाजरा, रागी, छोटी बाजरा, कंगनी, छोटी कंगनी पर 1116 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने 139.20 हेक्टेयर में धान पर 314 अग्रिम पंक्ति प्रदर्शन आयोजित किए।
- तिलहन, दलहन और वाणिज्यिक फसलें: कर्नाटक के कृषि विज्ञान केंद्र ने 155.80 हेक्टेयर में मूंगफली, सूरजमुखी, रामतिल, अरंडी, सरसों, कुसुम, तिल और सोयाबीन पर 456 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने तिल पर 1.00 हेक्टेयर में 10 अग्रिम पंक्ति प्रदर्शन, दलहन फसलों जैसे, काबूली चना, उड़द, फाबा सेम, मूंग, कुलथी, अरहर और ग्वार फली पर 215.00 हेक्टेयर में 602 अग्रिम पंक्ति प्रदर्शन आयोजित किए, 32.50 हेक्टेयर में गन्ना, शहतूत, सुपारी और बांस जैसे वाणिज्यिक फसलों पर 100 अग्रिम पंक्ति प्रदर्शन, 29.40 हेक्टेयर में कपास पर 73 अग्रिम पंक्ति प्रदर्शन और 6.00 हेक्टेयर में हरी खाद वाली फसल पर 15 अग्रिम पंक्ति प्रदर्शन आयोजित किए।
- चारा फसलें: कर्नाटक के कृषि विज्ञान केंद्र ने 18.90 हेक्टेयर में चारे पर 100 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने 0.31 हेक्टेयर में चारा फसल पर और चारा फसल के रूप में सहजन पर 15 अग्रिम पंक्ति प्रदर्शन आयोजित किए और कृषि विज्ञान केंद्र, लक्षद्वीप ने 2.00 हेक्टेयर में गिनी घास और चारा ज्वार पर 4 अग्रिम पंक्ति प्रदर्शन आयोजित किए।
- सब्जी फसलें: कर्नाटक के कृषि विज्ञान केंद्र ने बैंगन, पत्तागोभी, बेबी कॉर्न, प्याज, शिमला मिर्च, फूलगोभी, मिर्च, टमाटर, लंबी लोबिया, काकड़, स्वीट कॉर्न, तुरई, फ्रेंच बीन, ककड़ी, सहजन,

- पोल बीन, मिश्रित सब्जियां, न्यूट्री-गार्डन पर 118.08 हेक्टेयर में 343 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने चौलाई, करेला, ककड़ी, फ्रेंचबीन, भिंडी, लंबी लोबिया पर 8.56 हेक्टेयर में 107 अग्रिम पंक्ति प्रदर्शन का आयोजन किया।
- कंद फसलें: कर्नाटक के कृषि विज्ञान केंद्र ने 4.20 हेक्टेयर में जिमीकंद, आलू, शकरकंद पर 24 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने 2.98 हेक्टेयर में अमोर्फोफेलस, कसावा, शकरकंद, अरबी पर 46 अग्रिम पंक्ति प्रदर्शन आयोजित किए।
 - फल फसलें: कर्नाटक के कृषि विज्ञान केंद्र ने केला, काजू, सीता फल, अंजीर, अंगूर, अमरूद, नीबू, आम, अनार, अजवाइन पर 78.40 हेक्टेयर में 202 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने 0.80 हेक्टेयर में केले पर 21 अग्रिम पंक्ति प्रदर्शन आयोजित किए।
 - रोपण फसलें: कर्नाटक के कृषि विज्ञान केंद्र ने 45.00 हेक्टेयर में नारियल, सुपारी, कॉफी पर 125 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने 1.60 हेक्टेयर में नारियल पर 12 अग्रिम पंक्ति प्रदर्शन आयोजित किए।
 - मसाला फसलें: कर्नाटक के कृषि विज्ञान केंद्र ने 55.50 हेक्टेयर में काली मिर्च, अदरक, हल्दी, मिर्च पर 171 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने 7.18 हेक्टेयर में काली मिर्च, लहसुन, अदरक, हल्दी और झाड़ीदार काली मिर्च (20 इकाइयां) पर 80 अग्रिम पंक्ति प्रदर्शन आयोजित किए।
 - फूलों की फसलें: कर्नाटक के कृषि विज्ञान केंद्र ने 8.40 हेक्टेयर में गुलदाउदी, चमेली, गेंदा, गुलाब, रजनीगंधा पर 49 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने 0.16 हेक्टेयर में गेंदा पर 7 अग्रिम पंक्ति प्रदर्शन आयोजित किए।
 - संकर किस्मों पर प्रदर्शन: कर्नाटक के कृषि विज्ञान केंद्र ने मक्का, बाजरा, स्वीट कॉर्न, सूरजमुखी, अरंडी, गेंदा, हरी मिर्च, सूखी मिर्च, बीटी कपास, टमाटर, भिंडी, करेला, बैंगन, पत्तागोभी, फूलगोभी, खीरा, तरबूज, रजनीगंधा, सेम फली जैसी फसलों पर 112.50 हेक्टेयर में 328 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने 0.40 हेक्टेयर में तुरई और सलाद ककड़ी पर 10 अग्रिम पंक्ति प्रदर्शन आयोजित किए।
 - कृषि उपकरण/यंत्र: कर्नाटक के कृषि विज्ञान केंद्र ने चने में सौर ऊर्जा-चालित निपिंग मशीन, सौर और सूरज की रोशनी में लाल मिर्च को सुखाने, हस्त-चलित प्याज का बीजने की मशीन, बैटरी-चालित प्याज का डीटॉपर, सोयाबीन स्पाइरल सेपरेटर, धान में ट्रैक्टर-चालित बेलर, गुणवत्तापूर्ण कोकून उत्पादन के लिए घूर्णी माउंटेज पर 105 अग्रिम पंक्ति प्रदर्शन आयोजित किया, जबकि केरल के कृषि विज्ञान केंद्र ने धान में ड्रोन तकनीक, नारियल में टेबल टॉप स्क्रू ऑयल एक्सपेलर, पावर टिलर-चालित नारियल बेसिन डिगर, चारा फसलों में पोर्टेबल हाई हेड स्प्रीकलर गन, पेडल-चालित श्रीअन्न डिहल्लर, बिजली-चालित जायफल बीज शेलर, हल्दी में ट्रैक्टर-चालित रूट हार्वेस्टर और फलों और सब्जियों के लिए सोलर ड्रायर पर 100 अग्रिम पंक्ति प्रदर्शन आयोजित किए।
 - फार्म उद्यम: कर्नाटक के कृषि विज्ञान केंद्र ने कृषि वानिकी, रेशम उत्पादन, मधुमक्खी पालन, रेशम फार्म अपशिष्ट से कम्पोस्ट, खाद, वर्मीकम्पोस्ट और आम, अदरक, केला, कटहल, मसाले, गुड़, इमली, नारियल, श्रीअन्न, मिर्च, अंजीर, अनन्नास के मूल्यवर्धन पर 627 किसानों/खेतिहर महिलाओं को शामिल करते हुए 226 घरेलू स्तर की फार्म उद्यमों का प्रदर्शन किया। केरल के कृषि विज्ञान केंद्र ने 141 किसानों/खेतिहर महिलाओं को शामिल करके खाद उत्पादन, एकीकृत खेती, मशरूम उत्पादन, बीज उत्पादन और प्रसंस्करण पर ईडीपी और कटहल, मत्स्य पालन, टैपिओका, श्रीअन्न, नारियल, गार्सिनिया, केला, फल और सब्जियां और शहद के मूल्यवर्धन पर छोटे पैमाने की विभिन्न उद्यमों का प्रदर्शन किया गया।
 - पशुधन और मत्स्य पालन: कर्नाटक के कृषि विज्ञान केंद्र ने 151 इकाइयों के माध्यम से 163073 पशुधन को शामिल करके डेयरी गाय, डेयरी भैंस, मुर्गी पालन और बत्तख पालन, सुअर पालन, भेड़ और बकरी, मत्स्य पालन पर 608 अग्रिम पंक्ति प्रदर्शन आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने 232 इकाइयों के माध्यम से 79111 पशुधन को शामिल करके डेयरी गाय, मुर्गी पालन और बत्तख पालन, भेड़ और बकरी, मत्स्य पालन पर 397 अग्रिम पंक्ति प्रदर्शन आयोजित किए और कृषि विज्ञान केंद्र, लक्षद्वीप ने 4 इकाइयों के माध्यम से 40 किसानों को शामिल करके मुर्गी पालन पर चार अग्रिम पंक्ति प्रदर्शन आयोजित किए।
 - महिलाओं और बच्चों का सशक्तिकरण: कर्नाटक के कृषि विज्ञान केंद्र ने 21919 महिलाओं के लिए 474 कार्यक्रम और 1529 बच्चों के लिए 28 कार्यक्रम आयोजित किए, जबकि केरल के कृषि विज्ञान केंद्र ने 19660 महिलाओं के लिए 283 कार्यक्रम और 1255 बच्चों के लिए 30 कार्यक्रम आयोजित किए।

क्षमता विकास

- कृषि विज्ञान केंद्र ने 5,724 क्षमता विकास पाठ्यक्रम आयोजित किए, जिनमें किसानों के लिए 3,977 पाठ्यक्रम, ग्रामीण युवाओं के लिए 580 पाठ्यक्रम और विस्तार कर्मियों के लिए 318 पाठ्यक्रम शामिल थे। कुल 2,03,641 प्रतिभागियों को प्रशिक्षित किया गया, जिनमें 1,42,631 किसान, 18,476 ग्रामीण युवा और 12,345 विस्तार कर्मी शामिल थे। इसके अतिरिक्त 661 प्रायोजित एवं 188 व्यावसायिक पाठ्यक्रम आयोजित किये गये।
- किसानों के लिए क्षमता विकास का प्रमुख क्षेत्र फसल उत्पादन था, जिसमें 35,256 किसानों को शामिल करते हुए 937 पाठ्यक्रम आयोजित किए गए। गृह विज्ञान/महिला सशक्तिकरण (544) और पौध संरक्षण (543) पर क्षमता विकास पाठ्यक्रम अगला सबसे अधिक पसंदीदा पाठ्यक्रम थे, जिसके बाद पशुधन उत्पादन और प्रबंधन (467 पाठ्यक्रम) का स्थान था।
- ग्रामीण युवाओं को जैव कारकों के उत्पादन, एकीकृत फसल प्रबंधन, सब्जियों की खेती, एक्वापोनिक्स, नारियल पर चढ़ने का यंत्र और पीसीआरए (116 पाठ्यक्रम, 4331 प्रतिभागी) और मूल्य संवर्धन (86 पाठ्यक्रम, 2681 प्रतिभागी) पर प्रशिक्षित किया गया।
- विस्तार पदाधिकारियों को उत्पादक सामग्री विक्रेता, रेशम उत्पादन, नर्सरी प्रबंधन, बीज उत्पादन, दुधारू पशुओं में रोग प्रबंधन, सस्योत्तर प्रबंधन, कृषक उत्पादक संगठन, प्राकृतिक खेती, जल प्रबंधन, खाद बनाने की तकनीक, मूल्य संवर्धन, प्रसंस्करण, एकीकृत कृषि प्रणाली, खाद्य सुरक्षा के विषयों में क्षमता निर्माण पर प्रशिक्षित किया गया, जिनमें 91 पाठ्यक्रम और 3,700 प्रतिभागी थे। इसके बाद समेकित कीट प्रबंधन (38 पाठ्यक्रम, 1,336 प्रतिभागी) का स्थान था।
- प्रायोजित पाठ्यक्रम (112) जैव ईंधन, प्याज में समेकित फसल प्रबंधन, वैज्ञानिक मधुमक्खी पालन, समेकित कृषि प्रणाली, ऊर्जा कुशल पंप सेट और जल संरक्षण, किसान उत्पादक संगठन, फ्रेंड्स ऑफ कोकनट ट्री, आरएडब्ल्यूई, समेकित पोषक तत्व प्रबंधन, आईएमसी, डीईईएसआई, पीएमएफएमई, छत पर कृषि, जनजातीय विस्तार केंद्र पर 3,771 किसानों/ग्रामीण युवाओं/विस्तार पदाधिकारियों की भागीदारी के साथ 112 प्रायोजित पाठ्यक्रम आयोजित किए गए, इसके बाद प्रसंस्करण और मूल्यवर्धन 1984 प्रतिभागियों के साथ आयोजित 61 कार्यक्रम का स्थान था।
- व्यावसायिक विकास पाठ्यक्रम ज्यादातर डेयरी फार्मिंग पर आयोजित किए गए, जिसमें 802 प्रतिभागियों के साथ 21

पाठ्यक्रम आयोजित किए गए, इसके बाद मूल्य संवर्धन पाठ्यक्रम का स्थान था, जिसमें 376 प्रतिभागियों के साथ 20 पाठ्यक्रम आयोजित किए गए।

फ्रंटलाइन विस्तार कार्यक्रम

- कृषि विज्ञान केंद्र ने कुल 1.22 लाख फ्रंटलाइन विस्तार गतिविधियाँ आयोजित कीं और 1.48 लाख अनुसूचित जाति/जनजाति के किसानों और 0.45 लाख विस्तार कर्मियों सहित 13.25 लाख किसानों के बीच किस्मों, उत्पादन प्रौद्योगिकियों, एकीकृत कीट और रोग प्रबंधन, पशु स्वास्थ्य और पोषण, पोल्ट्री उत्पादन, मत्स्य प्रबंधन और मानव पोषण पर जागरूकता पैदा की।
- कृषि विज्ञान केंद्र ने समाचार पत्र (1763), रेडियो प्रसारण/वार्ता (399), टीवी प्रसारण/वार्ता (148) और सीडी/डीवीडी/लघु वीडियो (135) के अतिरिक्त विस्तार साहित्य (493) और लोकप्रिय लेख (255) प्रकाशित किए।

तकनीकी इनपुट का उत्पादन

- फसलों की विभिन्न किस्मों के 3520.18 क्विंटल बीजों, विभिन्न फसल संकरों की 27.24 लाख रोपण सामग्रियों, 3.96 लाख पशुधन नस्लों और छोटी मछलियों को उत्पादित कर आपूर्ति की गई, जिससे 2.90 लाख किसानों को लाभ हुआ।
- 8012.99 क्विंटल जैव उत्पादों को उत्पादित कर आपूर्ति की गई, जिसके माध्यम से 1.84 लाख किसानों को रसायनों के उपयोग को कम करके जैव-नियंत्रण विधियों को अपनाने के लिए प्रेरित किया गया।

किसान मोबाइल सलाहकार सेवाएँ

- इस क्षेत्र के 31 कृषि विज्ञान केंद्रों ने 3.96 लाख किसानों को 15,294 मोबाइल संदेश भेजे। ये संदेश जागरूकता (5091) के बाद फसलों (4720), पशुधन (2059), अन्य उद्यमों (1679) और विपणन (880) से संबंधित थे।

मिट्टी, पानी और पौधे का विश्लेषण

- कृषि विज्ञान केंद्रों ने 14,730 गांवों के 30,526 किसानों से प्राप्त मिट्टी, पानी, पौधे और जैविक खाद के 36,512 नमूनों का विश्लेषण किया, जिसके आधार पर किसानों को 5,847 मृदा स्वास्थ्य कार्ड वितरित किए गए।
- विश्व मृदा दिवस 5 दिसंबर, 2022 को अटारी, बेंगलुरु के 47 कृषि विज्ञान केंद्रों में "मिट्टी: जहां से आहार शुरू होता है" विषय पर मनाया गया, जिसमें 3373 किसानों, 300 वैज्ञानिकों, 122 वीआईपी और 1292 छात्रों ने भाग लिया।

वर्षा जल संचयन इकाइयाँ

- 12 कृषि विज्ञान केंद्रों में स्थापित वर्षा जल संचयन और पुनर्चक्रण इकाइयों का उपयोग 37 क्षमता विकास कार्यक्रमों और 40 प्रदर्शनों को आयोजित करने के लिए किया गया था। इस सुविधा का उपयोग कृषि विज्ञान केंद्रों में उपयोग के लिए 2,00,476 रोपण सामग्री का उत्पादन करने और किसानों को प्रदान करने के लिए किया गया था। इन इकाइयों का 8,263 किसानों और 166 अधिकारियों ने दौरा किया और वर्षा जल संचयन तकनीकों का अवलोकन किया।

कृषि विज्ञान केंद्रों का सम्मिलन और लिंकेज

- एटीएमए के साथ सम्मिलन के अंग के रूप में, कृषि विज्ञान केंद्रों ने एटीएमए द्वारा आयोजित 956 कार्यक्रमों में भाग लिया और साथ ही कृषि विज्ञान केंद्रों ने एटीएमए के सहयोग से 553 कार्यक्रमों का आयोजन किया।
- कर्नाटक नवीकरणीय ऊर्जा विकास लिमिटेड, बेंगलुरु; मैनेज, हैदराबाद; संजीवनी-कर्नाटक राज्य ग्रामीण आजीविका संवर्धन सोसायटी, बेंगलुरु; राष्ट्रीय कृषि विकास योजना (आरकेवीवाई); राष्ट्रीय बागवानी मिशन (एनएचएम); आईसीएआर के विभिन्न संस्थानों की परियोजनाएँ और राष्ट्रीय कृषि और ग्रामीण विकास बैंक (नाबार्ड) प्रमुख एजेंसियाँ थीं, जिन्होंने विभिन्न कार्यक्रमों और गतिविधियों को आयोजित करने के लिए कृषि विज्ञान केंद्रों को वित्त पोषण/समर्थन दिया।

किसानों की आय दुगुना करना

- ऐसे किसानों, जिनकी आय कृषि विज्ञान केंद्र की मदद के कारण दुगुनी हो गई, के कुल 5,193 सफल मामले दर्ज किए गए, जिनमें कर्नाटक से 3,648 मामले और केरल से 1,545 मामले शामिल हैं।

सफल गाथाएँ और प्रौद्योगिकियों के बड़े पैमाने पर अपनाने के मामले

- कृषि विज्ञान केंद्रों ने रिपोर्टाधीन वर्ष के दौरान उत्पादकता बढ़ाने और किसानों की आय बढ़ाने के संदर्भ में प्रौद्योगिकियों के प्रदर्शन के आधार पर कई सफलताएँ हासिल की हैं। कुछ प्रलेखित महत्वपूर्ण सफल गाथाएँ हैं:
- रबी ज्वार किस्म-एसपीवी-2217 (कृषि विज्ञान केंद्र, बेलगावी-II), मेमनों में दूध छुड़ाने के बाद इष्टतम विकास के लिए प्रोबायोटिक्स (कृषि विज्ञान केंद्र, बेंगलुरु ग्रामीण), अदरक कैंडी - थोड़ा, लेकिन सभी के लिए कुछ (कृषि विज्ञान केंद्र, बीदर), श्रीमती साकम्मा - एक श्रीअन्न उद्यमी (कृषि विज्ञान केंद्र, मांड्या), अमरेश शरणप्पा कोटे द्वारा ड्रिप लेटरल रोलिंग

डिवाइस (कृषि विज्ञान केंद्र, रायचूर), बीआरजी-3 - झुलसा और बंध्यता मोज़ेक का प्रतिरोधी अरहर किस्म (कृषि विज्ञान केंद्र, रामानगर), एफपीओ- उडुपी कल्परस नारियल और सभी मसाला उत्पादक कंपनी (यूकेसीएएएस) (कृषि विज्ञान केंद्र, उडुपी), भेड़ पालन: किसान के लिए एक वरदान (कृषि विज्ञान केंद्र, चिक्काबल्लापुरा), एक युवा खेतिहर महिला ने डेयरी फार्मिंग के माध्यम से सफलता हासिल की (कृषि विज्ञान केंद्र, आलपुष्पा), मशरूम के साथ कॉफी के स्वाद का मिश्रण- कृषि उद्यमशीलता में नवीन पहल (कृषि विज्ञान केंद्र, कोल्लम), आम के बगीचे का पर्यावरण-अनुकूल प्रबंधन (कृषि विज्ञान केंद्र, पालक्काड़), सुश्री सुजा - एक उभरती नर्सरी उद्यमी (कृषि विज्ञान केंद्र, पत्तनमतिट्टा)।

पुरस्कार और मान्यता

- कृषि विज्ञान केंद्र, रामनगर को पंडित दीनदयाल उपाध्याय राष्ट्रीय कृषि विज्ञान प्रोत्साहन पुरस्कार-2021 प्राप्त हुआ और कृषि विज्ञान केंद्र ए तुमकूरु-II को तीसरा राष्ट्रीय जल पुरस्कार-2020 प्राप्त हुआ।
- इस क्षेत्र के किसानों को पंडित दीन दयाल अंत्योदय पुरस्कार, पंडित दीन दयाल उपाध्याय अंत्योदय कृषि पुरस्कार 2021, हलधर जैविक किसान पुरस्कार 2021 और जगजीवन राम अभिनव किसान पुरस्कार 2021 प्राप्त हुआ।

विशेष कार्यक्रम

- दलहनों पर समूह अग्रिम पंक्ति प्रदर्शनों के तहत, कर्नाटक और केरल के कृषि विज्ञान केंद्रों द्वारा किसानों के खेत के 1483.4 हेक्टेयर क्षेत्र में विभिन्न दलहन फसलों, जैसे उड़द, मूँग, अरहर, चना और लोबिया पर कुल 3058 प्रदर्शन आयोजित किए गए।
- तिलहनों पर समूह अग्रिम पंक्ति प्रदर्शनों के तहत, कर्नाटक और केरल के कृषि विज्ञान केंद्रों द्वारा किसानों के 869 हेक्टेयर क्षेत्र में मूँगफली, सोयाबीन, सूरजमुखी, कुसुम, नाइजर, अरंडी, अलसी, सरसों और तिल पर कुल 2005 प्रदर्शन आयोजित किए गए।
- बीज हब कार्यक्रम के तहत आठ कृषि विज्ञान केंद्रों ने 2107.05 किं. दालों के बीज का उत्पादन किया, जिसमें चना (1000.50 किं.), अरहर (684.35 किं.), उड़द (193.63 किं.), मूँग (203.20 किं.), लोबिया (9.65 किं.), फील्ड बीन (12.42 किं.) और कुलथी (3.30 किं.) शामिल हैं।
- राष्ट्रीय जलवायु अनुकूल कृषि पहल (एनआईसीआरए) के तहत, कर्नाटक और केरल में चौदह जलवायु के प्रति संवेदनशील जिलों को शामिल करते हुए जलवायु-अनुकूल गांवों के समूह में बनाने के लिए 1209.8 हेक्टेयर क्षेत्र और

93 इकाइयों को शामिल करने वाली विभिन्न कृषि प्रणाली टाइपोलॉजी में कुल 2122 प्रदर्शन किए गए थे। कर्नाटक के चिक्काबल्लापुरा, गदग, चित्रदुर्ग, कालबुरगी, तुमकूर जिलों और केरल के आलपुष्पा और कण्णूर जिलों में राज्य कृषि विभाग के माध्यम से कुल 137292 हेक्टेयर भूमि को जलवायु-अनुकूल किस्मों के तहत लाया गया है।

- कृषि में युवाओं को आकर्षित करने और बनाए रखने (ARYA) के तहत, विभिन्न कृषि और संबद्ध उद्यमों पर 917 ग्रामीण युवाओं के लिए 62 क्षमता निर्माण कार्यक्रम आयोजित किए गए।
- आईसीएआर-अटारी और इसके कृषि विज्ञान केंद्रों ने 16-31 दिसंबर, 2022 के दौरान स्वच्छता पखवाड़ा मनाया और 20625 प्रतिभागियों की भागीदारी के साथ स्वास्थ्य और स्वच्छता से संबंधित विभिन्न गतिविधियों का आयोजन किया।
- इस क्षेत्र में दस आईसीएआर संस्थानों ने 565 गोद लिए गए गांवों में किसानों और अन्य हितधारकों को शामिल करके वैज्ञानिकों की 126 बहु-विषयक टीमों के गठन के माध्यम से मेरा गांव-मेरा गौरव कार्यक्रम लागू किया।
- जिला कृषि मौसम विज्ञान इकाई (डीएएमयू) के तहत, कृषि विज्ञान केंद्रों ने 3225 कृषि सलाह विकसित की है और वर्ष के दौरान विभिन्न संचार विधियों का उपयोग करके 299345 किसानों तक इसका प्रसार किया है।
- तीन केंद्रों ने फार्मर फर्स्ट कार्यक्रम को लागू करना जारी रखा और फसल, बागवानी, पशुधन, प्राकृतिक संसाधन प्रबंधन, उद्यम और एकीकृत कृषि प्रणाली मॉड्यूल में क्षेत्र स्तर पर कई परीक्षण किए। इस कार्यक्रम के तहत 23 गांवों/वार्डों के कुल 5438 परिवार लाभान्वित हुए।
- इस क्षेत्र में कुल 191704 किसानों ने कृषि प्रौद्योगिकी सूचना केंद्रों (एटीआईसी) का दौरा किया। एटीआईसी ने 76064

किसानों को खेती के विभिन्न पहलुओं से संबंधित जानकारी प्रदान की। इस अवधि के दौरान 102379 किसानों ने इन केन्द्रों में उपलब्ध तकनीकी उत्पाद खरीदे।

विस्तार निदेशालय द्वारा प्रौद्योगिकी मदद

- विस्तार निदेशालय ने 44 वैज्ञानिक सलाहकार समिति की बैठकों, 206 प्रक्षेत्र दिवसों, 95 कार्यशालाओं/सेमिनारों, 21 प्रौद्योगिकी सप्ताहों और 792 प्रशिक्षण कार्यक्रमों में भाग लिया। कृषि विज्ञान केंद्रों द्वारा आयोजित 130 प्रक्षेत्र परीक्षणों और 337 अग्रिम पंक्ति प्रदर्शनों का दौरा करके प्रक्षेत्र स्तर की निगरानी की गई।

अनुसंधान परियोजनाएँ

- आईसीएआर-अटारी, बेंगलुरु ने पांच संस्थान अनुसंधान परियोजनाएं शुरू की हैं और आठ राष्ट्रीय नेटवर्क परियोजनाओं में शामिल है।

प्रकाशन

- आईसीएआर-अटारी, बेंगलुरु के वैज्ञानिकों ने शोध पत्र (5) प्रकाशित किए और पुस्तकें/अध्याय (8) संपादित किए। कृषि विज्ञान केंद्रों के कर्मचारियों ने कृषि और संबद्ध उद्यमों के विभिन्न तकनीकी पहलुओं पर 191 शोध पत्र, 149 प्रशिक्षण मैनुअल और तकनीकी बुलेटिन, 306 लोकप्रिय लेख और 305 विस्तार साहित्य प्रकाशित किए।

मानव संसाधन विकास

- दिनांक 11 फरवरी, 2022 को ऑनलाइन माध्यम से कृषि विश्वविद्यालय, बेंगलुरु के सहयोग से आईसीएआर-अटारी, क्षेत्र-XI ने "कर्नाटक के एफपीओ के लिए प्रौद्योगिकी मदद" पर एक दिवसीय कार्यशाला का आयोजन किया। कृषक उत्पाद संगठन और कृषि विज्ञान केंद्र से कुल 150 प्रतिभागियों ने इस कार्यक्रम में भाग लिया।



Executive Summary

The ICAR-ATARI Bengaluru, Zone XI has 48 KVKs under its operational jurisdiction of which 33 in Karnataka, 14 in Kerala and one in Lakshadweep these KVKs are under the administrative control of different host organizations viz., SAUs (33 KVKs), NGOs (8 KVKs) and ICAR Institutes (7 KVKs).

The mandate of KVK is technology assessment and demonstration for its application and capacity development. It is achieved through on-farm testing, frontline demonstration, capacity development, extension activities and farm advisories, production and supply of technological products thereby serving as the knowledge and resource centre on scientific farming at the district level.

Major Activities at ICAR-ATARI, Bengaluru

Hon'ble Prime Minister Programmes

- The ICAR-ATARI, Bengaluru coordinated live webcasting programs of Hon'ble Prime Minister held on 01 January, 2022, Garib Kalyan Sammelan held on 31 May, 2022 and PM Kisan Samman Sammelan held on 17 October, 2022 for KVKs in Zone XI. Altogether 21723 farmers participated in the live telecast programmes at their respective KVKs in Karnataka, Kerala and Lakshadweep.

Hon'ble Union and State Ministers Programmes

The ICAR-ATARI, Bengaluru coordinated the following programmes:

- Hon'ble Union Minister of State Shri. Bhagwanth Khuba visited KVK, Kollam on 21 August, 2022.
- Live programme of Kisan Bhagidari Prarthamikata Hamari Campaign, as a part of Azadi Ka Amrit Mahotsav by Hon'ble Union Minister and Union State Ministers held on 26 April, 2022 and National Campaign on

Poshan Abhiyan and Tree Plantation, live streaming of the address of the Hon'ble Union Minister for Agriculture and Farmers Welfare, Govt. of India, Shri Narendra Singh Tomar on 17 September 2022.

- Sushri Shobha Karandlaje, Hon'ble Union Minister of State for Agriculture and Farmers Welfare, Govt. of India, New Delhi was involved in the following programs. Laying of Foundation Stone for Farmers Hostel and Staff Quarters at KVK, Belagavi-II on 19 June, 2022; foundation stone for construction of Farmers Hostel at KVK at Ballari and inauguration of seminar on 'Importance of millets and ODOP scheme of Govt. of India in ascertaining nutritional security held on 14 November, 2022; inauguration of workshop on Technologies for Climate Smart Agriculture held at KVK, Pathanamthitta, Kerala on 7 July, 2022; farmers interaction meeting held at Kavaratti Island organized by KVK, Lakshadweep on 2 December, 2022; Special Interaction Programme of FPOs established by KVK, Davanagere held on 14 November, 2022 at Sirigere, Chitradurga, Karnataka.

ICAR programmes

- The ICAR-ATARI, Bengaluru coordinated live webcasting of 94th Foundation Day of Indian Council of Agricultural Research & Awards Ceremony - 2022 held on 16 July, 2022 wherein 3759 farmers and other participants viewed the telecast programme at their respective KVKs in Kerala, Karnataka and Lakshadweep; 12th Biennial National Krishi Vigyan Kendra Conference – 2022 held during 1-2 June, 2022 in which all 48 KVKs of Zone XI took part; and visit of Dr. Trilochan Mohapatra, Secretary, DARE and Director General, ICAR, New Delhi to KVK, Lakshadweep at Kavaratti on 16 April, 2022.

Important days, awareness programmes and special events

- ICAR-ATARI, Bengaluru celebrated its Foundation Day on 01.11.2022 along with

Kannada Rajyotsava wherein all ATARI staff participated. Dr. Mallikarjun B. Hanji, Chief Technical Officer (Computer) and Mrs. Ramola Pinto, Junior Stenographer of the Institute bagged Foundation Day Award 2022 for their best performance.

- During the reporting year, ICAR-ATARI, Bengaluru coordinated different events as a part of Azadika Amrit Mahotsava, through its 48 KVKs viz., international women's day by involving 6747 participants, world pulses day by involving 2011 farmers, international yoga day with 1614 participants, world soil day with the participation of 5099 stakeholders, awareness campaign on efficient and balanced use of fertilizers by involving 3080 farmers, Swatchta Special Campaign 2.0 with 13254 participants, release of special postal cover on Jackfruit products under ODOP by KVK, Pathanamthitta, and Felicitation of Shri Amai Mahalinga Naik, recipient of Padma Shri Award.

Workshops and meetings

- During the reporting year, ICAR-ATARI, Bengaluru coordinated and organized different programmes viz., workshop on technology backstopping to Karnataka FPOs on 11 February, 2022; KVKs Zonal Workshop 2022 during 19 - 22 June, 2022; NICRA Phase-II Launching Cum Annual Review 2021-22 and Annual Action Plan 2022-23 workshop during 13 - 14 June, 2022; Annual review cum action plan meetings of KVKs under Zone-XI (Phase I during 21 to 23 April, 2022; Phase-II during 28 to 30 April 2022, Phase-III during 4 to 6 May, 2022); and Review-cum-ZPMC meeting of Farmer FIRST Programme on 17 August, 2022.

Major Achievements of KVKs

Technology Assessment

- KVKs in the zone conducted 220 OFTs for assessing 494 technologies through 1003 trials by involving 1002 farmers. Out of which,

143 OFTs were by KVKs of Karnataka, 76 OFTs were by KVKs of Kerala and one OFT by KVK Lakshadweep.

- Out of 184 OFTs conducted on crops, 122 OFTs were in Karnataka and 62 OFTs were in Kerala. A total 781 trials were laid for assessing 436 technological options. KVKs of Karnataka assessed 291 technology options through 474 trials and KVKs of Kerala assessed 145 technology options 307 trials.
- In livestock component, KVKs conducted 26 OFTs, out of which 16 were in Karnataka, nine were in Kerala and one in Lakshadweep. This was achieved through 155 trials, which included 79 in Karnataka, 72 in Kerala and four in Lakshadweep. The assessment of 48 technological options included, 33 in Karnataka, 14 in Kerala and one in Lakshadweep.
- Technological options under enterprises were assessed by taking up a total of 10 OFTs by setting up 67 trials, which were spread over 25 in Karnataka and 42 in Kerala.

Frontline Demonstrations

- A total of 5268 FLDs were conducted including 1430 on cereals and millets, 466 on oilseeds, 602 on pulses, 100 on commercial crops, 73 on fibre crops, 119 on fodder crops, 450 on vegetable crops, 70 on tuber crops, 223 on fruit crops, 56 on flower crops, 137 on plantation crops, 251 on spices, 15 on green manure crops, 338 on hybrids of various crops, besides 205 demonstrations on agricultural farm implements, 213 demonstrations on livestock, 163 on fisheries and 367 demonstrations on enterprises in the states of Karnataka, Kerala and Lakshadweep Islands.
- Cereals and millets: KVKs of Karnataka conducted 1116 FLDs on paddy, wheat, sorghum, maize, pearl millet, finger millet, little millet, foxtail millet, brown top millet

in 407.50 ha whereas KVKs of Kerala conducted 314 FLDs on paddy in 139.20 ha.

- Oilseeds, pulses and commercial crops: KVKs of Karnataka conducted 456 FLDs on groundnut, sunflower, niger, castor, mustard, safflower, sesamum and soybean in 155.80 ha whereas KVKs of Kerala conducted 10 FLDs on sesamum in 1.00 ha, 602 FLDs on pulse crops viz., bengalgram, blackgram, fieldbean, greengram, horsegram, pigeonpea and cluster bean in 215.00 ha, 100 FLDs on commercial crops viz., sugarcane, mulberry, betel vine and bamboo in 32.50 ha, 73 FLDs on cotton in 29.40 ha and 15 FLDs on green manuring crop in 6.00 ha.
- Fodder crops: KVKs of Karnataka conducted 100 FLDs on fodder in 18.90 ha whereas KVKs of Kerala conducted 15 FLDs on fodder and moringa as fodder in 0.31 ha and KVK, Lakshadweep conducted 4 FLDs on guinea grass and fodder sorghum in 2.00 ha.
- Vegetable crops: KVKs of Karnataka conducted 343 FLDs on brinjal, cabbage, baby corn, onion, capsicum, cauliflower, chilli, tomato, yard long bean, spinegourd, sweet corn, ridge gourd, french bean, cucumber, drumstick, pole bean, mixed vegetables, nutri-garden in 118.08 ha whereas KVKs of Kerala conducted 107 FLDs on amaranthus, bittergourd, cucumber, frenchbean, okra, yard long bean in 8.56 ha.
- Tuber crops: KVKs of Karnataka conducted 24 FLDs on elephant foot yam, potato, sweet potato in 4.20 ha whereas KVKs of Kerala conducted 46 FLDs on amorphophallus, cassava, sweet potato, taro in 2.98 ha.
- Fruit crops: KVKs of Karnataka conducted 202 FLDs on banana, cashew, custard apple, fig, grape, guava, lime, mango, pomegranate, ajwanin 78.40 ha whereas KVKs of Kerala conducted 21 FLDs on banana in 0.80 ha.
- Plantation crops: KVKs of Karnataka conducted 125 FLDs on coconut, arecanut, coffee in 45.00 ha whereas KVKs of Kerala conducted 12 FLDs on coconut in 1.60 ha.
- Spice crops: KVKs of Karnataka conducted 171 FLDs on black pepper, ginger, turmeric, chilli in 55.50 ha whereas KVKs of Kerala conducted 80 FLDs on black pepper, garlic, ginger, turmeric in 7.18 ha and bush pepper (20 units).
- Flower crops: KVKs of Karnataka conducted 49 FLDs on chrysanthemum, jasmine, marigold, rose, tuberose in 8.40 ha whereas KVKs of Kerala conducted 7 FLDs on marigold in 0.16 ha.
- Demonstrations on hybrids: KVKs of Karnataka conducted 328 FLDs on crops like maize, pearl millet, sweet corn, sunflower, castor, marigold, chilli green, chilli dry, Bt. cotton, tomato, okra, bitter gourd, brinjal, cabbage, cauliflower, cucumber, watermelon, tuberose, dolichos bean in 112.50 ha whereas KVKs of Kerala conducted 10 FLDs on ridge gourd and salad cucumber in 0.40 ha.
- Farm implements/machinery: KVKs of Karnataka conducted 105 FLDs on solar operated nipping machine in chickpea, drying of red chillies in solar and sunlight, manually drawn onion seeder, battery operated onion detopper, soybean spiral separator, tractor operated baler in paddy, rotary mountages for quality cocoon production whereas KVKs of Kerala conducted 100 FLDs on drone technology in paddy, table top screw oil expeller in coconut, power tiller operated coconut basin digger, portable high head sprinkler gun in fodder crops, pedal operated millet dehuller, power operated nutmeg seed sheller, tractor drawn root harvester in turmeric and solar dryer for fruits and vegetables.
- Farm enterprises: KVKs of Karnataka demonstrated 226 home scale farm enterprising units on agroforestry, sericulture, apiculture, compost from seri farm waste, compost, vermicompost and

value addition on mango, ginger, banana, jackfruit, spices, jiggery, tamarind, coconut, millets, chilli, fig, pineapple by involving 627 farmers/farm women and KVKs of Kerala demonstrated various small-scale enterprising units on compost production, integrated farming, mushroom production, EDP on seed production and processing and value addition to jackfruit, fisheries, tapioca, millets, coconut, garcinia, banana, fruit and vegetable and honey by involving 141 farmers/farm women.

- Livestock and fisheries: KVKs of Karnataka conducted 608 FLDs on dairy cow, dairy buffalo, poultry and duckery, piggery, sheep and goat, fisheries by involving 163073 livestock through 151 units whereas KVKs of Kerala conducted 397 FLDs on dairy cow, poultry and duckery, sheep and goat, fisheries by involving 79111 livestock through 232 units and KVK Lakshadweep conducted four FLDs on poultry by involving 40 farmers through 4 units.
- Empowerment of women and children: KVKs of Karnataka organized 474 programmes for 21919 women and 28 programmes for 1529 children whereas KVKs of Kerala organized 283 programmes for 19660 women and 30 programmes for 1255 children.

Capacity Development

- KVKs organized 5,724 capacity development courses which included 3,977 courses for farmers, 580 courses for rural youth and 318 courses for extension personnel. A total of 2,03,641 participants were trained comprising of 1,42,631 farmers, 18,476 rural youth and 12,345 extension personnel. In addition, 661 sponsored and 188 vocational courses were organized.
- Major area of capacity development for farmers was crop production in which 937 courses were conducted involving 35,256 farmers. Capacity development courses on home science/women empowerment (544)

and plant protection (543) were the next most demanded courses followed by livestock production and management (467 courses).

- Rural youth were trained on bio agents' production, Integrated Crop Management, vegetable cultivation, aquaponics, coconut climber and PCRA (116 courses, 4331 participants) and value addition (86 courses, 2681 participants).
- Extension functionaries were trained on capacity building for input dealers, sericulture, nursery management, seed production, disease management in milch animals, post-harvest management, FPOs, natural farming, water management, composting techniques, value addition, processing, Integrated farming system, food safety with 91 courses and 3,700 participants followed by IPM (38 courses, 1,336 participants).
- Sponsored courses (112) were organized on bio fuels, ICM in onion, scientific beekeeping, IFS, energy efficient pump sets and water conservation, Farmers Producer's Organization, friends of coconut tree, RAWE, INM, IMC, DAESI, PMFME, rooftop, Tribal Extension Centre with the participation of 3,771 farmers/rural youth/extension functionaries followed by processing and value addition with 61 programs and 1984 participants.
- Vocational development courses were mostly organized on dairy farming with 21 courses and 802 participants followed by value addition with 20 courses and 376 participants.

Frontline Extension Programmes

- KVKs carried out a total of 1.22 lakh frontline extension activities and created awareness among 13.25 lakh farmers including 1.48 lakh SC/ST farmers and 0.45 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 (493) and popular articles (255) besides newspaper coverage (1763), radio coverage/talks (399), T V coverage/ talks (148) and development of CDs/DVDs/short videos (135).

Production of Technological Inputs

- Produced and supplied 3520.18 q of seeds of different crop varieties, 27.24 lakh planting material of different crop hybrids, 3.96 lakh livestock strains and fish fingerlings benefiting 2.90 lakh farmers.
- Produced and supplied 8012.99 q of bio products through which 1.84 lakh farmers were motivated to adopt bio-control practices by reducing use of chemicals.

Kisan Mobile Advisory Services

- Thirty-one KVKs of the zone sent 15,294 text messages to 3.96 lakh farmers. Messages were related to awareness (5091) followed by crops (4720), livestock (2059), other enterprises (1679), and marketing (880).

Soil, Water and Plant Analysis

- KVKs analysed 36,512 samples of soil, water, plant, and organic manure received from 30,526 farmers belonging to 14,730 villages based on which 5,847 soil health cards were distributed to farmers.
- World Soil Day was celebrated on December 5th, 2022 with a theme “Soils: Where food begins” at 47 KVKs of ATARI Bengaluru with the participation of 3373 farmers, 300 scientists, 122 VIPs and 1292 students participated.

Rainwater Harvesting Units

- Rainwater harvesting and recycling units established in 12 KVKs were utilized to organize 37 capacity development programmes and 40 demonstrations. The

facility was used to produce 2,00,476 planting material for use in KVKs and to provide to farmers. These units were visited by 8,263 farmers and 166 officials and got acquainted with the rainwater harvesting techniques.

Convergence and Linkages of KVKs

- As part of convergence with ATMA, KVKs participated in 956 programmes organized by ATMA and at the same time KVKs organized 553 programmes in collaboration with ATMA.
- Karnataka Renewable Energy Development Limited, Bengaluru; MANAGE, Hyderabad; Sanjeevini-Karnataka State Rural Livelihood Promotion Society, Bengaluru; Rashtriya Krishi Vikas Yojana (RKVY); National Horticultural Mission (NHM); 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 programs and activities.

Doubling of Farmers Income

- A total of 5,193 successful cases of farmers whose income was doubled due to KVK interventions were documented which include 3,648 cases from Karnataka and 1,545 cases from Kerala.

Success Stories and Cases of Large-Scale Adoption

KVKs have documented many success stories based on the performance of technologies in terms of enhancing productivity and augmenting income of farmers during the reporting year. Some of the documented important success stories are:

- Rabi jowar variety-SPV-2217 (KVK, Belagavi-II), Probiotics for optimum post-weaning growth in lambs (KVK, Bengaluru Rural), Ginger Candy - a little but something for everyone (KVK, Bidar), Smt. Sakamma – A Millet Entrepreneur (KVK, Mandya), Drip laterals rolling device by Amaresh

Sharanappa Kote (KVK, Raichur), BRG-3 – redgram variety resistant to wilt and sterility mosaic (KVK, Ramanagara), FPO- Udupi Kalparasa Coconut and All Spice Producer's Company (UKCAAS) (KVK, Udupi), Sheep farming: A Boon to the Farmer (KVK, Chikkaballapura), A young woman farmer reaps success through dairy farming (KVK, Alappuzha), Blending taste of coffee with the goodness of mushroom-A novel initiative in agripreneurship (KVK, Kollam), Eco-friendly management of mango orchard (KVK, Palakkad), Ms. Suja - a blooming nursery entrepreneur (KVK, Pathanamthitta).

Awards and Recognition

- KVK Ramanagara received Pandit Deendayal Upadhyay Rashtriya Krishi Vigyan Protsahan Puraskar-2021 and KVK Tumakuru II received 3rd National Water Awards-2020.
- Farmers of the zone received Pandit Deen Dayal Antyoday Puraskar, Pandit Deen Dayal Upadhyay Antyodaya Krishi Puraskar 2021, Halder Organic Farmer Award 2021 and Jagjivan Ram Innovative Farmer Award 2021.

Special Programmes

- Under cluster frontline demonstrations on pulses, a total of 3670 demonstrations on different pulse crops viz., blackgram, greengram, pigeonpea, chickpea and cowpea were conducted by KVKs of Karnataka and Kerala in an area of 1468.00 ha of farmers' field.
- Under cluster frontline demonstrations on oilseeds, a total of 2340 demonstrations on groundnut, soybean, sunflower, safflower, niger, castor, linseed, mustard and sesame were conducted by KVKs of Karnataka and Kerala in 936.00 ha of farmers' field.
- Under seed hub programme eight KVKs produced 2107.05 q seeds of pulses, which included chickpea (1000.50 q), pigeonpea

(684.35 q), blackgram (193.63 q), greengram (203.20 q), cowpea (9.65 q), fieldbean (12.42) and horsegram (3.30 q).

- Under National Innovations in Climate Resilient Agriculture (NICRA), a total of 2122 demonstrations were implemented in different farming system typologies covering 1209.8 ha area and 93 units in order to build climate resilience in cluster of villages covering fourteen climate vulnerability districts in Karnataka and Kerala. A total of 137292 ha have been brought under climate resilient varieties through state department of agriculture in Chikkaballapura, Gadag, Chitradurga, Kalaburagi, Tumakuru, Alapuzha and Kannur districts of Karnataka.
- Under Attracting and Retaining Youth in Agriculture (ARYA), 62 capacity building programs were organized for 917 rural youth on various agricultural & allied enterprises.
- The ICAR-ATARI and its KVKs observed Swachhta Pakhwada during 16-31 December, 2022 and organized various activities related to cleanliness, health and hygiene with the participation of 20625 participants.
- Ten ICAR institutes in the Zone implemented Mera Gaon-Mera Gaurav programme through formation of 126 multidisciplinary teams of scientists by involving farmers and other stakeholders in 565 adopted villages.
- Under District Agricultural Meteorological unit (DAMU), KVKs have developed 3225 agro advisories and disseminated to 299345 farmers using various communication methods during the year.
- Three centers continued to implement the Farmer FIRST programme and implemented several interventions at the field level in crop, horticulture, livestock, natural resource management, enterprise and integrated farming system modules. A total of 5438 households in 23 villages/wards were benefited under this programme.

- A total of 191704 farmers visited Agriculture Technology Information Centers (ATICs) in the Zone. ATICs provided information related to various aspects of farming to 76064 farmers. The technological products available in these centers were purchased by 102379 farmers during the period.

Technological Backstopping by Directorate of Extension

- Directors of Extension participated in 44 scientific advisory committee meetings, 206 field days, 95 workshops/seminars, 21 technology weeks and 792 training programs. Field level monitoring was done by visiting 130 on farm trials and 337 plots of frontline demonstrations conducted by the KVKs.

Research Projects

ICAR-ATARI, Bengaluru has undertaken five Institute Research Projects and associated in eight National Network Projects.

Publications

- Scientists of ICAR-ATARI, Bengaluru published research papers (5) and edited books/ chapters (8). KVK staff published 191 research papers, 149 training manuals and technical bulletins, 306 popular articles and 305 extension literatures on various technological aspects of agriculture and allied enterprises.

Human Resource Development

- One day workshop on “Technology Backstopping to Karnataka FPOs” was organized by ICAR-ATARI, Zone XI in collaboration with University of Agricultural Sciences, Bengaluru through on-line mode on February 11, 2022. A total of 150 participants from FPOs and KVKs have participated in the programme.



Chapter - 1

About ICAR – Agricultural Technology Application Research Institutes

The office of ICAR-ATARI, Bengaluru is located in Hebbal, Bengaluru. The institute has established 48 KVKs of which 33 KVKs in Karnataka, 14 KVKs in Kerala and one KVK in Lakshadweep under different host organizations such as SAUs, ICAR institutes and NGOs.

This chapter consists of following heads:

- 1.1 Mandate
- 1.2 ICAR-ATARI, Zone XI, Bengaluru
- 1.3 Major activities
- 1.4 Budget



1. About ICAR - Agricultural Technology Application Research Institutes

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 Agricultural Universities (SAUs), State Government Departments and Non-

Governmental Organizations (NGOs) with the financial support of Government of India. The Agricultural Extension Division headed by the Deputy Director General (Agricultural Extension) monitors and reviews the KVKs through 11 ICAR-Agricultural Technology Application Research Institutes (ATARIs) established in the country. The jurisdiction of ICAR-ATARIs is illustrated in Table 1.

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

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

1.1 Mandate

The mandate of ICAR-ATARIs 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.

1.2.2 Staff

Sanctioned staff strength of ICAR-ATARI, Zone -XI, Bengaluru is 18, out of which 11 are currently filled (Table 2).

Table 2: Staff strength of ICAR-ATARI, Zone XI, Bengaluru as on 31 December, 2022

Category	Sanctioned (No.)	Filled (No.)
Director (RMP)	1	1
Scientific	6	5
Technical	2	2
Administrative	8	3
SSS (Gr-II)	1	0
Total	18	11

1.2.3 Organizational structure

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

1.3 Major activities

The ICAR-ATARI, Bengaluru coordinated as well as conducted various activities through KVKs in Zone XI during the period under report. Major activities are briefed here under:

1.3.1 Hon'ble Prime Minister Programmes

- (a) Live webcasting of Hon'ble Prime Minister held on 01 January, 2022 at 12.30 pm wherein 45 KVKs of Zone XI (32 from Karnataka, 12 from Kerala and one from Lakshadweep) actively took part in the event and viewed the live programme along with 2147 farmers of which 1654 farmers were from Karnataka, 465 farmers were from Kerala and 28 farmers were from Lakshadweep.
- (b) Garib Kalyan Sammelan held on 31 May, 2022 at Shimla, Himachal Pradesh wherein Hon'ble

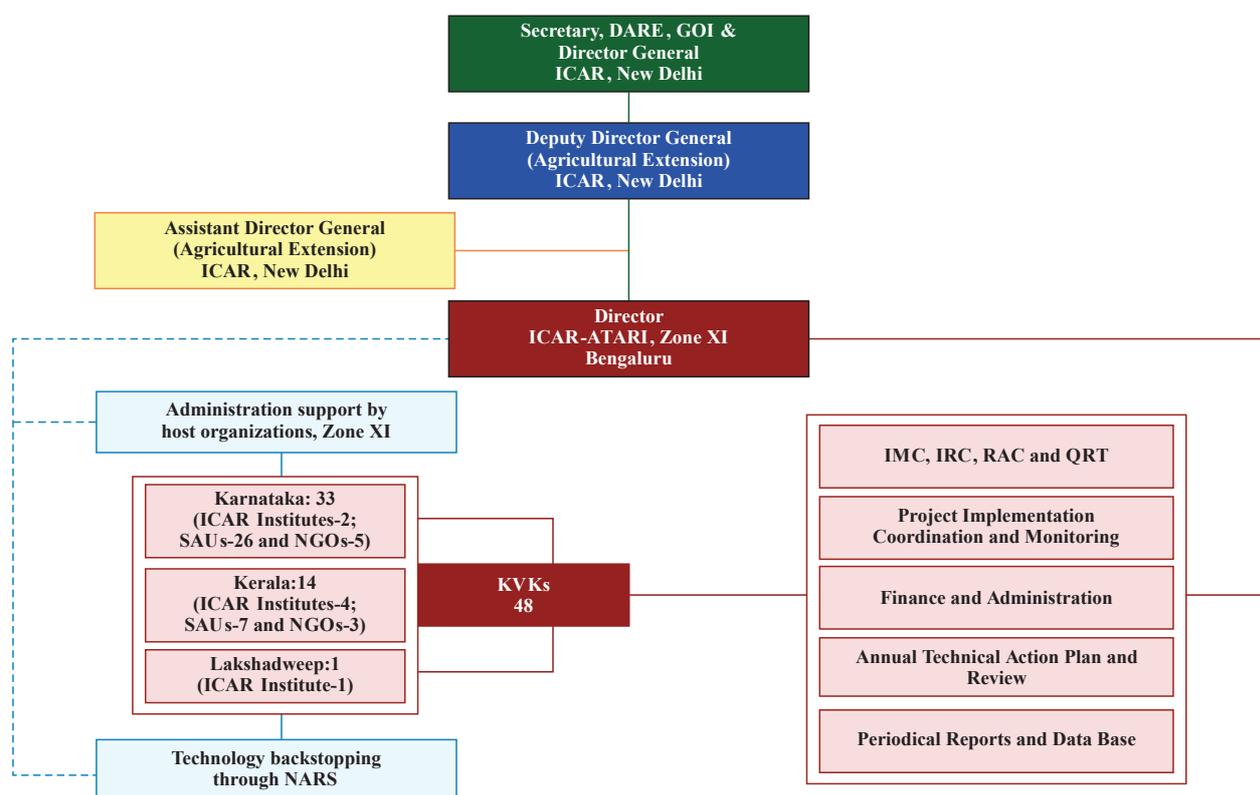


Fig 1: Organizational structure of ICAR-ATARI, Zone-XI, Bengaluru

Prime Minister addressed the participants and also interacted with the beneficiaries of PM-KISAN across the country through live-webcasting. A total of 13153 beneficiaries, farmers and other participants viewed live telecast programme at their respective KVKs of Karnataka, Kerala and Lakshadweep. The Sammelan conceptualizes the elected public representatives across the country directly interacting with the public to get feedback about the various welfare programmes being run by the Government.

(c) In the PM Kisan Samman Sammelan held at Indian Agricultural Research Institute, New Delhi on 17 October, 2022, Hon'ble Prime Minister interacted with the beneficiaries of PM-KISAN across the country through live-webcasting. A total of 6423 participants viewed the live telecast programme at their respective KVKs of Karnataka, Kerala and Lakshadweep which included the presence of two Central Ministers, five MPs, five State Ministers, ten MLAs and 5464 farmers.



Live webcast on 01.01.2022



Live webcast on 31.05.2022



KVK, Chikkamagaluru



KVK, Gadag



KVK, Thrissur



KVK, Kasaragod



Live webcast on 17.10.2022



KVK, Kodagu



KVK, Idukki

1.3.2 Hon'ble Union and State Ministers Programmes

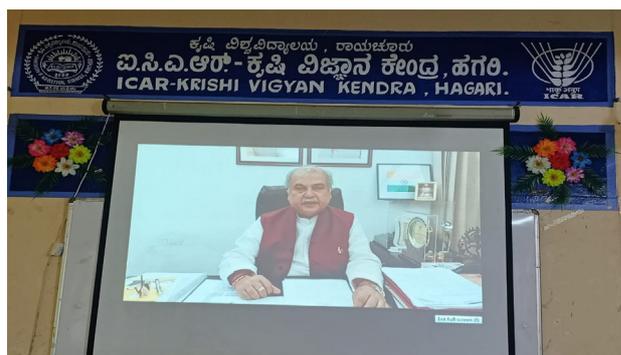
(a) Hon'ble Union Minister of state Shri. Bhagwanth Khuba visited KVK, Kollam onIn his special address, Hon'ble Minister stressed the role of ICAR institutes, SAUs, and KVKs in the growth of the agricultural sector and the welfare of farmers. KVK Times Volume 1 Issue 26 (July 16-31) 2022 compiled and edited by KVK Kollam-an initiative of ICAR ATARI Bengaluru for facilitating the dissemination of valuable

wealth of knowledge from the 48 KVKs of Karnataka, Kerala and Lakshadweep was released by Hon'ble Minister on the occasion.

(b) Kisan Bhagidari Prarthamikata Hamari Campaign, as a part of Azadi Ka Amrit Mahotsav, was inaugurated by Hon'ble Union Minister and Union State Ministers for the farmers and farm women across the country on 26 April, 2022. After launching programme, special lectures on natural farming, millet cultivation and value addition, bio-fortified crops, oilseed production and kisan credit cards were arranged. During this event, 48 KVKs of Zone XI organised Kisan Melas and exhibitions in collaboration with Department of Agriculture and other departments. The programme was attended by nine Members of Parliament and 12 Member of Legislature of state assemblies including participation of Sri.P.Prasad, Hon'ble Minister of Agriculture, Govt. of Kerala at KVK Alappuzha. A total of 12847 farmers participated in the event along with 876 other dignitaries including presidents and members of local panchayats and other officials from line departments like agriculture and allied sectors.

(c) As a part of National Campaign on Poshan Abhiyan and Tree Plantation, live-streaming of the address of the Hon'ble Union Minister for Agriculture and Farmers Welfare, Govt. of India, Shri Narendra Singh Tomar was arranged on 17 September 2022. A total of 45 KVKs of Zone XI organized the event with the participation of 3880 farmers, 253 officials, one MP and five state ministers/MLAs and 219 other public representatives. During the event, 5823 plant saplings and 3969 vegetable seed packets were provided to the farmers.

(d) Sushri Shobha Karandlaje, Hon'ble Union Minister of State for Agriculture and Farmers Welfare, Govt. of India, New Delhi laid Foundation Stone for Farmers Hostel and Staff Quarters at KVK, Belagavi-II on 19 June, 2022. Hon'ble Minister also laid down the Foundation Stone for construction of Farmers



Address of Hon'ble Union Minister Shri Narendra Singh Tomar on the occasion of National Campaign on Poshan Abhiyan and Tree Plantation

Hostel at KVK, Ballari on 14.11.2022. Further, Hon'ble Minister Inaugurated a Seminar on 'Importance of millets and ODOP scheme of Govt. of India in ascertaining nutritional security'. She highlighted the initiatives of Govt. of India for doubling farmers income and in nurturing agri start-ups.

- (e) Sushri Shobha Karandlaje, Hon'ble Union Minister of State for Agriculture and Farmers Welfare, Govt. of India, New Delhi visited KVK, Pathanamthitta, Kerala on 7 July, 2022 and inaugurated the workshop on Technologies for Climate Smart Agriculture wherein she stated that opportunities for earning additional income should be exploited by timely export of agricultural products. Hon'ble Minister also visited KVK, Lakshadweep on 2 December, 2022 and reviewed the activities carried out in the Lakshadweep Islands. She inaugurated the exhibition organized for showcasing the KVK programmes and income generation activities of KVK Self



Foundation stone of farmers hostel laying by Hon'ble Minister Sushri Shobha Karandlaje at KVK, Belagavi-II



National Campaign on Poshan Abhiyan and Tree Plantation (KVK, Kalaburagi-I)

Help Groups. Hon'ble MoS participated in the farmers interaction meeting organized by ICAR-KVK at Kavaratti Island. During the inaugural speech, the Minister stressed on the importance of forming more Farmer Producers Organization (FPO) in promoting the value added products related to coconut and fish.

- (f) Sushri Shobha Karandlaje, Hon'ble Union Minister of State for Agriculture and Farmers Welfare, Govt. of India, New Delhi participated in Special Interaction Programme of FPOs established by KVK, Davanagere held on 14.11.2022 at Sirigere, Chitradurga, Karnataka. Hon'ble Minister Sushri Shobha Karandlaje visited the exhibition where processed and packaged products of the farmers' producer companies were displayed. The shareholders discussed the problems faced by the farmers' producer companies in the initial stages and the progress to be made in the coming years.



Foundation stone of staff quarters laying by Hon'ble Minister Sushri Shobha Karandlaje at KVK, Belagavi-II



Hon'ble Minister Sushri Shobha Karandlaje inaugurating workshop at KVK, Pathanamthitta



Hon'ble Minister Sushri Shobha Karandlaje visiting exhibition at KVK, Pathanamthitta



Hon'ble Minister Sushri Shobha Karandlaje inaugurating exhibition at KVK, Lakshadweep



Hon'ble Minister Sushri Shobha Karandlaje addressing at KVK, Lakshadweep



Hon'ble Minister Sushri Shobha Karandlaje visiting exhibition at KVK, Lakshadweep



Hon'ble Minister Sushri Shobha Karandlaje released publications at KVK, Lakshadweep



Foundation stone of farmers hostel laying by Hon'ble Minister Sushri Shobha Karandlaje at KVK, Ballari



Hon'ble Minister Sushri Shobha Karandlaje inaugurating seminar at KVK, Ballari



Hon'ble Minister Sushri Shobha Karandlaje visiting exhibition at Sirigere, KVK, Davanagere



Hon'ble Minister Sushri Shobha Karandlaje interacting with FPOs at Sirigere, KVK, Davanagere

1.3.3 ICAR programmes

(a) The 94th Foundation Day of Indian Council of Agricultural Research & Awards Ceremony - 2022 held at the National Agricultural Science Centre Complex, New Delhi on 16.07.2022 was inaugurated by Union Minister of Agriculture & Farmers' Welfare Shri Narendra Singh Tomar, wherein he said that the farmers' trust in the Krishi Vigyan Kendras is really a matter of pride for the Council. The Krishi Vigyan Kendras pan India

also arranged the live-webcasting of the event and Hon'ble Union Minister virtually interacted with the various successful farmers during the occasion. A total of 3759 farmers and other participants viewed the telecast programme at their respective KVKs of Kerala, Karnataka and Lakshadweep. Dr. Trilochan Mohapatra, Secretary (DARE) & Director General (ICAR) highlighted the Council's achievements made during the preceding year. Prof. Ramesh Chand, Member, NITI Aayog also applauded the landmarks achieved by the Council in the development of various technologies for the agricultural and farming communities.

(b) Two-day 12th Biennial National KrishiVigyan Kendra Conference - 2022 on Sustainable Agricultural Production System was jointly organized by Indian Council of Agricultural Research, New Delhi and Dr.Yashwant Singh Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh during 1-2 June, 2022. Shri Narendra Singh Tomar, Union Minister of Agriculture & Farmers' Welfare inaugurated the conference. In his address, he said that the Krishi Vigyan Kendras and Krishi Vishwavidyalaya play an important role in ensuring the best agricultural practices and realizing the vision of Aatma Nirbhar Bharat in the country. All 48 KVKs of Zone XI participated in the conference and Technical Sessions held during the conference.

(c) Dr. Trilochan Mohapatra, Secretary, DARE and Director General, ICAR, New Delhi visited KVK, Lakshadweep at Kavaratti on 16 April, 2022. During the visit, a Farmer's Meet was organized



Address of Hon'ble Union Minister Shri Narendra Singh Tomar during 94th Foundation Day of ICAR



94th Foundation Day of ICAR (KVK, Palakkad)



94th Foundation Day of ICAR (KVK, Thrissur)



A view of exhibition stall put up by KVKs of ICAR-ATARI, Bengaluru

which was attended by 50 progressive farmers along with the officials of the UT Administration of Lakshadweep. Addressing the gathering, Dr. Trilochan Mohapatra stated that seaweed culture, value addition and processing of coconut and fish are the three important areas for improving entrepreneurship in the Islands. During the meet, farmers, entrepreneurs, promoters of new FPOs formed and beneficiaries of TSP-ICAR-CMFRI were felicitated by Dr. Trilochan Mohapatra. Prior to the Farmer’s Meet, Dr. Trilochan Mohapatra visited the District Agro Meteorological Unit established by KVK, Lakshadweep at Kavaratti. He suggested that the data generated from the unit should be validated and disseminated to all Islands. Innovative methods for dissemination of such information should be attempted. An interface meeting between the ICAR and officials of the UT Administration of Lakshadweep was chaired by Dr. Trilochan Mohapatra which was attended by Mr. Amith Satija, Secretary (Finance), Mr. Shashank Mani Tripathy, Secretary (Agriculture) and Mr. Santhosh Kumar Reddy, Special Secretary (Agriculture) of the UT Administration of Lakshadweep.



Address of Secretary, DARE and Director General, ICAR, New Delhi



Felicitating of women entrepreneur



Secretary, DARE and Director General, ICAR, New Delhi visiting DAMU



Interaction meeting chaired by with Secretary, DARE and Director General, ICAR, New Delhi

1.3.4 Important days, awareness programmes and special events

(a) ICAR-ATARI, Bengaluru celebrated its Foundation Day on 01.11.2022 along with Kannada Rajyotsava wherein all ATARI staff participated. Dr. V. Venkatasubramanian, Director while proposing welcome, highlighted the achievements of ICAR-ATARI, Bengaluru and appreciated the contribution of KVKs for upliftment of farming community. Dr. S. Rajendra Prasad, Former Vice Chancellor, University of Agricultural Sciences, Bengaluru inaugurated the Institute Foundation Day as Chief Guest. In his address, he appreciated the ICAR-ATARI achievements and said that ATARI can support farmers to face the difficult climatic situations through the network of KVKs. He underlined that ATARI can influence the farmers to double their income through transfer of viable technologies from research institutes to farmers' fields. He also talked about Kannada literature and remembered the people who have contributed towards the development of Kannada language. Dr. Ramesh Rao Narayana, Astro medicine scientist, graced the occasion as Guest of Honour. In his address, he briefed on the difference

between the matter and non-matter concepts. He explained about his research on time as a variable and stated that if time changes, the quality of energy changes. Dr. Mallikarjun B. Hanji, Chief Technical Officer (Computer) and Mrs. Ramola Pinto, Junior Stenographer of the Institute bagged Foundation Day Award 2022 for their best performance during the year 2021.

(b) Celebration of international women's day, as part of Azadi ka Amrit Mahotsava, was coordinated on 8 March 2022 in Zone XI by 33 KVKs in the zone. Wherein, 54 events were organized which includes seven seminars, 35 trainings, three goshties and three exhibitions by involving 6747 participants. Women entrepreneurs shared their success stories in processing and value addition enterprises. Further, KVKs have felicitated farm women for their outstanding contribution in vegetable and horticultural crop production, organic farming, dairy management, processing and value addition.

(c) Celebration of world pulses day, as a part of Azadi ka Amrit Mahotsav, was coordinated on 10 February, 2022 in Zone XI by 37 KVKs. The KVKs conducted 49 events, which includes 14 seminars, 19 trainings, 13 goshties and three exhibitions



Inauguration and presentation of certificates



View of activities

with the participation of 2011 farmers to create awareness on importance of pulses. Further, various farmer awareness programmes and new technological advances showcased for enhancing productivity and profitability of agriculture and allied sectors. Progressive farmers who have successfully adopted latest technologies and made contribution to wide scale adoption of technologies were felicitated by the KVKs on the event.

(d) Celebration of international yoga day was coordinated on 21 June, 2022 in Zone XI by 24 KVKs from Karnataka and Kerala by involving 1614 participants which includes farmers, officials and other stakeholders. Yoga Experts, Medical Officers from Naturopathy and Yogic Sciences Institutes were also invited to speak on the importance of yoga in daily life. Yogic exercises were taught for the participating farmers and farm women under the guidance of experienced yoga teachers. They also created awareness on region specific agro-forestry during the occasion to reduce the risk of climatic vulnerability in cultivation of field crops.

(e) Celebration of world soil day was coordinated on 5 December, 2022 by all the 33 KVKs of Karnataka and 14 KVKs of Kerala wherein 5099 stakeholders participated of which 3573 were farmers/farm women, 300 Scientists, 1292 students and 122 VIPs. MLAs, large number of people's representatives of panchayats and senior level government officials were also present. Technical sessions were organized on different topics like natural farming, soil health card, and importance of the soil in farming.

(f) Awareness campaign on efficient and balanced use of fertilizers was coordinated on 21 June, 2022 among 40 KVKs of Zone XI wherein 3080 farmers, 35 VIPs and public representatives participated. During the campaign, topics on use of organic manures, green manure, organic inputs, bio-fertilizers, soil test based nutrient application, and nano-fertilizer for various crops were covered.

(g) Special Campaign 2.0 was coordinated from 2 - 31 October, 2022, with a focus on "Swachhata (cleanliness) and reducing pendency in government" among all 48 KVKs of Zone XI wherein organized a total of 494 activities by involving 13254 participants who were given exposure to different topics like Microbial based agricultural waste management, vermicomposting, crop residue management, wealth from waste technologies, hygiene, sanitation and cleanliness.

(h) Special postal cover on Jackfruit products was released by Shri. K. K. Devis, Director of Postal Services, Circle Office Thiruvananthapuram and handed over it to Dr. C. P Robert, Senior Scientist and Head, KVK, Pathanamthitta on 15.11.2022 under One District One Product (ODOP) Scheme. Jackfruit is the ODOP crop of Pathanamthitta district of Kerala. The release is a recognition for the pioneering efforts made by ICAR- KVK, Pathanamthitta for the transformation of Jackfruit from the most "wasted fruit" to the 'State fruit' of Kerala.

(i) The ICAR-ATARI, Bengaluru felicitated the Tunnel Man of Karnataka Shri. Amai Mahalinga Naik, recipient of Padma Shri Award in the reporting year during SAC meeting of KVK, Dakshina Kannada held on 31 January, 2022 wherein 58 farmers, officers from various Institutions, students and KVK staff were participated. Shri. Amai Mahalinga Naik (Age 77 Years), an Innovative Farmer from Adyanadka village of coastal Dakshina Kannada District of Karnataka has transformed an arid sloping hill into a fertile farm through an Innovative Zero-Energy Micro-Irrigation System. He is known as "One-Man Army" and "Tunnel Man" in his neighbourhood. He turned a deserted and barren plot of land into a lush oasis supporting 300 arecanut palms, 75 coconut trees, 150 cashew trees, 200 banana saplings and pepper vines. In addition to this, he also keeps bees and produces azolla for his cows as a dietary supplement. Shri. Naik's farm has become a model-farm and has over 1,000 visitors every year including the foreign tourists.



International women's day (KVK, Kodagu)



World pulses day (KVK, Dakshina Kannada)



International yoga day (KVK, Bengaluru Rural)



World soil day (KVK, Palakkad)



Awareness campaign on efficient and balanced use of fertilizers (KVK, Thrissur)



Special Swachhata Campaign 2.0 (KVK, Tumakuru-II)



Special Postal cover release on Jackfruit products (KVK, Pathanamthitta)



Padma Shri Awardee Amai Mahalinga Naik, felicitated

1.3.5 Workshops and meetings

(a) Workshop on technology backstopping to Karnataka FPOs : The ICAR-ATARI, Bengaluru in collaboration with UAS, Bengaluru organized one-day workshop on Technology Backstopping to Karnataka FPOs virtually on 11 February, 2022. FPO members and KVK scientists participated in the workshop. Dr. V. Venkatasubramanian, Director, ICAR-ATARI, Bengaluru gave welcome wherein he emphasized the need and importance of FPOs for remunerative agriculture. The Chief Guest Dr. A. K. Singh, Deputy Director General (Agricultural Extension), ICAR, New Delhi in his speech highlighted the Prime Minister's ambitious programme of forming 10000 FPOs across the country. The Guest of Honour Dr. Rajendra Prasad, Vice Chancellor, UAS, Bengaluru in his speech suggested that each KVK need to adopt one FPO to transfer available technologies, KVKs to act as knowledge partner and provide all technology inputs starting from production till processing and export linkages to market their products. KVKs also to explore the possibilities of linking FPOs to MSME and Atma Nirbar Bharat programs.

Five different product-based technology lectures viz, technology for coconut-based products from ICAR-CPCRI, Kasaragod, technology for horticulture-based products from ICAR-IIHR, Bengaluru, technology for millet-based products from ICAR-IIMR, Hyderabad, technology for fish-based products from ICAR-CIFT, Cochin and technology for animal-based products from SRS, ICAR-NDRI, Bengaluru were organized during the technical sessions of the Workshop. Mr. Subbaya, Chairman, Puthari Farmer Producer Company Limited, Kodagu, Mr. Satyanarayana, C&MD, Udipi Kalparasa Coconut and All Spices Producer Company Limited, Udipi and Mrs. Allwinn, Tulunadu Ecogreen Farmers Producer Company Limited, Kasaragod shared their FPO success and achievements.

(b) KVKs Zonal Workshop 2022: ICAR-ATARI, Bengaluru in collaboration with UAS, Dharwad organized KVKs Zonal Workshop 2022 from 19 to 22 June, 2022 with a theme "Strengthening IFS through appropriate technologies along with organic

and natural farming practices". Sushri Shobha Karandlaje, Hon'ble Minister of State for Agriculture & Farmers Welfare, Government of India inaugurated the workshop. In her inaugural address, she expressed that the India has an opportunity to emerge as a global player in export of agricultural produces, and advised to rely on natural and organic farming in a phased manner. Three publications entitled 'Achieving Food, Nutrition and Livelihood Security-KVKs from Karnataka, Kerala and Lakshadweep', 'One District One Product - A strategic document by KVKs' and 'Technology Inventory from ICAR Institutes for KVKs', and registered exclusive logo for KVK products 'KISAN SAMRIDDHI' and a KVK app to sell the products of KVKs and farmers "KVK KISAN KART" were released by Hon'ble Minister Sushri Shobha Karandlaje during the inaugural function. During the occasion, Shri Shree Padre, farm journalist cum campaigner on Rainwater Harvesting and Smt. Sushomma, entrepreneur were honoured with Kisan Samriddhi Award 2022 and Best Women Entrepreneur Award 2022, respectively.

Hon'ble Agriculture Minister, Government of Karnataka Shri B. C. Patil said that state government is making all efforts to make agriculture a business by creating separate department called secondary agriculture first time in the country. He advised the agriculture students (agriculture graduates) to become job providers instead of job seekers. Dr.T. Mohapatra, Secretary, DARE and DG, ICAR during his virtual keynote address emphasised that diversification is necessary in agriculture to overcome the problems due to climate change and improve the sustainability in agriculture. Dr.A.K. Singh, DDG (AE), ICAR in his online address stressed on the steps to be taken towards doubling of farmers' income and said that the workshop is planned to strengthen the Integrated Farming System through organic and natural farming to come out with the strategies to increase farmers income.

The filed visit to experience different integrated farming system and natural farming models adopted by farmers, interaction with promoters of FPO Kadamba Cooperative Limited, Sirsi under the guidance of KVK Uttara Kannada was arranged on the second day. On third day started

with celebration of International Yoga Day followed by release of “Hand book on Processing and Value Addition to Fruits and Vegetables” by Dr. G.R. Chintala, Chairman National Bank for Agriculture and Rural Development, (NABARD) Mumbai and his interaction with delegates from KVKs. The field visit to KVK Belgaum-II and KVK Kolhapur-II including visit to Gaushala, lakhpatikhethi model, natural farming practices and demonstration unit on indigenous cattle and cow based value added products were organized. On fourth day, visit to ICAR-IIPR RRS, Dharwad and lecture on ‘Production technologies for crop rotation in IFS’ was arranged. Dr. Ashok Narula, Former Director, ICAR-ATARI, Ludhiana delivered a lecture on ‘Strengthening of KVK System based on QRT Recommendations’ and Dr. S. Prabhukumar, Former Director, ICAR-ATARI, Bengaluru and Ludhiana delivered a lecture on ‘Documentation of success stories, case studies and data analysis’.

The valedictory session was held on June 22, 2022 under holy presence of Pujyashri Adrishya

Kadsiddheshwar Swamiji, Shri Kshetra Siddhagiri Mahasansthan, Kaneri, Kolhapur. He said that cultivable soil of our country has deteriorated due to the use of unscientific chemicals and fertilizers. Hence, increasing soil fertility is very important. Swamiji exhibited products produced by the farmers and marketed under the brand name Siddhagiri Naturals. He expressed that similar kind of activity can be taken up by all KVKs to help the farmers sell their value added products. ADG (AE), ICAR, New Delhi, Dr.Randhir Singh Poswal in his valedictory remarks said that, the farmers income can be increased by reducing input cost, increasing production and productivity. Hon’ble Vice-Chancellor, UAS, Dharwad Dr. M. B. Chetti in his presidential remarks said that agriculture can be made profitable when farmers involve themselves in farming. Directors of Extension from all Agricultural Universities and Heads of all KVKs from Karnataka, Kerala and Lakshadweep were present. Director, ICAR-ATARI, Bengaluru, Dr. Venkatasubramanian welcomed the guests and Director of Extension, UAS, Dharwad Dr. I. S. Katageri proposed the vote of thanks.



Hon’ble Union Minister of State inaugurating and addressing



Address by Shri B. C. Patil
Hon’ble Agriculture Minister
Government of Karnataka



Dr.T. Mohapatra, Secretary,
DARE and DG, ICAR



Dr.A.K. Singh, DDG (AE), ICAR



Presentation of Kisan Samridhi Award 2022 and Best Women Entrepreneur Award 2022



Release of publications and logo 'KISAN SAMRIDDI'



Visit to KVK, Uttar Kannada



Visit to KVK, Kolhapur



Visit to KVK, Belagavi



A view of participants



Valedictory session

(c) Launching of Phase-II of NICRA in Zone XI : ICAR-ATARI, Bengaluru organized NICRA Phase-II Launching Cum Annual Review 2021-22 and Annual Action Plan 2022-23 workshop in collaboration with CRIDA, Hyderabad at Bengaluru from 13 to 14 June, 2022. Dr Vinod Kumar Singh, Director, ICAR-CRIDA, Hyderabad formally launched implementation of the phase-II of NICRA in the KVKs of ATARI, Bengaluru. Dr. M. Jayashree Krishankutty, DE, KAU, Kerala; Dr. K Narayana Gowda, DE, UAS, Bengaluru; and Dr. B. Hemla Naik, DE, UAHS, Shivamogga shared their work experiences as well as the benefits attained by the farmers on adoption of various climate resilient technologies in the existing TDC-NICRA-KVK villages. Dr. V. Venkatasubramanian in his address necessitated to focus more on the identification of climate constraints of the new TDC-NICRA-KVK villages for demonstration of need-based technologies to minimize the risk of extreme events. Dr. R. H. Laxman, Principal Scientist, ICAR-IIHR, Bengaluru, Dr. Kandiannan, Principal Scientist, ICAR- IISR, Calicut and Dr. G Byju, Principal Scientist, ICAR-CTCRI, Thriuvanthapuram presented important potential climate resilient technologies. Dignitaries and participants visited the TDC-NICRA-KVK village, D Nagenahalli, Tumukur district of Karnataka and interacted with farmers who adopted interventions of resilient practices. On the second day of the workshop, all 14 NICRA-KVKs of Karnataka, Kerala and Lakshadweep presented their progress report (2021-22) and Action Plan (2022-23) before the expert panellists. Dr. J.V.N.S. Prasad, Coordinator, NICRA, CRIDA, Hyderabad, stated

that each intervention should be planned in relation to climate vulnerabilities like drought, cyclone, salinity, heat stress, and flood. Dr. D.V. Srinivasa Reddy, Principal Scientist and nodal officer of NICRA, ATARI, Bengaluru coordinated the entire programme.

(d) Annual review cum action plan meetings of KVKs under Zone-XI : The annual review cum action plan meetings of 48 KVKs of Zone-XI comprising Karnataka, Kerala and Lakshadweep were conducted in three phases. Phase-I meeting was held at UAS Dharwad during 21 to 23 April, 2022 wherein 16 KVKs viz., Bagalkote, Belagavi-I, Belagavi-II, Dharwad, Gadag, Haveri, Uttara Kannada, Vijayapura-I, Vijayapura-II, Ballari, Bidar, Kalaburagi-I, Kalaburagi-II, Koppal, Raichur and Yadgir presented their progress work for the year 2021-22 and action plan for the year 2022-23 before the experts. Dr. Balachandra Naik, Director of Extension, UAS, Dharwad and Dr. M.J. Chandre Gowda, Principal Scientist, ICAR-ATARI coordinated the meeting. Phase-II meeting was held at KAU, Thrissur during 28 to 30 April 2022 wherein 15 KVKs viz., Alappuzha, Ernakulam, Idukki, Kannur, Kasaragod, Kollam, Kottayam, Kozhikode, Malappuram, Palakkad, Pathanamthitta, Thiruvananthapuram, Thrissur, Wayanad and Lakshadweep presented their progress work for the year 2021-22 and action plan for the year 2022-23 before the experts. Dr. Jayasree Krishankutty, Director of Extension, KAU, Thrissur, Dr. B.T.Rayudu and Dr. D.V.S. Reddy, Principal Scientists of ICAR-ATARI coordinated the meeting. Phase-III meeting was held at UAS,



Launching of Phase-II of NICRA-TDC in Karnataka, Kerala and Lakshadweep



Phase-I meeting at UAS, Dharwad



Phase-II meeting at KAU, Thrissur

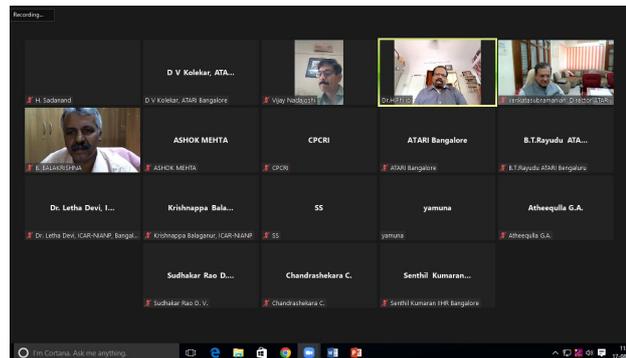


Phase-III meeting at UAS, Bengaluru

Bengaluru during 4 to 6 May, 2022 wherein 17 KVKs viz., Bengaluru Rural, Chamarajanagara, Chikkaballapura, Hassan, Kolar, Mandya, Mysuru, Ramanagara, Tumakuru-I, Tumakuru-II, Chikkamagaluru, Chitradurga, Davanagere, Dakshina Kannada, Kodagu, Shivamogga and Udupi presented their progress work for the year 2021-22 and action plan for the year 2022-23 before the experts. Dr. N. Devakumar, Director of Extension, UAS, Bengaluru and Dr. D.V.S. Reddy, Principal Scientist, ICAR-ATARI coordinated the event.

(e) Review cum ZPMC meeting of Farmer FIRST Programme: ICAR-ATARI, Bengaluru organized online Review cum Action Plan Workshop and Zonal Programme Management Committee (ZPMC) meeting of Farmer FIRST Programme on 17th August, 2022. Dr. V. Venkatasubramanian, Chairman, ZPMC & Director, ICAR-ATARI Bengaluru in his opening remarks, emphasized strengthening of programme by giving more thrust to skill development and

focusing more on natural farming practices and using less external agriculture inputs by *in-situ* conservation of resources and ploughing back their residues into the system to reduce cost and increase profit. He suggested to make field visit to make the programme more successful and focused. Dr. A. K. Mehta, Member ZPMC & Former ADG (AE), ICAR HQ, New Delhi emphasized importance of visiting fields to see what practically is being done and appreciated efforts of the team. Dr. H. Phillip, Member ZPMC & Former Director of Extension, TNAU, Coimbatore also emphasized importance of visiting fields. Shri H. Sadananda & Shri Vijayendra Gurunath Nadajoshi, Farmer representatives & Members ZPMC participated and contributed with valuable feedback. Three implementing centers viz., ICAR-CPCRI, Kasaragod (Regional Station, Kayamkulam), ICAR-IIHR, Bengaluru and ICAR-NIANP, Bengaluru presented the progress for the year 2020-21 and action plan for the year 2022-23. Dr. D.V.Kolekar, Scientist, ICAR-ATARI, Bengaluru coordinated the meeting.



A view of online workshop

1.4 Budget

A total of Rs.10639.33 lakh budget was sanctioned to ICAR-ATARI, Zone-XI, Bengaluru for the year

2022-23 of which Rs.9821.84 lakh was sanctioned for recurring and non-recurring and Rs.817.49 lakh was sanctioned for special programmes. Head-wise details of budget are furnished in Table 3.

Table 3: Head-wise budget of ICAR-ATARI, Zone XI, Bengaluru for 2022-23

Heads	Sanction (Rs. in Lakh)			
	ATARI	KVKs	Support to DEE at SAUs	Total
(A) Recurring				
Pay & Allowance	314.19	7322.47	0.00	7636.66
T.A	24.56	96.51	3.47	124.54
HRD	0.00	0.00	4.35	4.35
Contingencies	59.63	901.15	29.36	990.14
Total (A)	398.38	8320.13	37.18	8755.69
(B) Non Recurring				
Works	0	700.12	0.00	700.12
Furniture & Equipment	8.96	357.07	0.00	366.03
Total (B)	8.96	1057.19	0.00	1066.15
Total (A+B)	407.34	9377.32	37.18	9821.84
(C) Special Programmes				
ARYA	5.92	61.16	0.00	67.08
NICRA	7.68	134.98	0.00	142.66
NFSM	10.03	145.80	0.00	155.83
NMOOP	6.29	99.30	0.00	105.59
FFP	7.00	56.50	0.00	63.50
DAMU	0.00	282.83	0.00	282.83
Total C	36.92	780.57	0.00	817.49
Total A+B+C	444.26	10157.89	37.18	10639.33

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 district level for serving the farmers, farmwomen, rural youth, extension functionaries and other stakeholders through selected agricultural technologies.

The chapter consists of following heads:

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



2. About Krishi Vigyan Kendras (KVKs)

The KVK is the agricultural knowledge and resource centre for farmers, farmwomen, 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

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 in the country. 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
Total	33	08	07	48

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

ICAR - Agricultural Technology Application Research Institute, Bengaluru

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

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

539 (70.18%) 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,

2022,47 KVKs have administrative building, 42 KVKs have farmers hostel, 28 KVK 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

Table 5: State wise and category wise staff strength of KVKs (as on 31.12.2022)

Category	Staff Strength of KVKs (No.)							
	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	1	48	45
Scientists (Subject Matter Specialists)	198	143	84	74	6	1	288	218
Programme Assistants	99	74	42	21	3	0	144	95
Administrative staff	66	38	28	20	2	0	96	58
Drivers	66	42	28	22	2	0	96	64
Supporting staff	66	35	28	23	2	1	96	59
Total	528	362	224	174	16	3	768	539
Filled (%)	68.56		77.68		18.75		70.18	

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	00	47
Farmers hostels	30	12	00	42
Staff quarters	19	09	00	28
Demonstration units	49	31	00	80
Rainwater harvesting units	10	06	00	16
E-connectivity	11	10	00	21
Soil and water testing labs	24	13	01	38
Portable carp hatcheries	04	03	00	07
Minimal processing units	01	02	00	03
Plant health diagnostic labs	09	05	00	14
Four wheelers	33	14	00	47
Two wheelers	63	28	03	94



Administrative building (KVK, Ramanagara)



Administrative building (KVK, Palakkad)



Campus Entrance (KVK, Bengaluru Rural)



Home science laboratory (KVK, Trivandrum)



Training hall (KVK, Gadag)



Demo unit (KVK, Pathanamthitta)

Infrastructure of KVKs in Zone-XI -few cases at a glance

minimal processing unit and 14 KVKs have plant health diagnostic labs and 47 KVKs have four-wheelers. Altogether there are 80 demonstration units and 94 two-wheelers in KVKs.

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. Total 34 KVKs conducted SAC meeting during the reporting period.

2.6 Revolving fund

Revolving fund provided by ICAR is in operation at 46 KVKs of the Zone. KVKs are utilizing revolving fund for production of technological products and the available balance as on 31 December, 2022 was Rs.15.59 crore. Twenty seven KVKs had closing balance of more than Rs.20.00 lakh, eight KVKs had a balance in the range of Rs.10.00 to 20.00 lakh, seven KVKs had closing balance in the range of Rs.4.00 to 10.00 lakh and four KVKs had closing balance less than Rs.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:

- Introduction and up-scaling of improved varieties/hybrids of crops and livestock breeds through technical and quality input back-up.
- Sustainable crop production through integrated nutrient management and organic farming strategies.

- Integrated pest and disease management.
- Development and promotion of crop diversification and alternate land use systems.
- Empowerment of women and youth in terms of improved nutrition, income generation and drudgery reduction through technology 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.



Chapter - 3

Achievements

The ICAR-ATARI Bengaluru is guiding its KVKs in terms of technology and methodology backstopping for implementation of mandated activities through formulation of various technical programs. Further, the ICAR-ATARI is structuring the technical programmes of KVKs through 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 implementing the action plan under the technical guidance of ICAR-ATARI, respective Director of Extension and host organizations.

The chapter consists of following heads:

- 3.1 Kishi Vigyan Kendras
- 3.2 Special Programms
- 3.3 Technical Backstopping by Director of Extension



3.1 Krishi Vigyan Kendras

3.1.1 Technology Assessment

KVKs of ICAR-ATARI, Bengaluru conducted 220 OFTs with 494 technologies through 1003 trials by involving 1002 farmers. State and category wise OFTs are presented in Table 7. In Karnataka, KVKs

carried out 143 OFTs which included 122 on crops, 16 on livestock and five on enterprises by involving 588 farmers. Whereas, KVKs of Kerala conducted 76 OFTs of which 62 on crops, nine on livestock and five on enterprises by involving 410 farmers. One OFT was carried out by KVK Lakshadweep in 4 farmers' fields.

Table 7: Summary of OFTs conducted by KVKs

States/UT	OFTs (No.)	Technologies (No.)	Trials (No.)	Farmers/locations (No.)
Karnataka				
Crops	122	291	474	486
Livestock	16	33	79	81
Enterprises	5	5	25	21
Total	143	329	578	588
Kerala				
Crops	62	145	307	297
Livestock	9	14	72	99
Enterprises	5	5	42	14
Total	76	164	421	410
Lakshadweep				
Crops	0	0	0	0
Livestock	1	1	4	4
Enterprises	0	0	0	0
Total	1	1	4	4
Zone XI				
Crops	184	436	781	783
Livestock	26	48	155	184
Enterprises	10	10	67	35
Grand total	220	494	1003	1002



Assessment of intercropping in maize by KVK, Hassan



Assessment of soybean varieties by KVK, Belagavi II

Karnataka

a. Crop wise technology assessment

KVKs in Karnataka conducted 122 OFTs under different crops. Crop wise details are as follows. Vegetables: A total of 33 OFTs were conducted under thematic areas *viz.*, varietal evaluation (12) followed by IDM (6), INM (6), ICM (2), IPM (2), seed production (2), cropping systems (1), resource conservation (1) and farm machineries (1). Pulses: A total of 18 OFTs were conducted under thematic areas *viz.*, varietal evaluation (12) followed by INM (2), IPM (1), cropping systems (1), drudgery reduction (1) and farm machineries (1). Oilseeds: A total of 17 OFTs were conducted under thematic areas *viz.*, varietal evaluation (14), INM (2), and ICM (1). Commercial crops: A total of 17 OFTs were conducted under thematic areas *viz.*, IPM (7), INM (6), IDM (2), IPDM (1) and farm machineries (1). Cereals: A total of 14 OFTs were conducted under thematic areas *viz.*, varietal evaluation (6), INM (5), IDM (1), cropping systems (1) and value addition (1). Fruit crops: A total of 11 OFTs were conducted under thematic areas *viz.*,

IDM (4), INM (3), IPDM (1), storage techniques (1), value addition (1) and varietal evaluation (1). Plantation crops: Six OFTs were conducted under thematic areas *viz.*, IPM (3), varietal evaluation (2) and resource conservation (1). Fodder crops: Four OFTs were conducted on varietal evaluation. Spices: Two OFTs were conducted on varietal evaluation.

Details on thematic area-wise OFTs conducted by KVKs in Karnataka are provided in **Table 8**. Data indicate that OFTs on different crops were carried out on 13 thematic areas, in which KVKs assessed 291 technological options through 474 trials by involving 486 farmers. More number of OFTs (53) were conducted under the theme varietal evaluation wherein 126 technological options were assessed in 214 farmers' fields. Integrated Nutrient Management was the next major thematic area with 56 technological options tested by involving 96 farmers. Integrated Pest Management (39 technologies) and Integrated Disease Management (28 technologies) were the other major thematic areas where the technology assessment was carried out.

Table 8: Thematic area wise OFTs conducted under crops by KVKs of Karnataka

Thematic areas	OFTs (No.)	Technologies (No.)	Trials (No.)	Farmers/locations (No.)	Area (ha)
Cropping system	3	6	9	9	3.20
Drudgery Reduction	1	3	5	5	2.00
Farm Machineries	3	5	13	13	2.00
Integrated Crop Management	3	5	12	12	1.00
Integrated Disease Management	13	28	56	54	27.60
Integrated Nutrient Management	24	56	84	96	32.35
Integrated Pest Management	13	39	46	44	12.90
IPDM	2	6	7	9	2.20
Resource Conservation Technology	2	7	9	9	0.01
Seed / Plant production	2	4	8	8	0.78
Storage Technique	1	2	2	2	0.00
Value addition	2	4	11	11	6.00
Varietal Evaluation	53	126	212	214	72.98
Total	122	291	474	486	163.02



Assessment of chilli varieties by KVK, Kalaburgi II



Assessment of technological options to manage onion twisting by KVK, Vijayapura I

b. Livestock wise technology assessment:

KVKs in Karnataka conducted 16 OFTs under livestock wherein 33 technologies were assessed in five thematic areas through 79 trials by involving

81 farmers (Table 9). Evaluation of breeds and feed and fodder management (5 OFTs each) were the major thematic areas of technology assessment.

Table 9:Thematic area wise OFTs conducted under Livestock by KVKs of Karnataka

Thematic areas	OFTs (No.)	Technologies (No.)	Trials (No.)	Farmers/ locations (No.)
Disease management	1	2	5	5
Evaluation of breeds	5	9	20	20
Feed and fodder management	5	12	31	33
Nutrition management	3	6	13	13
Production and management	2	4	10	10
Total	16	33	79	81



Assessment of fish breeds by KVK, Belagavi I



Assessment of poultry breeds by KVK, Davanagere

c. Enterprise wise technology assessment

KVKs in Karnataka conducted five OFTs under enterprises with five technologies through 25 trials by involving 21 farmers. Out of which, three OFTs were conducted under the thematic area health and

nutrition with three technology options through 15 trials by involving 15 farmers. Two OFTs were conducted under the thematic area processing and value addition with two technology options through 10 trials by involving six farmers.



OFT on drudgery reduction through drones spraying at KVK, Gadag



OFT on drudgery reduction through solar operated nipping at KVK, Dharwad

Kerala

(a) Crop wise technology assessment

KVKs in Kerala conducted 62 OFTs under different crops. Crop wise details are as follows. Vegetables: A total of 17 OFTs were conducted under thematic

areas viz., varietal evaluation (11), IDM (2), IPM (2), INM (1) and resource conservation (1). Plantation crops: Ten OFTs were conducted under thematic areas viz., varietal evaluation (5), cropping systems (1), ICM (1), INM (1), IPM (1), and resource conservation (1). Cereals: Nine OFTs were conducted under thematic areas viz., varietal evaluation (2), INM (2), weed management (2), IPM (1), farm machineries (1) and value addition (1). Fruit crops: Nine OFTs were conducted under thematic areas viz., varietal evaluation (4), INM (3), cropping systems (1) and value addition (1). Tuber crops: Five OFTs were conducted under thematic areas viz., varietal evaluation (3), ICM (1) and INM (1). Spices: Three OFTs were conducted under thematic areas viz., farm machineries (1), IPM (1) and seed production (1). Pulses: Five OFTs were conducted on varietal evaluation. Commercial crops: Three OFTs were conducted under varietal evaluation. Oilseeds: One OFT was conducted under varietal evaluation.

Details on thematic area wise OFTs conducted under crops by KVKs in Kerala are presented in Table 10. Data indicated that OFTs on different crops were carried out on 10 thematic areas, in which KVKs assessed 145 technological options through 307 trials by involving 297 farmers. More number of OFTs (34) and number of technology options (79) were assessed under the thematic area varietal evaluation.

Table 10: Thematic area wise OFTs conducted under crops by KVKs of Kerala

Thematic area	OFTs (No.)	Technologies (No.)	Trials (No.)	Farmers/ locations (No.)	Area (ha)
Cropping system	2	4	7	7	0.07
Farm Machineries	2	3	15	15	6.50
Integrated Disease Management	4	11	10	7	0.75
Integrated Nutrient Management	8	23	49	34	25.50
Integrated Pest Management	5	11	24	24	5.24
Resource Conservation Technology	2	5	7	11	0.02
Seed / Plant production	1	2	4	4	0.30
Value addition	2	4	7	6	0.11
Varietal Evaluation	34	79	177	182	26.76
Weed Management	2	3	7	7	3.20
Total	62	145	307	297	68.45



Assessment of acidity management in paddy by KVK, Alappuzha



Assessment of yard long bean varieties by KVK, Kannur

b. Livestock wise technology assessment

KVKs in Kerala conducted 9 OFTs under livestock wherein 14 technologies were assessed in four thematic areas through 72 trials by involving 99 farmers (Table 11). Evaluation of breeds and

nutrition management were the major thematic areas with three OFTs each. However, more number of technology options (5) were assessed on nutrition management with the participation of 39 farmers.

Table 11: Thematic area wise OFTs conducted under livestock by KVKs of Kerala

Thematic area	OFTs (No.)	Technologies (No.)	Trials (No.)	Farmers/ locations (No.)
Disease management	1	2	25	25
Evaluation of breeds	3	3	12	12
Nutrition management	3	5	12	39
Production and management	2	4	23	23
Total	9	14	72	99



Assessment of poultry breeds by KVK, Alappuzha



Assessment of poultry breeds by KVK, Ernakulam

c. Enterprise wise technology assessment

KVKs in Kerala conducted five OFTs under enterprises with four thematic areas and six technology options through 42 trials by involving 38 farmers (Table 12).

Table 12: Thematic area wise OFTs conducted under enterprises by KVKs of Kerala

Thematic area	OFTs(No.)	Technologies (No.)	Trials (No.)	Farmers / locations (No.)
Organic farming	1	1	4	4
Health and nutrition	2	3	8	4
Household food security	1	1	25	25
Value Addition	1	1	5	5
Total	5	6	42	38

Lakshadweep

One OFT was carried out in livestock under the thematic area nutrition management with one technology option through 4 trials by involving 4 farmers.

3.1.2 Location specificity of technologies

Karnataka

(a) Assessment of chickpea varieties under rainfed conditions:

Eight KVKs namely Bagalkot, Ballari, Dharwad, Gadag, Kalaburagi-II, Chitradurga, Chikkamagaluru and Mysuru assessed chickpea varieties viz., JG-11, JAKI-9218, BGD 111-1, NBeG-49, Super Annigeri-01, NBeG-47 and NBeG-3 under rainfed conditions in both north and south Karnataka. In the northern parts of Karnataka, NBeG-3 variety performed better with the yield of 36.51 q/ha as compared to all other varieties (BGD-111-1 (30.64 q/ha) and Super Annigeri-01 (29.45 q/ha) in Kalaburagi district followed by NBeG-49 performed better (24.95

q/ha) as compared to NBeG-47 (24.55 q/ha), JAKI-9218 (21.45 q/ha) and JG-11 (20.00 q/ha) in Gadag; NBeG-49 performed better (16.50 q/ha) as compared to BGD-111-1 (16.15 q/ha) and JAKI-9218 (14.25 q/ha) in Dharwad; NBeG-49 performed better (16.25 q/ha) as compared to JG-11 (14.13 q/ha) and Super Annigeri-01 (13.50 q/ha) in Ballari; BGD-111-1 performed better (15.83 q/ha) as compared to NBeG-49 (14.75 q/ha) and JAKI-9218 (14.67 q/ha) in Bagalkot). In southern parts of Karnataka, JG-11 performed better (20.30 q/ha) as compared to JAKI-9218 (19.60 q/ha) in Chitradurga followed by Super Annigeri 01 performed better (15.80 q/ha) as compared to BGD-111-1 (15.10 q/ha) and JG-11 (13.15 q/ha) in Mysuru; and Super Annigeri 01 performed better (13.75 q/ha) as compared to BGD-111-1 (9.80 q/ha) and JG-11 (8.50 q/ha) in Chikkamagaluru. Thus, in north Karnataka, NBeG-3 gave highest yield in Kalaburagi followed by NBeG-49 in Gadag, Dharwad, Ballari and BGD 111-1 in Bagalkot, whereas in south Karnataka, Super Annigeri 01 gave high yield in Mysuru, Chikkamagaluru and JG-11 in Chitradurga.



Assessment of chickpea varieties by KVK, Chitradurga



Assessment of chickpea varieties by KVK, Ballari

(b) Assessment of groundnut varieties under irrigation

Three KVKs namely Belagavi-I, Kalaburagi-II and Koppal assessed groundnut varieties viz., TMV-2, G-2-52, KGD-128, Dh-256, Kadiri Lepakshi (K-1812), K-9, Dharani and KDG-128 under irrigated conditions. Kadiri Lepakshi (K-1812) performed better (32.60 q/ha) as compared to G-2-52 (24.30 q/ha), KGD-128 (22.80 q/ha) and TMV-2 (17.50 q/ha) in Koppal followed by Dh-256 performed better (31.50 q/ha) as compared to Kadiri Lepakshi (28.72 q/ha), K-9 (25.76 q/ha) and Dharani (19.79 q/ha) in Kalaburagi-II; KGD-128 performed better (22.37 q/ha) as compared to G-2-52 (20.93 q/ha) and TMV-2 (14.96 q/ha) in Belagavi-I. Thus, under irrigation, Kadiri Lepakshi gave highest yield in Koppal followed by Dh-256 in Kalaburagi-II and KGD-128 in Belagavi-I.



Assessment of groundnut varieties by KVK, Belagavi I

c. Assessment of groundnut varieties under rainfed

Two KVKs namely Chitradurga and Tumakuru-II assessed groundnut varieties viz., TMV-2, Dh-256, Kadiri Lepakshi (K-1812), DGMRB-24, DGMRB-32 and K-6 under rainfed conditions. Kadiri Lepakshi performed better (20.60 q/ha) as compared to Dh-256 (19.00 q/ha) and TMV-2 (17.74 q/ha) in Chitradurga followed by DGMRB-24 performed better (12.78 q/ha) as compared to Kadiri Lepakshi (12.65 q/ha), DGMRB-32 (9.34 q/ha) and K-6 (9.28 q/ha) in Tumakuru-II. Thus, under irrigation, Kadiri Lepakshi performed better in both Chitradurga and Tumakuru-II.



Assessment of groundnut varieties by KVK Chitradurga

(d) Assessment of safflower varieties

Two KVKs namely Bidar and Kalaburagi-II were assessed Safflower varieties viz., A-2, PNBS-12 and ISF-764. Safflower variety ISF-764 performed better (21.50 q/ha) as compared PNBS-12 (20.30 q/ha) and A-2 (18.50 q/ha) in Kalaburagi-II followed by ISF-764 performed better (15.55 q/ha) as compared to PNBS-12 (14.60 q/ha) and A-2 (12.95). Thus, ISF-764 is the best as it gave high yield in both districts – Kalaburagi and Bidar as compared to all other tested varieties.

(e) Assessment of chilli hybrids

Four KVKs namely Belagavi-II, Kodagu, Tumakuru-I and Tumakuru-II assessed different chilli hybrids viz., Arka Gagan, HY – 80, Arka Sanvi, Arka Tanvi, Arka Meghana, Arka Khyati, Arka Yashasvi and KBCH-1 under different agro-climatic conditions. Highest yield was recorded by Arka Meghana (322.70 q/ha) as compared to Arka Khyati (291.00 q/ha) in Belagavi-II followed by Arka Gagan performed better (235.50 q/ha) as compared Arka Sanvi (225.00 q/ha) and HY-80 (210.00 q/ha) in Tumakuru-I; Arka Gagan performed better (160.00 q/ha) as compared to Arka Yashasvi (158.40 q/ha) and KBCH-1 (151.80 q/ha) in Kodagu; and Arka Tanvi performed better (177.80 q/ha) as compared to HY-80 (166.50 q/ha) and Arka Gagan (161.20 q/ha) in Tumakuru-II. Thus, highest yield was recorded by Arka Meghana in Belagavi-II followed by Arka Gagan performed better in the hill district of Kodagu as well as in parts of Tumakuru. Arka Tanvi performed better than other hybrids in some parts of Tumakuru. All these hybrids were also economically viable with higher BC ratio in respective locations.



Assessment of chilli hybrids by KVK, Belagavi II



Assessment of chilli hybrids by KVK, Tumakuru II

(f) Assessment of fodder napier hybrids

Three KVKs namely Bengaluru Rural, Chamarajanagara and Mysuru assessed fodder napier hybrids. Co-5 was the best in terms of yield (2471 q/ha) as well as fast growth (295 cm at first cut), in Mysuru. In the same district, BNH-10 performed the next best with the yield of 1990 q/

ha. PBN-342 was the fast-growing in Bengaluru Rural district with the height of 257 cm at the first cut (Table 13).

(g) Assessment of different bio-formulations against bacterial blight and wilt diseases of pomegranate

Two KVKs namely Tumakuru-I and Tumakuru-II assessed different technology options on bio-formulations for the management of bacterial blight and wilt diseases of pomegranate with farmers practice and results are presented in Table 14. Data indicates that the IIHR Action-plus was found to be superior with least disease incidence in both the locations. NRC Pomegranate recommendation of drenching with *Aspergillus niger* @ 5 gm / plant + *Pseudomonas* @ 20 gm + drenching with VAM @ 25 gm /plant was also found to be effective.



Assessment of technological options to manage pomegranate diseases by KVK, Tumakuru II

Table 13: Assessment of fodder Napier hybrids by three KVKs of Karnataka

KVK Districts	Fodder Napier varieties			
	CO-3	BNH-10	PBN-342	CO-5
Yield (q/ha)				
Bengaluru Rural	1132	1267	1363	1214
Chamarajanagara	1545	1615	1818	1745
Mysuru	1500	1990	1840	2471
Height (cm)				
Bengaluru Rural	235.6	248.9	257.0	245.0
Chamarajanagara	154.4	138.4	166.1	160.2
Mysuru	190.0	230.0	210.0	295.0

Table 14: Assessment of different bio-formulations against bacterial blight and wilt diseases of pomegranate by two KVKs of Karnataka.

Technology options	KVK Tumkur-I	KVK Tumkur-II
Yield (q/ha)		
TO-1: Farmers practice	78.00	61.00
TO-2: NRCP - Drenching with <i>Aspergillus niger</i> @ 5 gm / plant + <i>pseudomonas</i> @ 20 gm + drenching with VAM @ 25 gm /plant	96.50	74.00
TO-3: IIHR - Actino bacterial consortium: <i>Actinoplus</i> @ 50 gm /plant.	100.00	77.00
TO-4: IFFCO - Liquid Bio fertilizer Consortium	84.50	64.00
Blight Incidence (%)		
TO-1: Farmers Practice	31.00	48.10
TO-2: NRCP - Drenching with <i>Aspergillus niger</i> @ 5 gm / plant + <i>pseudomonas</i> @ 20 gm + drenching with VAM @ 25 gm /plant	9.40	28.30
TO-3: IIHR - Actino bacterial consortium: <i>Actinoplus</i> @ 50 gm /plant.	8.50	22.80
TO-4: IFFCO - Liquid Bio fertilizer Consortium	16.50	39.50
Wilt incidence (%)		
TO-1: Farmers Practice	7.40	14.50
TO-2: NRCP - Drenching with <i>Aspergillus niger</i> @ 5 gm / plant + <i>pseudomonas</i> @ 20 gm + drenching with VAM @ 25 gm /plant	1.70	4.70
TO-3: IIHR - Actino bacterial consortium: <i>Actinoplus</i> @ 50 gm /plant.	1.50	2.40
TO-4: IFFCO - Liquid Bio fertilizer Consortium	2.70	10.20

Kerala

(a) Assessment of cassava varieties:

Two KVKs namely Kollam and Alappuzha different cassava varieties *viz.*, Sree Pavithra, Sree Raksha, Sree Suvarna and Sree Sakthi along with local variety. Highest yield was recorded by Sree Suvarna (385 q/ha) as compared to Sree Raksha (315.00 q/ha), Sree Sakthi (294.00 q/ha) and local variety (202.30 q/ha) in Alappuzha with BCR of



Assessment of cassava mosaic resistant varieties by KVK, Alappuzha

3.10, 2.54, 2.37 and 1.95, respectively. In case of Kollam, Sree Raksha performed better (180.60 q/ha) as compared to Sree Pavithra (165.50 q/ha) and local variety (128.00 q/ha) with BCR of 2.30, 2.10 and 1.80, respectively. All tested varieties were tolerant to CMD. Variety Sree Raksha was the most suitable in terms of consumer preference and cooking quality in both the locations

(b) Assessment of redgram as an intercrop in banana:

Two KVKs namely Kollam and Thiruvananthapuram assessed redgram as an intercrop in banana with varieties from ICRISAT (ICPL-88039) and TNAU (VBN (Rg)-3) in Kerala conditions. In terms of yield, ICPL 88039 performed better (7.150 q/ha) as compared to VBN (Rg)-3 (6.26 q/ha) in Kollam district whereas VBN (Rg)3 was better (4.08 q/ha) as compared to ICPL-88039 (3.79 q/ha) in Thiruvananthapuram district.

3.1.2 Frontline demonstrations (FLDs)

Frontline demonstrations on field crops, horticulture crops, livestock and fisheries, farm implements and other allied enterprises were taken up to demonstrate the production potentials of newly released crop varieties, natural resource conservation technologies, crop production and protection technologies, improved technologies in livestock and fisheries and other activities in problem solving mode. A total of 5191 frontline demonstrations were conducted including 1420 on cereals and millets, 466 on oilseeds, 602 on pulses, 100 on commercial crops, 73 on fibre crops, 119 on fodder crops, 450 on vegetable crops, 70 on tuber

crops, 223 on fruit crops, 56 on flower crops, 137 on plantation crops, 251 on spices, 15 on green manure crops, 338 on hybrids of various crops, besides 205 demonstrations on agricultural farm implements, 213 demonstrations on livestock, 163 on fisheries and 290 demonstrations on enterprises in the states of Karnataka, Kerala and Lakshadweep Islands (Table 15).

3.1.2.1 Cereals and millets

A total of 1420 demonstrations were conducted on major cereals and millet crops such as paddy, wheat, maize, sorghum, pearl millet, finger millet, little millet, foxtail millet and brown top covering

Table 15: State-wise frontline demonstrations including CFLD pulses and oilseeds conducted by KVKs in Zone-XI

Crop category	Karnataka		Kerala		Lakshadweep		Total	
	Demo (No.)	Area (ha)	Demo (No)	Area (ha)	Demo (No.)	Area (ha)	Demo (No.)	Area (ha)
Cereals and millets	1106	403.50	314	139.20			1420	542.70
Oilseeds	456	155.80	10	1.00			466	156.80
Pulses	602	215.00	-	-			602	215.00
Commercial crops	100	32.50	-	-			100	32.50
Fibre crops	73	29.40	-	-			73	29.40
Fodder crops	100	18.90	15	0.31	4	2.00	119	21.21
Vegetables	343	118.08	107	8.56			450	126.64
Tubers	24	4.20	46	2.98			70	7.18
Fruits	202	78.40	21	0.80			223	79.20
Flowers	49	8.40	7	0.16			56	8.56
Plantation crops	125	45.00	12	1.60			137	46.60
Spices	171	55.50	80	7.18			251	62.68
Green manure crops	15	6.00	-	-			15	6.00
Hybrids	328	112.50	10	0.40			338	112.90
Farm implements	105	41.00	100	31.00			205	72.00
Livestock (units)	47	-	162	-	4		213	-
Fisheries (units)	96	-	67	-			163	-
Enterprises (units)	226	-	64	-			290	-
Total	4168	1324.18	1082	221.19	8	2.00	5191	1519.37

an area of 542.70 ha during the year by the KVKs of ATARI Bengaluru in the state of Karnataka and Kerala. The technology-wise results were presented below:

Karnataka

During the year 2022, a total demonstrations of 502 in paddy, 20 in wheat, 178 in maize, 100 in sorghum, 20 in pearl millet, 236 in finger millet, 10 in little millet, 40 in foxtail millet, and 10 in brown top millet were demonstrated in farmers’ fields, covering an area of 403.50 ha in the state of Karnataka (Table 16).

In paddy, improved technologies such as ICM, resource conservation-DSR method, organic cultivation, paddy mat nursery production, INM, Site specific nutrient management (SSNM), nutrient management-Nano fertilizers, green manuring, weed management, improved varieties viz., Sahyadri Panchamukhi, KMP-220, MSN-99, RNR-15048, Sahyadri Brahma, Sahyadri Kempumukthi, Sayyandri Kempu Mukti, IPM, eco-friendly pest management, IPDM and seed production technologies gave an overall increase in

grain yield of 16.60 per cent over their respective checks. Site specific nutrient management recoded highest yield of 75.46 q/ha and lowest was 13.20 q/ha in seed production technology. The wheat crop performed better under improved varietal introduction (UAS-304) by recording an increased yield of 33.57q/ha compared to 26.25 q/ha under check. In Rabi sorghum, ICM, IPM, NRM and improved variety (SPV-2217) technologies gave an average of 16.28 q/ha over their checks (13.46 q/ha). Maize intercropping with pigeonpea gave higher yield of 65.01q/ha compared to other technologies. Pearl millet under ICM gave higher yield of 20.79 q/ha as compared to 16.94 q/ha in check. Finger millet under INM technology demonstration recorded higher yield of 36.10q/ha followed by improved finger millet variety KMR-301 (32.75 q/ha). ICM demonstration in little millet and brown top recorded higher yield (15.50 q/ha and 8.16 q/ha, respectively) as compared to their checks. Improved foxtail millet variety (HN-46) recorded higher yield 20.00 q/ha compared to 15.00q/ha in check (Table 16).

Table 16: Frontline demonstrations conducted on cereals and millets by the KVKs of Karnataka

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check (₹./ha)	
								Net return	BCR	Net return	BCR
Paddy	ICM	8	110	44.00	59.83	51.01	17.29	77666	2.53	57014	2.11
	Resource conservation- DSR method	3	33	13.20	61.28	57.86	5.91	70463	2.39	49143	1.74
	Organic cultivation	2	15	6.00	49.56	55.56	-10.80	110211	3.20	102772	2.40
	Paddy mat method nursery production	1	80	3.00	43.12	34.50	24.99	45000	2.09	42500	2.60
	INM	2	30	6.00	28.20	22.70	24.23	30174	1.52	20527	1.41
	Site specific nutrient management	1	10	4.00	75.46	71.40	5.69	80400	2.21	73200	2.05
	Nutrient management -Nano fertilizers	1	10	4.00	74.81	69.50	7.64	91130	2.33	80450	2.11

Paddy	Green manuring	1	10	4.00	27.74	22.66	22.42	28978	2.09	20522	1.83
	Weed Management	2	29	11.60	53.30	49.07	8.04	57735	1.96	49303	1.80
	Salt tolerant variety GNV-1109	1	10	4.00	74.37	56.50	31.63	74300	2.12	54400	1.78
	Flood tolerant variety Sahyadri Panchamukhi	1	16	6.40	31.50	28.00	12.50	22680	1.43	14280	1.27
	Varietal introduction KMP 220	1	10	4.00	60.00	50.00	20.00	122400	3.65	71273	2.54
	Varietal introduction MSN-99	1	15	6.00	64.80	52.20	24.14	60700	1.92	25160	1.37
	Varietal introduction RNR-15048	2	25	10.00	62.26	51.09	21.83	71528	2.30	41745	1.75
	Varietal introduction Sahyadri Brahma	1	19	7.50	34.00	32.50	4.62	30240	1.54	21840	1.39
	Varietal introduction Sahyadri Kempumukthi	1	10	4.00	61.38	48.23	27.27	48355	1.97	32315	1.72
	Varietal introduction Sayyandri Kempu Mukti	1	10	2.00	41.25	30.75	34.15	70300	2.48	46690	1.98
	IPM	1	5	2.00	70.50	58.25	21.03	58975	1.61	38920	1.44
	Eco friendly pest management	3	30	12.00	53.97	50.61	7.96	65990	2.60	56212	2.26
	IPDM	2	20	8.00	46.90	38.37	25.18	67740	3.29	49628	2.64
	Seed production	1	5	2.00	13.20	11.70	12.82	40200	2.01	30200	1.85
	Total/ Average		502	163.70	51.782	44.87	16.60	63103	2.25	46576	1.91
Wheat	ICM	1	5	2.00	28.06	24.48	14.62	44107	2.28	37423	2.04
	INM	1	10	4.00	29.43	26.49	11.10	37000	2.69	32420	2.58
	Varietal introduction UAS-304	1	5	2.00	33.57	26.25	27.89	71250	3.38	50750	2.81
	Total/ Average		20	8.00	30.35	25.74	17.92	50786	2.77	40198	2.43

Sorghum	ICM	1	15	6.00	16.62	12.88	29.04	39430	3.31	26937	2.60
	IPM	1	10	4.00	11.35	9.61	18.11	25794	2.71	19686	2.32
	Soil moisture conservation	1	20	8.00	12.89	10.28	25.39	26443	2.24	17767	1.88
	ICM	3	30	12.00	19.57	16.71	17.26	30719	2.28	23067	2.05
	Varietal introduction-SPV-2217	1	25	10.00	20.95	17.80	17.70	26470	1.49	18274	1.39
	Total/ Average		100	40.00	16.28	13.46	20.95	22479	1.76	16473	1.63
Maize	Nutrient management	1	10	4.00	49.13	43.63	12.61	46932	2.38	39080	2.25
	INM-Nano fertilizers	4	52	21.00	41.16	36.99	12.19	50264	2.63	41187	2.32
	IPDM	1	10	4.00	56.50	50.75	11.33	76100	2.58	63650	2.33
	IPM-FAW	5	65	26.00	56.37	47.82	17.21	17476	1.20	13662	1.18
	Intercropping	1	25	10.00	21.68	19.13	13.33	42567	1.92	31337	1.67
	Intercropping with pigeonpea	1	6	2.40	65.01	54.83	18.57	77887	1.60	62166	1.57
	Total/ Average		178	71.40	48.83	42.70	14.36	30575	1.45	20345	1.31
Pearl millet	ICM	2	20	8.00	20.79	16.94	22.73	25107	2.99	17371	2.15
Finger millet	ICM	5	91	36.40	25.95	22.47	14.99	43189	2.19	33346	2.00
	INM	3	40	15.00	36.10	28.47	25.72	55055	2.51	39616	2.14
	Short duration variety KMR-630	4	40	16.00	25.83	21.25	22.05	45523	2.39	32615	2.01
	Blast resistant variety KMR-316	3	45	18.00	25.34	22.67	13.07	46502	2.65	35619	2.34
	Introduction of new variety KMR-301	1	20	8.00	32.75	25.20	29.96	39860	2.12	18980	1.46
	Total/ Average		236	93.40	29.19	24.01	21.57	46411	2.37	33867	2.04
Little millet	ICM	1	10	4.00	15.50	13.35	16.10	29000	2.66	22430	2.50
Foxtail millets	Variety demonstration DHFt-109-03	2	25	10.00	12.30	9.91	24.03	23905	2.52	16690	2.09
	Varietal introduction HN-46	1	10	4.00	20.00	15.00	33.33	42500	3.43	26875	2.48
	Variety for value addition GPUF-3	1	5	1.00	10.70	9.40	13.83	21300	1.99	16100	1.75
	Total/ Average		40	15.00	14.33	11.44	25.26	27903	2.58	19089	2.08
Brown top	ICM	1	10	4.00	8.16	6.70	21.79	13400	1.88	9200	1.65
	Grand total		1106	403.50							



ICM in Paddy (KVK, Kodagu)



Maize+ pigeonpea intercropping system
(KVK, Gadag)



Short duration variety of finger millet KMR-630
(KVK, Tumakuru-II)



Foxtail millet (KVK, Bengaluru rural)

Kerala

A total of 314 demonstrations on paddy covering an area of 139.20 ha were conducted during the year (Table 17). The technologies such as salinity management, wild boar management, ICM, weedy rice in Upper Kuttanad area, varietal demonstration viz., Manuratna, Pournami, Akshaya, Supriya, ICT in agriculture, INM-UAV use, INM-Nano urea, Silica as amendment for managing iron toxicity, IDM, ecofriendly management of rice bug, IPDM, mechanization in crop production and participatory seed production demonstrations gave an average 52.46 q/ha yield as compared to check (45.88q/ha). The highest paddy yield was recorded under participatory seed production with 75.00 q/ha followed by INM with nano urea technology (68.50 q/ha).



Weed Management in Paddy (KVK, Kannur)



Upland paddy (KVK, Alapuzza)

Table 17: Frontline demonstrations on cereals conducted by KVKs of Kerala

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	Increase (%)	Demo		check	
								Net return	BCR	Net return	BCR
Paddy	Salinity management	2	10	4.00	60.25	58.90	2.29	88000	2.10	102590	2.28
	Wild boar management	1	41	44.00	63.00	48.00	31.25	104750	2.45	63438	1.91
	ICM	1	5	4.00	52.00	42.00	23.81	68165	1.85	40185	1.50
	Weedy rice in Upper Kuttanad area	3	34	10.00	48.95	39.58	23.66	50603	1.63	20713	1.24
	Short duration variety Manuratna	4	34	16.00	40.58	40.73	-0.39	38445	1.49	24333	1.28
	High yielding variety Pournami	2	15	4.00	45.26	38.38	17.93	37027	1.41	22078	1.26
	High yielding long duration Rice variety Akshaya	1	5	2.00	60.00	52.50	14.29	93000	2.24	72000	1.96
	Varietal demonstration Supriya	1	11	4.00	60.60	67.30	-9.96	97710	2.30	109305	2.32
	ICT in agriculture	1	15	8.00	50.25	42.85	17.27	69222	1.75	47241	1.49
	INM-UAV use	3	39	16.00	57.53	52.70	9.17	96765	2.29	73218	2.46
	INM-Nano urea	1	5	1.00	68.50	50.00	37.00	113100	2.30	63583	1.67
	Silica as amendment for managing iron toxicity	1	5	2.00	33.75	29.00	16.38	21375	1.24	5700	1.06
	IDM	2	30	8.20	44.52	39.25	13.41	36510	1.46	12375	1.15
	Ecofriendly management of rice bug	1	5	5.00	65.00	62.50	4.00	2271	1.03	3037	1.03
	IPDM	2	20	8.00	49.05	45.90	6.86	59046	1.75	51143	1.66
	Mecha- nization in crop production	1	20	2.00	17.65	7.90	123.42	20902	2.02	6691	1.42
	Participatory seed production	1	20	1.00	75.00	62.50	20.00	25067	1.30	3037	1.03
Grand Total			314	139.20	52.46	45.88	14.34	60115	1.77	42392	1.54

3.1.2.2 Oilseeds

During the year 466 demonstrations were conducted by KVKs Zone- XI covering groundnut, niger, sunflower, sesamum, safflower, mustard, castor and soybean under 156.8 ha area in farmers' fields. The crop-wise results are presented in the forgoing discussion.

Karnataka

During the year, a total demonstrations of 230 in groundnut, 25 in sunflower, 10 in niger, 10 in castor, 26 in mustard, 5 in safflower, 38 in sesamum and 112 in soybean were demonstrated by KVKs of Karnataka under oilseeds in an area of 155.8 ha (Table 18). The groundnut crop performed better under ICM, groundnut + pigeonpea (8:2) intercropping, micro nutrient management, soil fertility management, IDM, IPDM and improved

varietal introduction (Dh-256) by recording an increased average yield of 19.95 q/ha as compared to farmers practice (16.85 q/ha). The highest yield of 27.40 q/ha was recorded by variety Dh-256, which was higher than check by 20.92 per cent. Sunflower, castor, mustard and sesamum under ICM technology recorded higher yield of 13.99 q/ha, 11.98 q/ha, 6.54 q/ha and 6.98 q/ha, respectively as compared to their check. Demonstration of niger improved variety KBN-1 recorded higher yield (4.75 q/ha) as compared to check (4.08 q/ha). In soybean, technologies like ICM, INM, IPDM, IPM, IDM and improved varieties such as Dsb-34, and Dsb 21 resulted in higher average yield of 15.90 q/ha over farmers practice (14.48 q/ha). Among the technologies demonstrated in soybean, IPM demonstrated recorded the higher yield of 22.14 q/ha as compared to check (16.37q/ha).

Table 18: Frontline demonstration on oilseeds conducted by KVKs of Karnataka

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Groundnut	ICM	6	158	43.00	20.15	16.55	21.81	74881	2.53	57841	2.24
	Groundnut + pigeonpea (8:2)	2	15	6.00	17.26	14.83	12.92	74809	2.68	59648	2.54
	Micro nutrient management	1	10	4.00	22.65	19.73	14.80	91575	3.07	78555	2.97
	Soil fertility management	1	10	4.00	20.10	18.71	7.43	79435	3.08	69314	2.73
	IDM	1	5	1.00	13.88	9.70	43.09	48453	2.16	26400	1.72
	IPDM	2	22	8.80	18.21	15.77	15.24	83778	2.90	62470	2.30
	Varietal introduction Dh-256	1	10	4.00	27.40	22.66	20.92	102525	3.57	79401	3.07
	Total/ Average		230	70.80	19.95	16.85	18.40	77746	2.71	60354	2.39
Sunflower	ICM	2	25	10.00	13.99	12.51	11.83	50264	1.84	39183	1.66
Niger	Varietal Introduction- KBN-1	1	10	4.00	4.75	4.08	16.42	34700	3.71	21480	2.86
Castor	ICM	1	10	4.00	11.98	7.04	70.17	20214	1.60	2554	1.10

Mustard	ICM	1	26	10.00	6.54	5.30	23.40	21794	2.25	15036	1.89
Safflower	Variatal Evaluation	1	5	2.00	13.75	11.50	19.57	43750	2.43	33400	2.16
Sesamum	ICM	1	38	10.00	6.98	5.30	31.70	40954	2.42	22334	1.83
Soybean	ICM	2	60	24.00	17.00	14.64	16.10	53121	2.28	39251	1.96
	INM	1	5	2.00	7.70	6.40	20.31	76075	3.03	53100	2.29
	IPDM	1	5	2.00	17.15	13.70	25.18	75150	3.89	52500	2.85
	IDM	1	12	5.00	18.00	18.00	0.00	86650	4.24	58948	3.26
	IPM	1	5	2.00	22.14	16.37	35.25	74042	2.36	35182	1.61
	Varietal introduction DSb-34	2	15	6.00	21.55	17.80	20.46	90372	4.05	69234	3.29
	Varietal demonstration DSb-21	1	10	4.00	7.80			17040	1.36	0	
	Total/Average			112	45.00	15.90	14.48	9.81	68438	2.84	52087
Grand total			456	155.80							



FLD on groundnut (KVK, Dharwad)



ICM in soybean (KVK, Davanagere)



ICM in sunflower (KVK, Bagalkot)



FLD on Sesamum (KVK, Ernakulam)

Kerala

A total of 10 demonstrations were conducted by one KVK of Kerala on sesamum production technology covering an area of 1.00 ha (Table 19).

Demonstration of crop production technology in sesamum recorded an average yield of 6.98 q/ha with the net return ₹.56585/ha and B: C ratio of 2.03.

Table 19: Frontline demonstrations on oilseeds conducted by KVKs of Kerala

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Sesamum	Crop production	1	10	1.00	6.98	-	-	56585	2.03	-	-

3.1.2.3 Pulses

A total of 602 demonstrations were undertaken on major pulses in 215.00 ha area of farmers' fields by KVKs of Karnataka under ATARI Bengaluru. The technology wise results are presented as below:

Karnataka

A total demonstrations of 117 in bengal gram, 97 in black gram, 69 in field bean, 129 in green gram, 23 in horse gram, 157 in pigeonpea and 10 in cluster bean were demonstrated by KVKs of Karnataka during the year (Table 20). During Rabi season, ICM, ecofriendly pest management, rust disease management IDM, micro nutrients management, nipping, improved varietal introduction- JG-11 & BGD-103 technologies were demonstrated in bengal gram. The higher bengal gram yield of 23.55 q/ha was recorded in ICM technology demonstration followed by 21.44 q/ha in micro nutrients management technology. In black

gram, overall yield increase due to ICM, varietal introduction such as BDU-12, LBG-791 and TRCRU-22 and IPM was 32.01% over check. Field bean under ICM recorded a yield of 59.16 q/ha, which was 32.04 % higher as compared to check (42.54 q/ha). In green gram, improved variety DGGV-2 recorded highest yield of 10.30 q/ha as compared to 8.35 q/ha in check. Demonstration of improve variety CRHG-19 of horse gram recorded higher yield of 7.20q/ha as compared to check (5.94 q/ha). The technologies like ICM, IPDM, IPM and improved varieties (BRG-3, GRG-811, BRG-5 & GRG-152) were demonstrated in pigeonpea. Among these technologies, improved variety BRG-5 recorded higher yield of 15.60 q/ha, which was followed by improved variety-GRG-152 (15.29 q/ha). Demonstration on nutrient management in cluster bean recorded higher yield of 60.88 q/ha with the B:C of 1.77.

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

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
	ICM	2	37	15.00	23.55	19.65	19.95	21910	1.35	17738	1.32
	Ecofriendly pest management	1	10	4.00	17.50	15.70	11.46	51450	2.92	43850	2.64

Bengal gram	Rust disease management	1	10	4.00	13.70	11.35	20.70	38110	2.56	25530	1.96
	IDM	2	20	8.00	13.81	11.88	17.43	29338	1.99	19815	1.65
	Micro nutrients management	1	10	4.00	21.44	18.21	17.74	79770	3.09	63505	2.73
	Nipping in chickpea	1	10	4.00	11.20	9.97	12.34	30660	2.30	25117	2.13
	Varietal introduction JG-11	1	10	4.00	17.50	15.00	16.67	12500	1.17	5000	1.07
	Variety demonstration BGD-103	1	10	4.00	15.15	13.10	15.65	32439	2.10	21950	1.69
	Total/ Average		117	47.00	16.73	14.36	16.50	34742	1.87	26006	1.67
Blackgram	ICM	1	60	15.00	5.50	3.27	68.20	16690	2.23	8427	1.88
	Varietal Evaluation BDU-12	1	10	4.00	10.20	9.10	12.09	45800	2.00	37150	1.83
	High yielding variety LBG-791	1	10	4.00	15.85	12.00	32.08	80054	3.72	50710	2.58
	Varietal introduction TRCRU-22	1	5	2.00	7.50	5.50	36.36	47500	3.38	31500	2.75
	IPM	1	12	5.00	14.81	10.93	35.50	65984	5.26	44891	3.94
	Total/ Average		97	30.00	10.77	8.16	32.01	51206	3.06	34536	2.44
Field bean	ICM	3	32	13.00	59.16	42.54	32.04	87902	2.93	54812	2.11
	Intercropping in arecanut	2	12	4.00	20.75			34386	2.86	0	
	Introduction of new variety Arka Sambhram	2	25	8.00	33.50	23.88	40.59	144485	3.54	79075	2.24
	Total/ Average		69	25.00	37.80	33.21	36.31	88924	3.11	44629	2.18
Greengram	ICM	2	87	20.00	6.36	4.46	44.09	18073	2.55	9983	2.07
	High yielding variety DGGV-2	1	25	10.00	10.30	8.35	23.35	44225	1.65	30996	1.57
	Varietal introduction TRCRM-147	1	5	2.00	7.86	5.32	47.74	43810	2.90	21220	1.88
	IDM	1	12	5.00	9.00	8.00	12.50	30035	3.03	26391	2.99
	Total/ Average		129	37.00	8.38	6.53	28.33	47819	1.38	35560	1.26
Horsegram	Improved varieties CRHG-19	2	23	9.00	7.20	5.94	21.21	14490	1.95	10974	1.78
	ICM	2	55	22.00	11.94	8.74	42.48	42522	2.29	25096	1.82
	IPDM	1	10	4.00	13.82	10.35	33.53	5918	1.08	39331	2.65
	IPM	1	30	12.00	11.98	10.07	18.97	28180	1.83	16780	1.52
	Variety demonstration BRG-3	1	10	4.00	5.41	4.12	31.31	82465	3.26	43858	2.14

Pigeon pea	Resource conservation GRG-811	1	12	5.00	12.25	8.50	44.12	40950	2.17	19700	1.60
	Varietal introduction BRG-5	1	10	4.00	15.60	13.35	16.85	58775	2.69	41200	2.35
	Variety demonstration GRG-152	3	30	12.00	15.29	13.48	13.42	71617	3.32	59058	2.90
	Total/Average		157	63.00	12.33	9.80	25.82	51618	2.37	38823	2.24
Cluster bean	Nutrient Management	1	10	4.00	60.88	56.35	8.03	53000	1.77	50200	1.80
	Grand total		602	215.00							



Pigeonpea variety GRG-152 (KVK, Vijayapura-I)



Field bean (KVK, Hassan)



Nipping demonstration in Bengalgram (KVK, Chitradurga)



Greengram (KVK,Gadag)

3.1.2.4 Commercial crops

A total of 100 demonstrations were conducted on major commercial crops such as mulberry, sugarcane, betel vine and bamboo covering an area of 32.50 ha during the year by the KVKs of Karnataka under ATRAI Bengaluru. The technology-wise results were presented below:

Karnataka

A total demonstrations of 60 in sugarcane, 15 in mulberry, 20 in betel vine and 5 in bamboo

covering an area of 32.50 ha were demonstrated during the year by the KVKs of Karnataka (Table 21). In sugarcane, technologies like ICM, resource conservation technology, IDM, INM, management of white grub and varietal introduction of CO-9004 (Amrut) were demonstrated in the farmers' field which have recorded an average yield of 1151.31 q/ha and BCR of 3.71 as compared to 964.00 q/ha sugarcane yield and BCR of 3.12 under the check. In mulberry, INM and nutrient management technologies were demonstrated.

Among the two technologies, nutrient management recorded increased mulberry leaf yield by 12.50 % over check. Demonstration of betel vine under IPDM recorded a yield of 910000 leaves/ha, which was 13.04 per cent higher as compared to

check (805000 leaves/ha). Bamboo demonstrated as a agroforestry component recorded higher yield of 20.50 no. of culms as compared to check (10.50 no. of culms).

Table 21: Frontline demonstrations on commercial crops conducted by KVKs of Karnataka

Crop	Production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Sugar-cane	ICM	1	10	4.00	1816.00	1401.00	29.62	393260	12.74	287840	7.84
	Resource conservation technology	1	5	2.00	1037.00	896.00	15.74	193063	3.09	161153	2.89
	IDM	1	10	4.00	1083.00	944.00	14.72	208410	3.48	161580	2.73
	INM	1	5	2.00	1138.00	947.00	20.17	226720	3.47	180240	3.12
	Management of white grub	3	25	10.00	771.87	677.17	20.07	179491	2.46	129886	2.07
	Varietal introduction CO-9004 (Amrut)	1	5	2.00	1062.00	918.80	15.59	199800	3.17	167450	2.96
	Total/Average			60	24.00	1151.31	964.00	19.43	233457	3.71	181358
Mul-berry	INM	1	5	1.00	493.80	441.50	11.85	707350	3.99	668500	3.64
	Nutrient management	1	10	4.00	540.00	480.00	12.50	856900	4.43	603280	3.74
	Total/Average		15	5.00	516.90	460.75	12.19	782125	4.21	635890	3.69
Betel vine (leaves/ha)	IPDM	1	20	2.50	910000	805000	13.04	182560	2.08	15090	1.05
Bamboo	Agroforestry	1	5	1.00	20.50	10.50	95.24	262000	3.90	140000	2.75
Grand Total			100	32.50							



INM in mulberry for higher productivity (KVK, Kolar)



Management of white grub in Sugarcane (KVK, Vijayapura –I)

3.1.2.5 Fiber crops

During the year, 73 demonstrations on cotton were conducted by the KVKs in Karnataka covering 29.40 ha area. Technology wise results are discussed as below:

Karnataka

In cotton, technologies like intercropping with soybean, INM and IPM were demonstrated in the farmers' field, which have recorded an average yield of 16.73 q/ha and BCR of 3.12 as compared to the check (14.25 q/ha and 2.32, respectively). Among these technologies higher yield was recorded in INM (20.65 q/ha) followed by IPM (20.13 q/ha) (Table 22).



IPM IN cotton (KVK, Ballari)

3.1.2.6 Fodder crops

During the year, 115 demonstrations were conducted on fodder crops in 19.21 ha by the KVKs of ATARI Bengaluru. State wise and technology wise results are presented below:

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

Crop	Production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
								Demo		Check	
					Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Cotton	Inter cropping with soybean	1	10	4.00	9.40	8.00	17.50	81137	2.32	26141	1.62
	INM	4	36	14.40	20.65	18.34	12.26	112306	3.27	91281	2.83
	IPM	3	27	11.00	20.13	16.42	23.43	149595	3.18	105837	2.01
	Total / Average		73	29.40	16.73	14.25	17.40	121273	3.12	88895	2.32

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

Crop	Production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
								Demo		Check	
					Demo	Check	Increase (%)	Net return	BCR	Net return	BCR
Fodder crops	Varietal introduction COFS-31	5	60	6.90	227.10	174.96	49.55	65150	2.23	50185	2.41
	Mixed fodder production	5	40	12.00	751.90	566.32	79.17	184920	3.44	64520	2.28
	Total/ Average		100	18.90	489.50	370.64	32.07	125035	2.95	57353	2.34

Karnataka

A total of 100 demonstrations were conducted on fodder crops covering an area of 18.90 ha by the KVKs of Karnataka (Table 23). The technologies like varietal introduction CoFS-31 and mixed fodder production were demonstrated in farmer's field. The mixed fodder production recorded higher green fodder yield of 1751.90 q/ha with net profit of ₹.184920/ha.



Varietal introduction CoFS-31 (KVK, Davanagere)



Fodder production (KVK, Kannur)

Kerala

A total of 15 demonstrations were conducted by KVK of Kerala on fodder production technology covering an area of 0.31 ha (Table 24). Demonstration of moringa fodder production recorded green fodder yield of 1111.00 q/ha/year with the net return of ₹.333200/ha

Lakshadweep

A total of four demonstrations were conducted by KVK of Lakshadweep on fodder production technology covering an area of 2.00ha (Table 25). Demonstration of fodder variety guinea grass in coconut gardens has recorded yield of 1090.00q/ha with net return of ₹.5687/ha.

3.1.2.7 Green manure crops

A total of 15 demonstrations on green manuring crop covering an area of 6.00 ha were implemented by KVKs of Karnataka during the year. Technology wise results are discussed in foregoing discussion.



Green manure crop (KVK, Uttar Kannada)

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

Crop	Production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	Increase (%)	Demo (₹/ha)		Check	
								Net return	BCR	Net return	BCR
Fodder	Crop production	1	5	0.30	930.00	-	-	123456	1.23	-	-
Moringa	Moringa fodder production	1	10	0.01	1111.00	998.20	11.30	333200	1.33	82273	1.10
	Total/Average		15	0.31	1020.50	998.20	2.23	333200	1.33	82273	1.10

Table 25: Frontline demonstrations on fodder crops conducted by KVK Lakshadweep

Crop	Production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Guinea grass	Demonstration of fodder variety Guinea grass in coconut gardens	1	2	1.00	1090.00	-	-	5687	1.13	-	-
Fodder Sorghum	Demonstration of perennial fodder sorghum	1	2	1.00	Issues related to germination						
Total/ Average			2	2.00	1090.00			5687	1.13		

Karnataka

Integrated crop management technology demonstrations was conducted in green manuring crop covering an area 6.00 ha by KVKs of Karnataka (Table 26). Demonstration of ICM technology in green manuring crop has recorded higher yield of 64.80 q/ha as compared to check (49.20 q/ha).

Table 26: Frontline demonstrations on green manure crops conducted by KVKs of Karnataka

Crop	Production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Green manure crop	ICM	1	15	6.00	64.80	49.20	31.71	76450	2.62	43760	1.91

3.1.2.8 Vegetable crops

Vegetable crops such as amaranthus, brinjal, bitter gourd, baby corn, cabbage, cauliflower, carrot, chilli, capsicum, cucumber, drumstick, french bean, garden pea, onion, okra, pole bean, red onion, tomato, ridge gourd, spine gourd, sweet corn, mixed vegetable, yard long bean and nutri-garden were demonstrated with improved technologies under 475 farmers' fields covering an area of 126.64 ha by the KVKs of Karnataka and Kerala. The state wise and technology wise results are presented below:

Karnataka

A total of 343 demonstrations were conducted in major vegetables covering an area of 118.08 ha by the KVKs of Karnataka (Table 27). Demonstration

of Arka actino plus in brinjal gave a yield of 380.00 q/ha with BCR of 4.18. Similarly, IPDM technology demonstration recorded an increased yield in cabbage (25.59%) over farmers' practice. INM-Nano fertilizers technology in baby corn recorded higher corn yield of 29.24 q/ha as compared to 27.59 q/ha in farmers' practice. Onion under IPDM technology demonstration recorded higher yield of 348.00 q/ha as compared to farmers practices. Red onion, capsicum, chilli, tomato, spinegourd, ridge gourd, french bean, cucumber and drumstick under ICM recorded an increased yield of 26.82 per cent, 19.26 per cent, 37.78 per cent, 2.06 per cent, 26.99 per cent, 18.79 per cent, 21.73 per cent, 22.16 per cent and 40.00 per cent, respectively over farmers' practice. In cauliflower, pest management demonstration

has led to increased yield to the tune of 16.67 per cent over their local check. Yard long bean variety Arka Mangala demonstration recorded higher yield of 108.00 q/ha as compared to check. Demonstration of sweet corn under IPM resulted in higher yield of 155.00q/ha over farmers practice (138.00 q/ha). In pole bean, the results revealed that

yield increased by 15.51 % due to IDM technology over check. Demonstration of mixed vegetables resulted in higher yield of 221.78q/ha over farmers practice (186.66 q/ha). Nutri- garden demonstrated with improved technologies under 61 farmers' fields covering an area of 0.70 ha helped to meet the household requirement of vegetables on daily basis.

Table 27: Frontline demonstrations on vegetables crops conducted by KVKs of Karnataka

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Brinjal	Bio intensive management of shoot and fruit borer	1	10	4.00	285.50	218.30	30.78	2283200	11.93	1621401	13.97
	Demonstration of Arka actinoplus	1	5	2.00	380.00	301.20	26.16	433550	4.18	323520	3.52
	ICM	1	10	2.00	200.10	160.10	24.98	291290	3.07	180500	2.09
	Plant Protection	1	5	2.00	321.60	254.00	26.61	235660	5.35	164360	3.56
	Total/ Average		30	10.00	296.80	233.40	27.16	810925	7.00	572445	5.74
Cabbage	ICM	1	10	4.00	365.20	348.00	4.94	326240	3.91	277280	2.98
	IPDM	1	10	2.00	530.00	422.00	25.59	26650	1.20	-24550	0.84
	ICM	1	10	4.00	365.20	348.00	4.94	326240	3.91	277280	2.98
Baby corn	INM-Nano fertilizers	1	5	1.00	29.24	27.59	5.98	89250	2.87	84455	2.61
Onion	ICM	3	26	10.00	268.17	208.82	29.03	125750	1.72	77042	1.49
	INM	1	6	2.40	185.00	154.00	20.13	296175	6.35	232050	5.39
	IPDM	1	10	4.00	348.00	306.00	13.73	390600	4.43	115000	1.54
	IPM	1	5	2.00	227.00	178.50	27.17	351868	3.81	242350	2.83
	Variety demonstration Bhima Shakti	1	5	2.00	286.10	206.70	38.41	251566	4.05	130166	2.70
	Variety demonstration Bhima Shweta	1	5	2.00	175.00	163.00	7.36	142380	3.10	122740	2.68
	Variety demonstration Bhima Super	1	5	1.00	231.80	142.60	62.55	93135	1.77	225582	2.85
	Variety demonstration Agri found Light Red	1	12	4.28	201.30	168.10	19.75	102386	2.04	71246	1.74

Red Onion	ICM	1	25	10.00	37.78	29.79	26.82	22154	1.49	8205	1.28
	Total/ Average		99	37.68	217.79	173.06	25.85	179713	2.60	129785	2.12
Capsicum	ICM	1	5	1.00	142.40	119.40	19.26	329870	4.39	265870	3.88
Cauli flower	Pest management	1	10	4.00	182.00	156.00	16.67	242000	2.98	177000	2.31
Chilli	ICM	1	10	4.00	310.00	225.00	37.78	154613	2.38	94438	1.72
	Nutrient Management	1	10	4.00	204.43	188.55	8.42	63175	1.45	51050	1.37
	Total/ Average		20	8.00	257.21	206.78	24.39	108894	1.86	72744	1.54
Tomato	ICM	1	10	4.00	818.40	801.92	2.06	231435	1.48	220509	1.45
	IDM	1	12	5.00	305.00	240.00	27.08	245500	3.73	184400	2.00
	Total/ Average		22	9.00	561.70	520.96	7.82	238468	1.83	202455	1.60
Yard Long Bean	Variety for high yield Arka Mangala	1	10	4.00	108.00	95.00	13.68	440001	3.59	347500	2.99
Spinegourd	ICM	1	10	0.20	120.20	94.65	26.99	620400	3.75	401300	2.80
Sweet corn	IPM	1	15	6.00	155.00	138.00	12.32	244250	4.71	201400	3.65
Ridge gourd	ICM	2	10	3.20	202.90	171.85	18.79	190768	2.66	140265	2.30
	IPM	1	5	1.00	93.80	71.60	31.01	172124	3.76	122264	3.15
	High Yielding variety-Arka Prasan	1	10	4.00	90.45	70.10	33.10	59500	1.72	36000	1.51
	Total/ Average		25	8.20	129.05	104.52	27.63	140797	2.71	99510	2.32
French Bean	ICM	1	10	1.00	103.03	84.64	21.73	195374	2.72	191133	2.82
Cucumber	ICM	2	15	4.00	186.10	151.60	22.16	220425	2.41	144375	1.79
	IDM	1	12	5.00	114.00	103.00	10.68	38542	3.21	27905	2.79
	Total/ Average		27	9.00	150.05	127.30	17.87	129484	2.49	86140	1.87
Drum stick	ICM	1	5	2.00	7.00	5.00	40.00	125000	2.79	60000	2.50
Pole bean	IDM	2	15	5.00	337.55	292.50	15.51	518980	4.53	397831	3.65
Mixed vegetables	Mixed vegetables production	2	15	6.00	221.78	186.66	58.51	202503	3.09	150692	2.90
Nutri garden	Nutrigarden	4	61	0.70				3477	3.49		
	Grand Total		343	118.08							



Integrated pest and disease management of cabbage (KVK, Kolar)



IPM practices in Tomato (KVK, Davanagere)



IPM in Onion (KVK, Vijayapura-I)



Nutri garden (KVK, Hassan)

Kerala

A total of 107 demonstrations were implemented by KVKs of Kerala in vegetable crops such as amaranthus, bitter gourd, cucumber, cabbage, french bean, okra, yard long bean and tomato covering an area of 8.56 ha, mostly in the homestead farming situation (Table 28). In amaranthus, the Vaika variety recorded a green leaf yield of 194.10 q/ha as compared to 146.00 q/ha in farmers' practices. IDM technology demonstration in bitter gourd gave 168.05q/ha as compared to 150.75 q/ha in farmers' checks. In cucumber, organic pest management demonstration recorded yield of

23.72 q/ha over check with only 15.00 q/ha. In frenchbean , varietal demonstration Arka Sharath gave 5.97 /ha as compared to 4.82 q/ha in farmers' practices. Okra under micronutrient management resulted in a higher yield (112.80 q/ha) as compared to farmers' practice (102.60 q/ha). In yard long bean, technologies such as micro nutrient management, IDM, INM-Nano fertilizers, organic pest management and variety demonstration of PGCP -6 demonstrated in farmers' fields gave an average increased yield of 34.51 per cent over their local check. The highest yield of 204.00 q/ha was recorded under IDM demonstration.



Yard Long Bean Variety-PGCP -6 (KVK, Kannur)



Amaranthus Variety-KAU-Vaika-2 (KVK, Idukki)

Table 28: Frontline demonstrations on vegetable crops conducted by KVKs of Kerala

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Amaranthus	Varietal evaluation KAU Vaika	1	10	0.20	194.10	146.00	32.95	432526	2.30	287199	1.90
Bitter gourd	IDM	2	15	0.40	168.05	150.75	11.48	452124	2.40	320208	2.03
	Micro nutrient management	1	5	0.40	154.00	135.20	13.91	493280	2.15	419840	2.07
	Total/ average		20	0.80	163.37	142.98	14.26	490609	2.37	383218	2.13
Cucumber	Organic pest management	1	7	0.06	23.72	15.00	58.13	160050	1.82	44250	1.24
French bean	Varietal demonstration Arka Sharath	1	10	2.00	5.97	4.82	23.96	50806	1.74	33980	1.55
Okra	Micro nutrient management	1	5	0.40	112.80	102.60	9.94	322624	2.34	254820	1.99
	Disease resistant variety	1	10	0.50	135.00	80.00	68.75	242500	3.55	105000	2.11
	Protected cultivation	1	5	0.20	190.20	82.00	131.95	559937	2.15	-70414	0.86
	Total/ average		20	1.10	146.00	88.20	65.53	375020	2.37	96469	1.33
Yard Long Bean	Micro nutrient management	2	10	1.00	130.20	105.60	26.07	458360	2.71	358660	2.38
	IDM	1	10	0.20	204.00	160.00	27.50	661500	2.18	326250	1.67
	INM-Nano fertilizers	1	5	1.00	156.20	112.40	38.97	221897	2.32	100300	1.67
	Organic pest management	1	5	0.20	175.26	139.74	25.42	343797	1.65	149353	1.27
	Variety demonstration PGCP -6	1	10	2.00	72.35	30.90	134.14	46390	2.15	11800	1.47
	Total/ average		40	4.40	147.60	109.73	34.51	365051	2.19	217504	1.75
	Grand total		107	8.56							

3.1.2.9 Tuber crops

A total of 70 demonstrations were conducted on major tuber crops like potato, cassava, sweet potato and lesser yam covering an area of 7.18 ha by the KVKs of ATARI Bengaluru. State and technology wise results are discussed below:

Karnataka

A total of 24 demonstrations were conducted in elephant foot yam, potato and sweet potato covering an area of 4.20 ha by the KVKs of Karnataka (Table 29). Elephant foot yam under ICM gave higher yield of 418.50/ha as compared to 365.00 q/ha in farmers' practices. Variety demonstration

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

Crop	Production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Elephant foot yam	ICM	1	5	0.20	418.50	365.00	14.66	348900	2.16	239500	1.89
Potato	Variety demonstration Kufri Himalini	1	10	2.00	369.00	298.00	23.83	330300	3.94	227600	2.75
	INM	1	5	1.00	261.10	222.50	17.35	189650	1.94	133750	1.67
	Total/average		15	3.00	315.05	260.25	21.06	259975	2.65	180675	2.10
Sweet Potato	Varietal demonstration -Sree Bhadra	1	4	1.00	150.00	120.00	25.00	200000	4.33	150000	4.00
	Grand total		24	4.20							

Kufri Himalini in potato led to 23.83 % increased yield (369.00 /ha) over check. In sweet potato the varietal demonstration of Sree Bhadra recorded higher yield of 150.00 q/ha as compared to check with 120.00 q/ha.

Kerala

A total of 46 technologies were demonstrated in tuber crops like amorphophallus, cassava, sweet potato and taro in 2.98 ha area by the KVKs of Kerala (Table 30). IPDM demonstration in amorphophallus recorded higher yield of 542.40 q/ha as compared to checks. In cassava, demonstrations on bio-intensive disease management and bio-intensive wild boar management recorded increased yield of 78.11 per cent and 34.20 per cent, respectively over farmers’ practice. Bio-fortified sweet potato variety Bhu Krishna gave slightly lower tuber yield (90.00q/ha) . Variety demonstration Muktakeshi in taro led to 29.23 per cent increased yield (203.70 q/ha) over check.



ICM in Elephant foot yam (KVK, Udupi)



Cassava Mosaic Resistant variety Sree Raksha (KVK, Idukki)



IPDM in Amorphophallus (KVK, Malappuram)

Table 30: Frontline demonstrations on tuber crops conducted by KVKs of Kerala

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	(% Increase	Demo		Check	
								Net return	BCR	Net return	BCR
Amor phop hallus	IPDM	1	5	0.10	542.40	412.60	31.46	463980	6.91	337150	5.47
	Bio- intensive disease manag ement	1	5	0.10	338.40	190.00	78.11	553200	2.20	283705	1.59
	Improved variety Sree Reksha	1	5	0.20	289.00	226.00	27.88	376396	2.87	259630	2.34
Cassava	Improved variety Sree Pavithra	1	5	0.20	256.00	229.00	11.79	212200	2.24	176308	2.05
	Short duration HYV Shree Jaya		6	0.24	152.50	140.00	8.93	105000	1.53	80000	1.40
	Bio- intensive wild boar manag ement	1	5	2.00	328.80	245.00	34.20	524400	2.14	253705	1.53
	Total/ average		26	2.74	272.94	206.00	32.50	354239	2.18	210670	1.69
Sweet Potato	Bio- fortified sweet potato variety- Bhu Krishna	1	5	0.12	90.00	120.00	-25.00	85000	1.31	205000	1.75
Taro	Varietal evaluation Muktakeshi	1	10	0.02	203.70	157.62	29.23	490200	1.93	265420	1.51
	Grand Total		46	2.98							

3.1.2.10 Fruit crops

A total of 223 demonstrations on major fruit crops like banana, cashew, custard apple, fig, guava, grapes, lime, mango, pomegranate and ajwan were conducted by KVKs ATARI Bengaluru covering an area of 79.20 ha during the year. State and technology wise results are discussed in the foregoing discussions.

Karnataka

A total of 202 demonstrations on various fruit crops were conducted in farmers' fields covering 78.40 ha area (Table 31). Results indicated that the fruit yield was substantially higher under demonstrations of ICM, IPDM and INM technologies in banana. Among the technologies demonstrated in banana, IDM in yelakki registered a highest yield of 450q/ha followed by INM in putta baale with higher economic benefits as compared to their check. In cashew, plant

Protection technology demonstration gave higher yield of 15.25 q/ha as compared to check (10.00 q/ha). Cropping system technology demonstration in custard apple gave 94.44 Per cent higher yield (140.00 /ha) over check. In fig, ICM technology demonstration gave fig yield of 125.00 leading to higher net profits as compared to farmers' practice. IDM technology demonstration in grape recorded higher yield of 224.00 q/ha compared to check (184.00 q/ha). Demonstrated IPDM technology in guava gave 19.26 Per cent higher yield (119.50 q/ha) over check. In lime, IPDM gave higher lime yield 211.00 /ha as compared to 186.00 q/ha in the farmers' practices. In-situ green manuring in mango resulted in a higher yield (169.13 q/ha) as compared to farmer practice (155.90 q/ha). Pomegranate under IDM demonstration gave an increased yield of 33.47 per cent over local check. Variety demonstration Kadapa in ajwan recorded higher yield 10.70 q/ha as compared to farmer

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

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (Nuts/ha/year)			Economics (₹/ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Banana	ICM in putta baale	1	10	4.00	145.00	115.00	26.09	453325	2.80	280720	2.31
	INM in putta baale	1	5	1.00	340.00	260.00	30.77	307000	3.27	191500	2.31
	INM in yelakki	1	10	10.00	187.64	165.84	13.15	299300	2.76	247030	2.47
	IDM in yelakki	1	10	2.00	450.00	340.00	32.35	473000	3.35	335000	2.91
	IPDM	1	10	4.00	335.00	283.00	18.37	190000	1.90	77150	1.35
	ICM	1	5	1.00	59.25	40.14	47.61	213500	3.50	109250	2.19
	Total/ Average			50	22.00	252.82	200.66	25.99	322688	2.84	206775
Cashew	Plant Protection	1	10	4.00	15.25	10.00	52.50	128000	3.33	68000	2.31
Custard Apple	Cropping System	1	5	2.00	140.00	72.00	94.44	455000	5.33	126000	3.10
Fig	ICM	1	10	4.00	125.00	112.00	11.61	150000	1.91	95000	1.51
Grape	IDM	1	10	4.00	224.00	184.00	21.74	518000	4.36	360000	2.88

Guava	IPDM	1	10	4.00	119.50	100.20	19.26	143299	4.98	110755	3.80
Lime	IDM	1	10	4.00	190.78	151.06	26.29	132452	4.37	83901	2.89
	IPDM	1	10	4.00	211.00	186.00	13.44	205700	5.33	162800	4.19
	Total/ Average		20	8.00	200.89	168.53	19.20	169076	4.90	123351	3.58
Mango	ICM	5	52	17.20	112.26	95.67	17.34	161283	3.01	160554	2.91
	In-situ green manuring	1	10	4.00	169.13	155.90	8.49	169169	3.86	149965	3.48
	Total/ Average		62	21.20	140.70	125.79	11.85	162162	3.12	157656	2.97
Pomegranate	ICM	1	5	1.20	95.14	82.20	15.74	509380	3.02	422980	2.58
	IDM	1	10	4.00	160.30	120.10	33.47	475330	5.99	337830	4.94
	Total/ Average		15	5.20	127.72	101.15	24.61	492355	3.83	380405	3.15
Ajwan	Variety demon- stration- Kadapa	1	10	4.00	10.70	8.47	26.33	126000	3.79	87838	3.06
	Grand Total		202	78.40							



IDM in pomegranate (KVK, Vijayapura-I)



ICM in mango (KVK, Davanagere)

practices (8.47 q/ha).

Kerala

A total of 21 demonstrations were conducted by KVKs of Kerala on banana covering 0.80 ha during the year. The technologies such as ICM and IPM demonstrated in banana have performed better with an average yield of 184.04 q/ha as against their local checks (126.25q/ha). IPM demonstration in banana gave 188.08 q/ha fruit yield as compared to 97.50q/ha with check (Table 32).

3.1.2.11 Plantation crops

A total of 137 demonstrations were undertaken by KVKs of ATARI Bengaluru on major plantations like arecanut, coconut and coffee covering an area of 46.60 ha during the year. State and technology wise results are discussed below:

Karnataka

A total of 125 demonstrations on plantation crops like coconut, arecanut and coffee were conducted in 45 ha by the KVKs of Karnataka (Table 33). Coconut was demonstrated under technologies

Table 32: Frontline demonstrations on fruit crops conducted by KVKs of Kerala

Crop	Production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Banana	ICM	1	10	0.40	180.00	155.00	16.13	76500	1.31	-10000	0.96
	IPM	1	11	0.40	188.08	97.50	92.90	667636	2.45	220500	1.60
	Total/Average		21	0.80	184.04	126.25	45.77	774290	3.19	287650	1.96



Banana Pseudo stem weevil management (KVK, Alapuzha)



ICM in banana (KVK, Trivandrum)

such as ICM, INM and IPM in the farmers' fields covering an area of 20 ha during the year. Among different technologies, coconut under ICM technology recorded higher nuts (10560 nut/ha) followed by INM technology (9045 nut/year) compare to check. Arecanut under INM and ICM technologies resulted higher yield of 15.55 q/ha

and 20.60 q/ha with net profit of ₹. 359500/ha and ₹. 773394/ha, respectively. In coffee, INM and IDM technologies demonstrated in farmers' fields have given an overall 12.98 per cent and 22.80 per cent higher yield with 23.50 q/ha/year and 37.48q/ha/year, respectively.

Table 33: Frontline demonstrations on plantation crops conducted by KVKs of Karnataka

Crop	Production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Coconut (Nut / year)	ICM	1	20	8.00	10560	8540	23.65	122800	4.45	80040	2.67
	INM	1	10	2.00	9045	7481	20.91	118610	3.68	74367	2.64
	IPM	1	25	10.00	7150	5280	35.42	54050	2.70	34865	2.22
	Total/Average		55	20.00	8918	7100	25.60	98487	3.65	63091	2.55

Arecanut	INM	3	25	5.00	15.55	12.60	23.57	359500	3.94	279000	3.36
	ICM	1	25	16.00	20.60	12.74	61.70	773394	6.02	442279	4.38
	Total/ Average		50	21.00	18.08	12.67	42.63	566447	4.98	360640	3.87
Coffee	INM	1	10	2.00	23.50	20.80	12.98	119590	2.41	80110	1.79
	IDM	1	10	2.00	37.48	30.52	22.80	195699	3.02	145770	2.58
	Total/ Average		20	4.00	30.49	25.66	18.82	157645	2.74	112940	2.17
Grand total			125	45.00							



ICM in arecanut (KVK, Davanagere)



IPM in coconut (KVK, Dakshina Kannada)

Kerala

The important plantation crop of Kerala i.e., coconut was demonstrated under technologies such as INM and integrated farming system in the fields of farmers covering an area of 1.60 ha during the year (Table 34). These technology demonstrations in coconut gave higher net profit of ₹. 75460 /ha and ₹. 92100 /ha, respectively.



Coconut (KVK, Palakkad)

Table 34: Frontline demonstrations on plantation crops conducted by KVKs of Kerala

Crop	Production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	(% Increase)	Demo		Check	
								Net return	BCR	Net return	BCR
Coconut	INM	1	8	1.00	8160.00	5760.00	41.67	75460	2.45	52550	2.00
	Integrated Farming System	1	4	0.60	-	-	-	92100	2.36	11000	2.10
Total			12	1.60							

3.1.2.12 Spice crops

A total of 251 demonstrations were conducted in major spices like black pepper, garlic, ginger, turmeric and dry chilli covering an area of 62.68 ha by the KVKs of ATARI Bengaluru. State and technology wise results are discussed below:

Karnataka

In spices, a total of 171 demonstrations were conducted in black pepper, chilli, ginger and turmeric covering an area of 55.50 ha during the year (Table 35). IDM technology demonstration in black pepper gave higher dry pepper yield of 12.57q/ha as compared to farmers' practice. In ginger, improved technology such as ginger in agroforestry

system, ginger special, ICM, good management practices and IDM were demonstrated in farmers' fields. Among the different technologies, ginger in agroforestry system recorded higher yield of 503.70 q/ha as compared to farmers practices. Improved variety- IISR Pragathi and intercropping in areca plantation technologies demonstration in turmeric recorded higher yield of 56.71, which was 14.61per cent increase over control. In chilli, IPDM, IDM, IPM and varietal introduction (ChUASr-42) technologies were demonstrated in farmer's field. Among different technologies, IDM recorded higher yield of 30.25q/ha dry chilli yield, which was 16.93 Per cent higher over check.

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

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Yield (q/ha)		Net return	BCR	Check		
					Demo	Check			(%) Increase	Net return	BCR
Black pepper	IDM	1	5	2.50	12.57	8.98	39.98	359222	5.02	242010	4.08
Ginger	In agro forestry system	1	5	1.20	503.70	467.70	7.70	573325	2.02	400500	1.76
	Ginger special for higher yield	3	20	10.00	418.25	371.90	13.34	345920	1.79	257922	1.60
	Good practices in ginger	1	15	6.00	229.50	211.50	8.51	145550	1.73	110750	1.54
	ICM	1	10	4.00	180.00	140.00	28.57	270000	5.91	200000	3.50
	IDM	1	10	2.00	149.25	118.75	25.68	118755	1.66	68604	1.41
	Total/ Average			60	23.20	296.14	261.97	13.04	290710	2.02	207555
Tur meric	Improved variety- IISR Pragathi	2	17	3.20	56.71	46.24	26.97	245085	2.24	139721	1.72

	Inter cropping in areca plantation	1	20	2.00	14.61	-	-	207450	3.44	-	-
	Total/Average		37	5.20	56.71	46.24	26.97	232540	2.45	139721	1.72
Chilli	IPDM	3	29	11.60	8.11	6.42	26.32	182590	3.19	119775	2.40
	IDM	1	10	4.00	30.25	25.87	16.93	282000	2.07	157660	1.51
	IPM	2	20	8.00	28.25	23.26	21.81	357022	2.84	227032	2.06
	varietal introduction- Leaf Curl Virus resistant variety ChUAS r-42	1	10	1.00	18.18	15.60	16.54	298400	5.59	242000	4.46
	Total/Average		69	24.60	21.20	17.79	19.17	280004	2.85	186616	2.10
	Grand Total		171	55.50							



IPM in chilli (KVK, Koppal)



IDM in black pepper (KVK, Udipi)



IDM in ginger (KVK, Uttar Kannada)

Kerala:

A total of 80 demonstrations were implemented in black pepper, garlic, ginger and turmeric crops by KVKs of Kerala covering 7.18 ha & 20 units (Table 36). Disease management and INM technologies demonstration in black pepper recorded 22.08 per cent and 14.71 per cent increased yield over their control. Demonstration of INM technology in garlic recorded higher yield of 207.50 q/ha

compared to farmers practices (160.00q/ha). In ginger, ginger transplants, production of healthy ginger seeds, INM and Chitra varietal introduction demonstrations gave higher yield of 250.00 q/ha, 181.29 q/ha, 138.50 q/ha and 210.00q/ha, respectively as compared to their respective check. INM demonstration in turmeric gave 200.50 q/ha fruit yield as compared to check (169.20 /ha).

Table 36: Frontline demonstrations on spice crops conducted by KVKs of Kerala

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (Nuts/ha/year)			Economics (₹/ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Black Pepper	Disease manag ement	1	10	2.00	20.29	16.62	22.08	453840	2.63	281840	2.13
	INM	1	5	2.50	9.75	8.50	14.71	437500	9.75	375000	8.50
	Total/ Average		15	4.50	15.02	12.56	19.59	445670	3.72	328420	3.19
	Cultivation of bush pepper [Yield per plant per year (dry) (kg)]	1	20	20 units	0.27	-	-	49.75 (Rs. per plant per year)	1.83		
	Total		35	4.50 20 units							
Garlic	INM	1	5	1.00	207.50	160.00	29.69	1018000	2.60	655600	2.05
Ginger	Ginger transplants	1	5	0.10	250.00	210.00	19.05	161600	2.83	106000	2.02
	Production of healthy ginger seeds	1	5	0.08	181.29	135.15	34.14	956250	2.12	384650	1.69
	INM	1	5	1.00	138.50	105.00	31.90	315864	2.90	174294	2.23
	New variety demon stration Chitra	1	5	0.10	210.00	150.00	40.00	655000	2.31	325000	1.65
	Total/ Average		20	1.28	194.95	150.04	31.27	522179	2.30	247486	1.76
Tur- meric	INM	1	20	0.40	200.50	169.20	18.50	180850	1.43	91650	1.22
	Grand total		80	7.18 20 units							



INM in garlic (KVK, Idukki)



INM in turmeric (KVK, Alapuzha)

3.1.2.13 Flower crops

A total of 56 demonstrations on flower crops covering an area of 8.56 ha were implemented by the KVKs ATARI Bengaluru of during the year. State and technology wise results are discussed in foregoing discussion.

Karnataka

Demonstrations were conducted in flower crops such as chrysanthemum, jasmine, marigold, rose and tube rose covering an area 8.40 ha by the KVKs of Karnataka (Table 37). Demonstration of

IPDM in chrysanthemum recorded higher yield of 147.00 q/ha with BCR of 3.30 as compared to check. Half-season flower induction technology in jasmine has given 15.00 per cent higher yield (0.69 q/ha) as compared to 0.60 q/ha in check. Demonstration of precision farming technology in marigold recorded higher yield of 182.00 q/ha and 138.00 q/ha flower yield as compared to check. IPD M demonstrated in rose gave higher yield of 239.20 q/ha as compared to check. Demonstration of ICM technology in tube rose recorded higher yield 145.00/ha as compared to check.

Table 37: Frontline demonstrations on flower crops conducted by KVKs of Karnataka

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹./ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Chrys- anthe- mum	IPDM	1	10	4.00	147.00	107.40	36.87	404500	3.30	112660	1.57
Jas- mine	Half season flower induction	1	10	0.20	0.69	0.60	15.00	203500	2.59	111153	1.94
Mari- gold	Precision farming	1	7	0.70	182.00	138.00	31.88	105382	2.20	166938	2.90
Rose	ICM	1	12	2.00	121.60	84.20	44.42	244800	3.04	152600	2.91
	IPDM	1	5	1.00	239.20	197.60	21.05	711050	3.89	430861	2.65
	Total/ Average		17	3.00	180.40	140.90	28.03	477925	3.61	291731	2.71
Tube- rose	ICM	1	5	0.50	145.00	90.90	59.52	521250	2.49	272250	2.00
	Grand total		49	8.40							



FLD on chrysanthemum (KVK, Mandya)



IPDM in rose (KVK, Bengaluru rural)



ICM in Tube rose (KVK, Haveri)

Kerala

Varietal evaluation-Pusa Bahar demonstration was conducted in marigold covering an area of 0.16 ha by the KVKs of Kerala (Table 38). Demonstration of Pusa Bahar technology in marigold have recorded higher yield of 190.77 q/ha as compared to check (150.20 q/ha).

Table 38: Frontline demonstrations on flower crops conducted by KVKs of Kerala

Crop	Variety/ production technology	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	Increase (%)	Demo		Check	
								Net return	BCR	Net return	BCR
Marigold	Varietal evaluation- Pusa Bahar	1	7	0.16	190.77	150.20	27.01	716848	2.53	443848	1.95
	Total		7	0.16							



FLD on marigold (KVK, Ernakulam)

3.1.2.14 Demonstrations on hybrids

During the year, 338 demonstrations on hybrids in various crops like maize, pearl millet, sweet corn, sunflower, castor, marigold, chilli, Bt. Cotton, tomato, Okra, brinjal, bitter gourd, cabbage, cauliflower, dolichos bean, tube rose, ridge gourd, salad cucumber and watermelon were conducted by the KVKs of ATARI Bengaluru covering 113.90 ha area. Crop and hybrid wise results are presented as under:

Karnataka

Demonstrations on hybrids conducted by KVKs of Karnataka are presented in Table 39. In maize, private hybrids gave higher yield ranging from 3.27 per cent to 13.21 per cent over check hybrids. In Pearl millet, VPMH-14 hybrid recorded higher yield of 18.20 q/ha as compared to check. Sweet corn hybrid, Mithas recorded higher yield of 98.50 q/ha as compared to 89.00q/ha in farmers' variety. Sunflower hybrid RSFH 1887 was demonstrated in 15 farmers' fields covering 6.00 ha performed superior by recording 21.73 per cent higher sunflower yield with higher BCR (2.68) as compared to check. In castor and marigold hybrids have recorded higher yield (19.20 q/ha & 62.00q/ha, respectively) as compared to farmers'

variety. In green chilli, Arka Haritha, KBCH-1 and Arka Tejasvi hybrids were demonstrated in farmers field. Among the three hybrid KBCH-1 recorded 26.55 per cent higher yield (286.00 q/ha) over check (226.00 q/ha). In dry chilli, hybrids Arka Haritha (26.70 q/ha), private hybrid (40.75 q/ha), Arka Kyathi (23.75 q/ha) and UASRCh42 (13.95 q/ha) have performed superior to their check varieties. In cotton, Navaneet(bt) hybrid recorded higher yield of 22.20q/ha as compared to check. In tomato, Arka Abhed (338.13 q/ha) and private hybrid (587.00 q/ha) have performed better than their check hybrids and gave better economic returns to the farmer. Okra hybrid, Arka Nikitha recorded higher yield of 158.46 q/ha as compared to 124.60 q/ha in farmers' variety. In bitter gourd private hybrid (166.20 q/ha) has performed superior to their check (140.70 q/ha). Ujwal hybrid in brinjal recorded higher yield of 187.00 q/ha with net returns of ₹. 753444/ha. The performance of hybrids such as Radha in cabbage, Dhaval in cauliflower, Radhe in cucumber, and Kalash in watermelon were superior to their check varieties. Arka Prajwal hybrid in tuberose, Arka Sambhram in Dolichos bean demonstration have recorded higher yield of 775.00 q/ha and 18.45 q/ha with net returns of ₹.93815/ha and ₹.46750/ha, respectively.

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

Crop	Name of hybrid	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	(% Increase)	Demo		Check	
								Net return	BCR	Net return	BCR
Maize	NS-8585	1	5	1.00	73.36	64.80	13.21	93815	2.46	78115	2.27
	DKC-9178	1	5	1.00	72.70	70.40	3.27	97544	2.60	91611	2.48
	Bt hybrids	6	66	27.20	51.95	46.21	12.42	32861	1.53	29817	1.51
Pearl millet	VPMH-14	1	10	4.00	18.20	11.80	54.24	25200	1.75	9020	1.46
Sweet corn	Mithas	1	5	1.00	98.50	89.00	10.67	64800	2.54	78200	2.96
Sunflower	RSFH 1887	1	15	6.00	10.98	9.02	21.73	35427	2.68	19086	1.70
Castor	ICH-66	1	24	10.00	19.20	16.25	18.15	65000	3.10	50250	2.62
Marigold	Arka Abhi	1	5	1.00	62.00	51.60	20.16	300580	4.93	163150	3.10

Kerala

A total of 10 demonstrations on hybrids were conducted by the KVKs of Kerala are presented in Table 40. In ridge gourd, KRH-1 hybrid demonstrated gave higher yield of 177.00 q/ha over check varieties (139.00 q/ha). Demonstration of salad cucumber hybrid Shubhra recorded a higher yield of 269.00 q/ha as compared to 234.00 q/ha in farmers' variety.

Table 40: Frontline demonstrations on hybrids conducted by KVKs of Kerala

Crop	Name of hybrid	KVKs (No.)	Farmers (No.)	Area (ha)	Yield (q/ha)			Economics (₹/ha)			
					Demo	Check	(% Increase)	Demo		Check	
								Net return	BCR	Net return	BCR
Ridge gourd	KRH1	1	5	0.20	177.00	139.00	27.34	192500	1.77	97500	1.39
Salad cucumber	Shubhra	1	5	0.20	269.00	234.00	14.96	350000	2.49	172500	1.69
Total			10	0.40							



Ridge gourd hybrid KRH 1(KVK, Ernakulam)



Salad Cucumber hybrid Shubra (KVK, Ernakulam)

3.1.2.15 Frontline demonstrations on farm implements/machinery

Farm mechanization was encouraged through 205 demonstrations on farm implements/machinery covering an area of 72.00ha during the year by the KVKs of ATARI Bengaluru. Statewise details of implements/machinery demonstrated are presented in the forgoing discussion.

Karnataka

Farm implements/machinery such as solar operated nipping machine in chickpea, drying of red chilies in solar and sunlight in vegetable crops, manually drawn onion seeder and battery operated onion detopper in onion, spiral separator in soybean, tractor operated baler in paddy and introduction of rotary mountages for quality cocoon production in sericulture were demonstrated covering an area of 41.00 ha and 105 farmers by eight KVKs of Karnataka (Table 41).

Table 41: Frontline demonstrations on farm implements conducted by KVKs of Karnataka

Crop	Name of the implement	KVKs (No.)	Farmers (No.)	Area (ha)
Chickpea	Solar operated nipping machine	1	25	2.50
Vegetable crops	Drying of red chillies in solar and sunlight	1	10	4.00
Onion	Manually drawn onion seeder	1	5	0.50
Onion	Battery operated onion detopper	2	20	8.00
Soybean	Spiral separator	1	10	4.00
Paddy	Tractor operated baler	1	10	4.00
Sericulture	Introduction of rotary mountages for quality cocoon production	1	5	10.00
Total			105	41.00



Solar operated nipping machine for chickpea (KVK, Belagavi-I)



Drying of red chillies in solar and sunlight (KVK, Raichur)

Kerala

Farm implements/machinery such as demonstration of drone technology in rice, home scale table top screw expeller for small scale oilseed enterprises and power tiller operated basin digger in coconut, portable high head sprinkler gun in fodder production, power operated nutmeg seed sheller in nutmeg, tractor drawn root harvester and solar drying for drying of fruits and vegetables were demonstrated covering an area of 59.00 ha and 167 farmers by the KVKs of Kerala (Table 42).



Demonstration of drone technology in paddy (KVK, Palakkad)

Table 42: Frontline demonstrations on farm implements conducted by KVKs of Kerala

Crop	Name of the implement	KVKs (No.)	Farmers (No.)	Area covered (ha)	
Paddy	Demonstration of Technology in paddy	Drone	4	67	28.00

Coconut	Home scale table top screw expeller for small scale oilseed enterprises	1	5	-
Coconut	Power tiller operated coconut basin digger	1	5	0.50
Fodder	Portable high head sprinkler gun in fodder production	1	4	0.40
Millet	Pedal operated millet dehuller	1	5	-
Nutmeg	Power operated nutmeg seed sheller	1	5	0.50
Turmeric	Tractor drawn root harvester	1	8	1.60
Vegetables	Solar drying for drying of fruits and vegetables	1	1	-
Total			100	31

3.1.2.16 Farm enterprises

A total of 290 demonstration units were established on farm enterprises such as agroforestry, apiculture, integrated farming, compost production, mushroom, poultry, sericulture, value addition, and others benefiting 768 farmers/farm women in the states of Karnataka and Kerala through KVKs of ATARI Bengaluru during the year. State-wise enterprises established are presented in Table 43 and Table 44.

Karnataka

A total of 226 demonstration units were established under various small scale income generating enterprises such as *Ylang-Ylang* based agroforestry system for perfume, cocoon production, entrepreneurship development in handicrafts using pierced cocoons, scientific approach in bee keeping *Apis cerana indica*, compost production, value addition to mango, ginger, banana, jackfruit, spice, tamarind, coconut, millets, chilli, fig, soybean, pineapple and jaggery preparation benefitting 627 farmers/farm women in the state of Karnataka.

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

Category	Name of the technology demonstrated	KVKs (No.)	Farmers (No.)	Units (No.)
Agroforestry	Ylang-Ylang based agroforestry system for perfume	1	3	1
Sericulture	Cocoon production	8	80	80
Cocoon handicrafts	Entrepreneurship development in handicrafts using pierced cocoons	1	10	1
Apiculture	Scientific approach in Bee keeping <i>Apis cerana indica</i>	2	10	10
Compost from seri farm waste	Quality compost production from seri farm residue using waste decomposer consortia	3	19	19
Compost	KSNUAHS compost culture for compost preparation	1	25	25

Vermicompost	Decomposition of Areca husk for value added compost	1	20	20
Mango value addition	Safe ripening , Branding and Marketing for mango	2	6	6
Ginger value addition	Value addition to ginger	1	30	2
Banana value addition	Value addition and marketing linkage to banana and banana pseudostem	5	160	9
Jackfruit value addition	Jackfruit value added products	1	5	1
Spices value addition	Processing of Spices and value addition, Labelling, packaging and marketing under ODOP	1	10	1
Value addition	Liquid jaggery, herbal jaggery, jaggery powder	1	15	1
Tamarind value addition	EDP on tamarind processing and value addition	3	54	32
Coconut value addition	Value Addition, Branding and Market Linkage	2	60	3
Millet value addition	Home Scale enterprise: Millet and its health products	3	80	8
Chilli value addition	Value addition and marketing of chilli products	1	2	2
Fig value addition	Home-scale enterprise with fig and its products	1	4	2
Soybean value addition	EDP on soybean processing and value addition	1	10	1
Pineapple value addition	Preparation of pineapple Jam and candy	1	24	2
Total			627	226



Banana flower pickle preparation
(KVK, Uttar Kannada)



Tamarind processing and packing
(KVK , Belagavi-II)



Cocoon production (KVK, Bengaluru Rural)

Kerala

A total of 64 demonstration units were established by KVKs of Kerala under various small-scale enterprises on compost production, integrated farming, mushroom production, EDP on seed production, processing and value addition to jackfruit, fisheries, tapioca, millet, coconut, garcinia, banana, fruit and vegetable and honey benefiting 141 farmers/farm women in the state of Kerala.

Table 44: Frontline demonstrations on farm enterprises conducted by KVKs of Kerala

Category	Technology demonstrated	KVKs (No.)	Farmers (No.)	Units (No.)
Compost	Organic waste management	2	20	20
Integrated farming	Integrated Duck-Cage fish farming in public water body for landless farmers	2	7	7
Oyster mushroom	Ready to Fruit mushroom bags	1	10	5
EDP on seed production	Ginger and turmeric seed production, branding and marketing	1	1	1
Jackfruit value addition	Ready to cook dehydrated jack	2	14	6
Fisheries value addition	Value added products from mussels	1	5	2
Tapioca value addition	Value added products of Tapioca	3	30	6
Millet value addition	Multi Grain Nutri Mix Production for income generation	1	6	1
Coconut value addition	Coconut milk residue based pasta, coconut oil etc	2	13	5
Garcinia value addition	Demonstration on ready to use Garcinia paste	1	10	2
Banana value addition	Banana flour based value added products	1	10	2
Fruits and vegetables value addition	Scientific dehydration techniques for locally available fruits and vegetables	2	10	6
Honey value addition	Lip balm, face mask, honey amla, ginger honey, garlic honey	1	5	1
Total			141	64



EDP on organic manure production, branding and marketing (KVK, Ernakulam)



EDP on mushroom cultivation (KVK, Idukki)

3.1.2.17 Livestock

A total of 209 demonstration units in livestock including poultry were established benefiting 785 farmers/farm women during the year by the KVKs of ATARI bengaluru in State of Karnataka and Kerala. State and enterprise wise results are given below.

Karnataka

A total of 47 demonstration units in livestock comprising 26 in dairy, 6 in poultry, 8 in piggery and 15 in sheep and goat were demonstrated during the year. In dairy, technologies such as integrated reproductive management for anestrus in cattle, integrated approaches for dairy calf management, disease management, clean milk production procedures for management of subclinical mastitis in dairy animals, probiotics to enhance SNF and milk yield, ecto-parasiticides to control tick infestation in cattle, nutrition management, scientific dairy

management, green fodder management, AI using sexed semen of HF for economic security, integrated disease management, supplementation of bypass fat for higher milk and fat yield in buffaloes, thermal stress management in buffaloes and different technologies on augmenting fertility in dairy buffaloes were demonstrated benefiting 342 farmers and covering 493 animals. Red spectrum of light on reproductive performances in poultry layer under normal management practices and duckery for additional income were demonstrated in poultry covering 15 farmers and 125 poultry birds. In piggery, integrated piggery management demonstration was conducted by involved 15 covering 120 animals. In sheep and goat, integrated health management in sheep and balanced nutrition and deworming in sheep were demonstrated covering 985 animals of 140 farmers (Table 45).

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

Thematic area	Name of the technology demonstrated	No of KVKs	No. of Farmers	No. of units	Total no of animals
Dairy					
Cow	Integrated reproductive management for anestrus in cattle	1	5	5	25
Cow	Integrated approaches for Dairy Calf Management	1	10	2	20
Cow	Disease management in dairy animals	9	95	2	161
Cow	Clean milk production procedures for management of subclinical mastitis	1	10	1	10
Cow	Probiotics to enhance SNF and milk yield	2	15	1	15
Cow	Ecto-parasiticides to control tick infestation in cattle	1	10	1	10
Cow	Nutrition management	4	42	2	67
Cow	Scientific dairy management	4	40	1	50
Cow	Green fodder management	3	30	1	30
Cow	AI using sexed semen of HF for economic security	1	20	2	20
Buffalo	Integrated Disease Management	4	40	1	40
Buffalo	Supplementation of bypass fat for higher milk and fat yield in buffaloes	1	5	5	25
Buffalo	Thermal Stress Management in buffaloes	1	10	1	10
Buffalo	Different technologies on augmenting fertility in Dairy Buffaloes	1	10	1	10
	Total		342	26	493

Poultry					
Poultry	Red spectrum of light on reproductive performances in poultry layer under normal management practices	1	10	1	100
Duckery	Duckery for additional income	1	5	5	25
	Total		15	6	125
Piggery					
Piggery	Integrated piggery management	2	15	8	120
Sheep and Goat					
Sheep and goat	Integrated health management in sheep	3	25	7	160
Sheep and goat	Balanced nutrition and deworming in Sheep	12	115	8	825
	Total		140	15	985
	Grand total		497	47	1603



Duckery for additional income (KVK, Hassan)



Poultry farming (KVK, Kodagu)

Kerala

A total of 162 demonstration units comprising 18 in dairy, 125 in poultry and 22 in sheep and goat were conducted during the year covering 673 animals and 2540 poultry birds of 288 farmers (Table 46). In dairy, cultivation and feeding of hybrid napier var. Co-3 + CoFS 29 + Co FC 8 in the ratio of 10:5:3, ultra-high density moringa planting as forage for cows, feed additives to improve milk Qty and milk composition in dairy cattle, use of Ketocheck kit to diagnose sub clinical ketosis and its management using Rumen By pass fat in early lactation period, disease management in dairy cows, controlled breeding in repeat breeder cows by using CIDR+PGF2 +GnRh, trisodium citrate in subclinical mastitis in milch cows, pineapple silage as total mixed ration in dairy animals and surf field mastitis test – easy, reliable and farmers

friendly test to detect subclinical mastitis in dairy farms technologies were demonstrated covering 347 animals of 180 farmers. In poultry, Vigova broiler duck variety for meat, azolla as economic feed supplement in ducks for increasing egg production, backyard poultry production, scientific poultry feeding and Thalassery breed of chicken for backyard poultry rearing system technologies were demonstrated involving 98 farmers covering 2540 poultry birds. In sheep and goat, performance of growing Malabari female goats under KVASU grower feed, integrated health management in kids, TANUVAS goat mineral mixture for post weaning growing kids, Bypass fat in feed to counteract does body weight and growth performance of their Suckling kids and improved weight gain in kids by supplementing kid starter were demonstrated involving 50 farmers and covering 296 animals (Table 46).

Table 46: Frontline demonstrations on livestock conducted by KVKs of Kerala

Thematic area	Name of the technology demonstrated	No of KVKs	No. of Farmers	No. of units	No of animals
Dairy					
Cow	Cultivation and feeding of Hybrid Napier var. CO 3 + CO FS 29 + CO FC 8 in the ratio of 10:5:3	1	15	2	30
Cow	Ultra-high density Moringa planting as forage for cows	1	5	1	5
Cow	Feed additives to improve milk Qty and milk composition in dairy cattle	1	5	5	25
Cow	Use of Ketocheck kit to diagnose sub clinical ketosis and its management using Rumen By pass fat in early lactation period	1	20	1	20
Cow	Disease management in dairy cows	5	40	4	147
Cow	Controlled breeding in repeat breeder cows by using CIDR+PGF2 +GnRh	1	50	1	50
Cow	Trisodium citrate in subclinical mastitis in milch cows	1	25	2	50
Cow	Pineapple silage as total mixed ration in dairy animals	1	10	1	10
Cow	Surf field mastitis test – easy, reliable and farmers friendly test to detect subclinical mastitis in dairy farms	1	10	1	10
	Total		180	18	347
Poultry					
Duckery	Vigova Broiler duck variety for meat	1	4	50	200
Duckery	Azolla as economic feed supplement in Ducks for increasing egg production	1	4	10	40
Poultry	Backyard poultry production	3	40	45	1800
Poultry	Scientific Poultry Feeding	3	40	10	400
Poultry	Thalassery breed of chicken for backyard poultry rearing system	1	10	10	100
	Total		98	125	2540
Sheep and Goat					
Sheep and goat	Performance of growing Malabari female goats under KVASU Grower feed	1	20	10	200
Sheep and goat	Integrated health management in kids	1	10	5	50
Sheep and goat	TANUVAS goat mineral mixture for post weaning growing kids	1	5	2	10

Sheep and goat	Bypass fat in feed to counteract does body weight and growth performance of their Suckling kids	1	10	2	20
Sheep and goat	Improved weight gain in kids by supplementing kid starter	1	5	3	16
	Total		50	22	296
	Grand total		288	162	3821



FLD on dairy management (KVK, Alapuzha)



Integrated health management in kids (KVK, Kannur)

Lakshadweep

Demonstration of poultry breed Thalassery as a source of family income was undertaken in four farmer's households in the Island during the year (Table 47).

Table 47: Frontline demonstrations on livestock conducted by KVK Lakshadweep

Thematic area	Name of the technology demonstrated	No. of Farmers	No. of units
Poultry			
Poultry	Demonstration of poultry breed Thalassery	4	4
	Total	4	4

3.1.2.18 Fisheries

A total of 163 demonstration units in fisheries were established benefiting 165 farmers/farm women during the year by the KVKs of ATARI Bengaluru in the state of Karnataka and Kerala. State and technologies wise results are given below.

Karnataka

A total of 96 demonstrations were conducted on composite fish farming, monoculture of amur common carp in farm ponds, tilapia fish

for additional returns, fish culture in acidic water bodies -common carp & grass carp (3:1), pangasius in farm pond, seabass in farm ponds and GIFT tilapia farming in biofloc technologies by involving 96 farmers and supplied 161350 fingerlings (Table 48).

Table 48: Frontline demonstrations on fisheries conducted by KVKs of Karnataka

Category	Thematic area	Name of the technology demonstrated	No. KVK	No. of Farmers	No. of units	Size of the unit (m2)	No of fingerlings
Common carps	Composite fish farming	Composite fish farming	9	54	54	4211	109800
Common carps	Varietal performance	Monoculture of amur common carp in farm ponds	2	10	10	585	9000
Tilapia	Varietal evaluation	Tilapia Fish for additional returns	2	15	15	2500	16800
Fisheries	Fish farming in acidic water bodies	Fish culture in acidic water bodies -Common carp & Grass carp (3:1)	1	5	5	500	5250
Inland fish farming	Diversification	Pangasius in farm pond	1	5	5	860	7500
Inland fish farming	Diversification	Seabass in farm ponds	1	3	3	240	1000
Inland fish farming	Diversification	GIFT Tilapia farming in Biofloc	1	4	4	7 biofloc Tanks each	12000
		Total		96	96		161350



Composite fish farming (KVK, Haveri)



Harvesting of fish (KVK, Belagavi-II)

Kerala

In fisheries, technologies such as ICAR CIFA improved catla for freshwater farming, integrating fish and duck farming in homestead pond, scientific farming of milk fish, culture of snake head fish (Murrels), Opheocephalus (Varaal) fish in homestead pond, monoculturing of Gift tilapia fish, ICAR CIFT modified drying technology for shelf life enhancement of prawns, fish seed rearing

in cages, scientific farming of improved strains of Nile tilapia, scientific shrimp farming with water acidity management, brackish water aquaculture using plankton plus, culture of brackish water fishes in pen, emamectin benzoate treatment to eliminate Caligus minimus in pearlspot and polyculture were demonstrated in 67 units and benefited 69 farmers (Table 49).

Table 49: Frontline demonstrations on fisheries conducted by KVKs of Kerala

Category	Thematic area	Name of the technology demonstrated	No of KVKs	No. of Farmers	No. of units	Size of the unit (m2)	No of fingerlings
Common carps	Varietal demonstration	ICAR CIFA improved catla for freshwater farming	2	6	6	1379	8250
Fish based IFS	Homesteads for higher income	Integrating fish and duck farming in homestead pond	2	11	11	352	4028
Milk fish	Species diversification	Scientific farming of milk fish	1	2	1	2000	4000
Murrels	Freshwater aquaculture	Culture of snake head fish (Murrels)	1	5	5	84	400
Aquaculture	Aquaculture	Opheocephalus (Varaal) fish in homestead pond	3	17	17	272	4970
Gift Tilapia fish	Production and management	Monoculturing of Gift Tilapia fish	1	5	5	101.16	3300
Gift Tilapia fish	Value addition	ICAR CIFT modified drying technology for shelf life enhancement of prawns	1	4	4	300 kg	300 kg fresh prawn
Fish seed production	Nursery rearing	Fish seed rearing in cages	1	2	2	4000	25000
Freshwater aquaculture	Scientific farming	Scientific farming of improved strains of Nile tilapia	1	3	3	101.7	580
Brackish water aquaculture	Shrimp farming, P.vannamei	Scientific shrimp farming with water acidity management	1	3	3	1000	10000
Brackish water aquaculture	Brackish water aquaculture	Brackish water aquaculture using plankton plus	1	2	2	10000	5000
Brackish water aquaculture	Brackish water aquaculture	Culture of brackish water fishes in pen	1	5	5	1388	1600
Pearl spot fishes (Etroplus suratensis)	Aquaculture	Emamectin benzoate treatment to eliminate Caligus minimus in Pearlsport.	1	2	2	2000	4000
Seabass	Aquaculture	Polyculture	1	2	1	1200	4800
		Total		69	67		75928



Varaal fish in homestead pond (KVK, Alapuzzha)

3.1.2.19 Women and Children empowerment programmes

A total of 815 programmes on empowerment of women and children were conducted by the KVKs of ATARI Bengaluru with participation of 44363 women and children. Details are provided in Table 50. KVKs of Karnataka have organized 474 programmes for the empowerment of women during the year covering 21919 women participants. Similarly, 28 programmes on health and nutrition and other children related aspects with participation of 1529 children. In case of Kerala, KVKs organized 283 programmes on empowerment of women during the year with participation of 19660 women. Similarly, 30 programmes on health and nutrition and other children related aspects were organized covering 1255 children.

Table 50: Details of women and children empowerment programmes implemented by KVKs of Zone -XI

Category	Name of the programme	No of KVKs	No of programmes	No of Participants
Karnataka				
Women	Awareness programmes	12	91	5420
	Coconut tree climbing	5	10	117
	Drudgery Reduction	9	27	581
	Enterprises	13	50	1577
	Farming System	8	38	854
	Health and nutrition	17	49	1790
	Kitchen Garden	10	36	805
	Nutrigarden	18	69	2674
	Storage Technique	7	26	253
	Value addition	17	62	2002
	Women Empowerment	11	75	4044
	Others	6	533	1802
	Total			474
Children	Health	8	19	1043
	Others	5	9	486
	Total		28	1529
Grand Total			502	23448

Kerala				
Women	Awareness programmes	5	38	13840
	Coconut tree climbing	3	6	145
	Drudgery Reduction	2	3	86
	Enterprises	2	21	223
	Farming System	2	28	550
	Health and nutrition	4	13	585
	Kitchen Garden	2	6	118
	Nutrigarden	5	16	388
	Storage Technique	1	3	18
	Value addition	5	70	1643
	Women Empowerment	4	46	927
	Others	3	33	1137
	Total		283	19660
Children	Health	4	11	292
	Others	4	19	963
	Total		30	1255
Grand Total		313	20915	



School children in active interaction with resource persons (KVK, Ballari)



Training programme on nutrigarden (KVK, Chamarajanagara)



Training programme on value addition (KVK, Palakkad)

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 of Zone-XI have conducted various capacity development courses for different category of participants representing farmers, farm women, rural youth, extension personnel

Table 51: State and participant category wise capacity development courses conducted by KVKs of Zone-XI

State	Participant category and capacity development courses (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	2747	100100	214	7253	180	7594	407	17168	97	3087	3645	135202
Kerala	1212	42201	366	11223	133	4629	254	7501	91	2433	2056	67987
Lakshadweep	18	330	0	0	5	122	0	0	0	0	23	452
Total	3977	142631	580	18476	318	12345	661	24669	188	5520	5724	203641

C = Courses; P = Participants

and other stakeholders during the year. State and participant category wise capacity development courses conducted are presented in Table 51. Data indicated that a total of 5724 training courses were conducted wherein trained 203641 participants. Out of which, 3645 courses were conducted with 135202 participants by KVKs of Karnataka, 2056 courses with 67987 participants by KVKs of Kerala and 23 courses with 452 participants by KVK, Lakshadweep. According to training type and participant category, 3977 capacity development courses were conducted for farmers (142631 participants), 580 capacity development courses for rural youth (18476 participants), 318 capacity development courses for extension personnel (12345 participants), 661 sponsored capacity development courses (24669 participants)

and 188 vocational capacity development courses (5520 participants).

3.1.3.1 Farmers and farmwomen

(a) State wise

A total of 3977 capacity development courses were conducted by KVKs of Zone XI and trained 142631 farmers and farm women. Out of which, KVKs of Karnataka conducted 2747 capacity development courses and trained 100100 farmers and farm women followed by KVKs of Kerala conducted 1212 capacity development courses and trained 42201 farmers and farm women and KVK, Lakshadweep conducted 18 capacity development courses and trained 330 farmers and farm women. Participants details are presented in Table 52.

Table 52: State wise capacity development courses conducted for farmers and farm women by KVKs of 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	2747	55321	21352	76673	14853	8574	23427	70174	29926	100100
Kerala	1212	21251	15749	37000	2662	2539	5201	23913	18288	42201
Lakshadweep	18	0	0	0	162	168	330	162	168	330
Total	3977	76572	37101	113673	17677	11281	28958	94249	48382	142631

(b) Area wise

Capacity development courses conducted for farmers/farm women on different areas by KVKs of Zone-XI are presented in Table 53. Crop production was the major area of capacity development with 937 courses and 35256 participants followed by

home science/women empowerment (544 courses) and plant protection(543 courses) and so on. Area wise capacity development courses conducted for farmers and farm women by KVKs of Karnataka, Kerala and Lakshadweep are presented in Tables 54, 55 and 56, respectively.

Table 53: Area wise capacity development courses conducted for farmers and farmwomen by KVKs of Zone-XI

Thematic 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	937	21232	7351	28583	4689	1984	6673	25921	9335	35256
Horticulture										
a) Vegetable crops	267	5076	2474	7550	1046	574	1620	6122	3048	9170
b) Fruit crops	139	3264	1078	4342	626	263	889	3890	1341	5231
c) Ornamental plants	24	427	180	607	122	36	158	549	216	765
d) Plantation crops	84	1519	694	2213	328	189	517	1847	883	2730
e) Tuber crops	18	409	269	678	74	33	107	483	302	785
f) Spices	44	1084	368	1452	191	38	229	1275	406	1681
g) Medicinal and aromatic plants	16	322	114	436	48	28	76	370	142	512
Soil health and fertility management	299	6044	1907	7951	1353	605	1958	7397	2512	9909
Livestock production and management	467	8985	3696	12681	2634	1721	4355	11619	5417	17036
Home science/ women empowerment	544	4201	9686	13887	1211	3072	4283	5412	12758	18170
Agriculture engineering	156	3199	1739	4938	810	578	1388	4009	2317	6326
Plant protection	543	11928	3198	15126	2698	851	3549	14626	4049	18675
Fisheries	69	1123	311	1434	272	95	367	1395	406	1801
Production of inputs at site	184	2686	2013	4699	629	668	1297	3315	2681	5996
Capacity building and group dynamics	117	3418	1581	4999	448	396	844	3866	1977	5843
Agro-forestry	69	1655	442	2097	498	150	648	2153	592	2745
Total	3977	76572	37101	113673	17677	11281	28958	94249	48382	142631

Table 54: Area wise capacity development courses conducted for farmers and farmwomen 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	713	16955	4431	21386	4124	1506	5630	21079	5937	27016
Horticulture										
a) Vegetable crops	169	3127	1098	4225	745	230	975	3872	1328	5200
b) Fruit crops	101	2359	365	2724	574	203	777	2933	568	3501
c) Ornamental plants	16	304	143	447	120	31	151	424	174	598
d) Plantation crops	49	1026	343	1369	272	110	382	1298	453	1751
e) Tuber crops	3	10	46	56	3	2	5	13	48	61
f) Spices	17	419	78	497	153	22	175	572	100	672
g) Medicinal and aromatic plants	6	147	31	178	26	11	37	173	42	215
Soil health and fertility management	241	4666	1271	5937	1116	490	1606	5782	1761	7543
Livestock production and management	313	6770	2207	8977	2088	1204	3292	8858	3411	12269
Home science/women empowerment	346	2183	6459	8642	871	2638	3509	3054	9097	12151
Agriculture Engineering	101	1938	1014	2952	730	522	1252	2668	1536	4204
Plant protection	407	9420	1804	11224	2404	609	3013	11824	2413	14237
Fisheries	52	1006	259	1265	240	84	324	1246	343	1589
Production of inputs at site	92	1355	741	2096	492	407	899	1847	1148	2995
Capacity building and group dynamics	65	2130	757	2887	393	343	736	2523	1100	3623
Agro-forestry	56	1506	305	1811	502	162	664	2008	467	2475
Total	2747	55321	21352	76673	14853	8574	23427	70174	29926	100100



Training on pepper nursery production (KVK, Uttar Kannada)



Training on budding in rambutan (KVK, Pathanamthitta)

Table 55: Area wise capacity development courses conducted for farmers and farmwomen by KVKs of Kerala

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	220	4277	2920	7197	528	403	931	4805	3323	8128
Horticulture										
a) Vegetable crops	97	1949	1376	3325	288	332	620	2237	1708	3945
b) Fruit crops	38	905	713	1618	52	60	112	957	773	1730
c) Ornamental plants	8	123	37	160	2	5	7	125	42	167
d) Plantation crops	33	493	351	844	56	34	90	549	385	934
e) Tuber crops	15	399	223	622	71	31	102	470	254	724
f) Spices	27	665	290	955	38	16	54	703	306	1009
g) Medicinal and aromatic plants	10	175	83	258	22	17	39	197	100	297
Soil Health and fertility management	58	1378	636	2014	237	115	352	1615	751	2366
Livestock production and management	147	2215	1489	3704	441	483	924	2656	1972	4628
Home Science/ women empowerment	198	2018	3227	5245	340	434	774	2358	3661	6019
Agriculture Engineering	55	1261	725	1986	80	56	136	1341	781	2122
Plant protection	135	2508	1394	3902	294	219	513	2802	1613	4415
Fisheries	13	117	52	169	16	11	27	133	63	196
Production of inputs at site	92	1331	1272	2603	137	261	398	1468	1533	3001
Capacity building and group dynamics	52	1288	824	2112	55	53	108	1343	877	2220
Agro-forestry	14	149	137	286	5	9	14	154	146	300
Total	1212	21251	15749	37000	2662	2539	5201	23913	18288	42201

Table 56: Area wise capacity development courses conducted for farmers and farmwomen 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	3	0	0	0	28	54	82	28	54	82
Horticulture										
a) Vegetable crops	1	0	0	0	13	12	25	13	12	25
d) Plantation crops	2	0	0	0	0	45	45	0	45	45
Livestock production and management	7	0	0	0	105	34	139	105	34	139
Plant protection	1	0	0	0	0	23	23	0	23	23
Fisheries	4	0	0	0	16	0	16	16	0	16
Total	18	0	0	0	162	168	330	162	168	330

3.1.3.2 Rural youth

(a) State wise

A total of 580 capacity development courses were conducted by KVKs of Zone XI and trained 18476 rural youth. Out of which, KVKs of Karnataka conducted 214 capacity development courses and trained 7253 rural youth and KVKs of Kerala conducted 366 capacity development courses and

trained 11223 rural youth. Participants details are presented in Table 57. Nearly 40.71 per cent of the rural youth trained were female, which is a proof of 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 (21.40%) but indicated further scope for mainstreaming the youth of socially disadvantaged sections.

Table 57: State wise capacity development courses conducted for rural youth by KVKs of 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	214	3967	1578	5545	1094	614	1708	5061	2192	7253
Kerala	366	4657	4320	8977	1237	1009	2246	5894	5329	11223
Total	580	8624	5898	14522	2331	1623	3954	10955	7521	18476

(b) Area wise:

A total of 580 capacity development courses were conducted by KVKs of Zone XI for rural youth

wherein trained 18476 participants in different areas. The major area of training was on value addition (86 courses, 2681 participants) followed

by mushroom production (43 courses, 1243 participants) and integrated farming (37 courses, 1415 participants) and so on (Table 58). The relative popularity of these areas reflects the preference of rural youth in areas representing secondary

agriculture. Area wise capacity development courses conducted for rural youth by KVKs of Karnataka and Kerala are presented in Tables 59 and 60, respectively.

Table 58: Area wise capacity development courses conducted for rural youth by KVKs of 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	32	674	449	1123	102	75	177	776	524	1300
Training and pruning of orchards	4	36	26	62	7	2	9	43	28	71
Protected cultivation of vegetable crops	24	199	226	425	78	45	123	277	271	548
Commercial fruit production	5	100	44	144	25	17	42	125	61	186
Integrated farming	37	867	300	1167	191	57	248	1058	357	1415
Seed production	4	65	27	92	10	4	14	75	31	106
Production of organic inputs	23	315	143	458	109	49	158	424	192	616
Planting material production	20	248	124	372	17	23	40	265	147	412
Vermi-culture	18	265	157	422	89	41	130	354	198	552
Mushroom production	43	449	486	935	146	162	308	595	648	1243
Bee-keeping	32	493	248	741	130	67	197	623	315	938
Sericulture	11	184	112	296	10	28	38	194	140	334
Repair and maintenance of farm machinery and implements	20	401	178	579	49	12	61	450	190	640
Value addition	86	1050	1167	2217	222	242	464	1272	1409	2681
Small scale processing	11	165	113	278	18	21	39	183	134	317
Post harvest technology	7	66	60	126	6	9	15	72	69	141
Tailoring and stitching	4	26	66	92	3	18	21	29	84	113
Rural Crafts	5	50	58	108	8	17	25	58	75	133
Production of quality animal products	1	41	12	53	0	0	0	41	12	53

Dairying	25	350	170	520	133	83	216	483	253	736
Sheep and goat rearing	24	461	65	526	186	53	239	647	118	765
Quail farming	2	30	31	61	18	28	46	48	59	107
Piggery	1	0	12	12	0	0	0	0	12	12
Poultry production	13	187	78	265	87	96	183	274	174	448
Ornamental fisheries	4	72	23	95	8	2	10	80	25	105
Composite fish culture	5	78	27	105	16	0	16	94	27	121
Freshwater prawn culture	2	19	0	19	1	5	6	20	5	25
Fish harvest and processing technology	1	2	25	27	0	0	0	2	25	27
Others	116	1731	1471	3202	662	467	1129	2393	1938	4331
Total	580	8624	5898	14522	2331	1623	3954	10955	7521	18476

Table 59: 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 in horticulture crops	12	240	63	303	41	40	81	281	103	384
Training and pruning of orchards	2	26	6	32	7	2	9	33	8	41
Protected cultivation of vegetable crops	4	79	5	84	36	5	41	115	10	125
Commercial fruit production	3	62	16	78	7	2	9	69	18	87
Integrated farming	20	621	104	725	119	22	141	740	126	866
Seed production	2	22	12	34	10	4	14	32	16	48
Production of organic inputs	7	145	22	167	37	13	50	182	35	217
Planting material production	4	106	10	116	9	5	14	115	15	130
Vermi-culture	10	183	52	235	59	27	86	242	79	321
Mushroom production	9	93	87	180	50	56	106	143	143	286
Bee-keeping	10	187	44	231	26	12	38	213	56	269
Sericulture	7	104	85	189	6	26	32	110	111	221
Repair and maintenance of farm machinery and implements	3	151	9	160	21	2	23	172	11	183
Value addition	13	123	190	313	42	65	107	165	255	420

Small scale processing	1	11	6	17	5	2	7	16	8	24
Post-Harvest Technology	1	26	4	30	3	0	3	29	4	33
Tailoring and stitching	4	26	66	92	3	18	21	29	84	113
Rural crafts	2	30	26	56	5	6	11	35	32	67
Production of quality animal products	1	41	12	53	0	0	0	41	12	53
Dairying	18	300	99	399	90	51	141	390	150	540
Sheep and goat rearing	20	431	44	475	143	19	162	574	63	637
Quail farming	1	11	6	17	5	2	7	16	8	24
Poultry production	6	134	18	152	55	9	64	189	27	216
Composite fish culture	4	63	14	77	16	0	16	79	14	93
Others	50	752	578	1330	299	226	525	1051	804	1855
Total	214	3967	1578	5545	1094	614	1708	5061	2192	7253



Table 60: 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	20	434	386	820	61	35	96	495	421	916
Training and pruning of orchards	2	10	20	30	0	0	0	10	20	30
Protected cultivation of vegetable crops	20	120	221	341	42	40	82	162	261	423
Commercial fruit production	2	38	28	66	18	15	33	56	43	99
Integrated farming	17	246	196	442	72	35	107	318	231	549
Seed production	2	43	15	58	0	0	0	43	15	58
Production of organic inputs	16	170	121	291	72	36	108	242	157	399
Planting material production	16	142	114	256	8	18	26	150	132	282

Vermi-culture	8	82	105	187	30	14	44	112	119	231
Mushroom production	34	356	399	755	96	106	202	452	505	957
Bee-keeping	22	306	204	510	104	55	159	410	259	669
Sericulture	4	80	27	107	4	2	6	84	29	113
Repair and maintenance of farm machinery and implements	17	250	169	419	28	10	38	278	179	457
Value addition	73	927	977	1904	180	177	357	1107	1154	2261
Small scale processing	10	154	107	261	13	19	32	167	126	293
Post-harvest technology	6	40	56	96	3	9	12	43	65	108
Rural crafts	3	20	32	52	3	11	14	23	43	66
Dairying	7	50	71	121	43	32	75	93	103	196
Sheep and goat rearing	4	30	21	51	43	34	77	73	55	128
Quail farming	1	19	25	44	13	26	39	32	51	83
Piggery	1	0	12	12	0	0	0	0	12	12
Poultry production	7	53	60	113	32	87	119	85	147	232
Ornamental fisheries	4	72	23	95	8	2	10	80	25	105
Composite fish culture	1	15	13	28	0	0	0	15	13	28
Freshwater prawn culture	2	19	0	19	1	5	6	20	5	25
Fish harvest and processing technology	1	2	25	27	0	0	0	2	25	27
Others	66	979	893	1872	363	241	604	1342	1134	2476
Total	366	4657	4320	8977	1237	1009	2246	5894	5329	11223

3.1.3.3 Extension personnel

(a) State wise

A total of 318 capacity development courses were conducted by KVKs of Zone XI and trained 12345 extension personnel. Out of which, KVKs of Karnataka conducted 180 capacity development courses and trained 7594 extension personnel, KVKs of Kerala conducted 133 capacity development courses and trained 4629 extension personnel and KVK, Lakshadweep conducted five capacity development courses and trained 122 extension personnel. Participants details are presented in Table 61.

(b) Area wise

Capacity development courses were conducted by KVKs of Zone-XI for extension personnel on different areas. Major area of capacity development was on Integrated Pest Management (38) followed by productivity enhancement in field crops (30) and so on (Table 62). Details on area wise capacity development courses conducted for extension personnel by KVKs of Karnataka, Kerala and Lakshadweep are presented in Tables 63, 64 and 65, respectively.

Table 61: Statewise capacity development courses conducted for extension personnel by KVKs of Zone-XI

State	Train ing courses (No.)	Extension personnel (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	180	3634	2390	6024	908	662	1570	4542	3052	7594
Kerala	133	1802	1853	3655	495	479	974	2297	2332	4629
Lakshadweep	5	0	0	0	56	66	122	56	66	122
Total	318	5436	4243	9679	1459	1207	2666	6895	5450	12345

Table 62: Area wise training courses conducted for extension personnel by KVKs of Zone-XI

Training area	Train ing 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	30	856	352	1208	261	146	407	1117	498	1615
Integrated Pest Management	38	562	443	1005	189	142	331	751	585	1336
Integrated Nutrient management	20	420	151	571	100	51	151	520	202	722
Rejuvenation of old orchards	4	68	61	129	3	0	3	71	61	132
Protected cultivation technology	15	210	264	474	61	21	82	271	285	556
Production and use of organic inputs	14	188	68	256	76	48	124	264	116	380
Care and maintenance of farm machinery and implements	4	84	29	113	1	0	1	85	29	114
Gender mainstreaming through SHGs	3	7	87	94	5	21	26	12	108	120
Formation and management of SHGs	3	32	50	82	23	24	47	55	74	129
Women and Child care	13	40	355	395	10	82	92	50	437	487
Low cost and nutrient efficient diet designing	3	26	26	52	2	1	3	28	27	55
Group Dynamics and farmers organization	20	328	198	526	40	69	109	368	267	635
Information networking among farmers	2	126	68	194	39	26	65	165	94	259
Capacity building for ICT application	12	316	84	400	65	20	85	381	104	485
Management in farm animals	6	179	50	229	28	12	40	207	62	269

Livestock feed and fodder production	17	405	69	474	107	17	124	512	86	598
Household food security	23	113	523	636	23	94	117	136	617	753
Others	91	1476	1365	2841	426	433	859	1902	1798	3700
Total	318	5436	4243	9679	1459	1207	2666	6895	5450	12345

Table 63: Area wise training courses conducted for extension personnel by KVKs of Karnataka

Training area	Train ing 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	18	635	191	826	163	42	205	798	233	1031
Integrated Pest Management	22	370	214	584	117	105	222	487	319	806
Integrated Nutrient management	12	316	68	384	68	23	91	384	91	475
Rejuvenation of old orchards	1	31	25	56	0	0	0	31	25	56
Protected cultivation technology	6	180	189	369	44	12	56	224	201	425
Production and use of organic inputs	7	161	29	190	70	39	109	231	68	299
Care and maintenance of farm machinery and implements	1	37	3	40	1	0	1	38	3	41
Gender mainstreaming through SHGs	3	7	87	94	5	21	26	12	108	120
Formation and Management of SHGs	2	27	48	75	21	23	44	48	71	119
Women and Child care	12	40	324	364	10	82	92	50	406	456
Low cost and nutrient efficient diet designing	1	2	22	24	0	0	0	2	22	24
Group dynamics and farmers organization	13	243	119	362	23	45	68	266	164	430
Capacity building for ICT application	8	241	39	280	60	19	79	301	58	359
Management in farm animals	6	179	50	229	28	12	40	207	62	269
Livestock feed and fodder production	13	368	48	416	99	11	110	467	59	526
Household food security	16	76	346	422	19	91	110	95	437	532
Others	39	721	588	1309	180	137	317	901	725	1626
Total	180	3634	2390	6024	908	662	1570	4542	3052	7594



Method demonstration on Bordeaux mixture preparation to extension functionaries (KVK, Chamarajanagara)



Capacity building programme to extension functionaries (KVK, Kalaburagi II)

Table 64: Area wise capacity development courses conducted for extension personnel by KVK of Kerala

Training 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	12	221	161	382	98	104	202	319	265	584
Integrated Pest Management	15	192	229	421	56	33	89	248	262	510
Integrated Nutrient Management	8	104	83	187	32	28	60	136	111	247
Rejuvenation of old orchards	3	37	36	73	3	0	3	40	36	76
Protected cultivation technology	9	30	75	105	17	9	26	47	84	131
Production and use of organic inputs	7	27	39	66	6	9	15	33	48	81
Care and maintenance of farm machinery and implements	3	47	26	73	0	0	0	47	26	73
Formation and management of SHGs	1	5	2	7	2	1	3	7	3	10
Women and child care	1	0	31	31	0	0	0	0	31	31
Low cost and nutrient efficient diet designing	2	24	4	28	2	1	3	26	5	31
Group Dynamics and farmers organization	7	85	79	164	17	24	41	102	103	205
Information networking among farmers	2	126	68	194	39	26	65	165	94	259
Capacity building for ICT application	4	75	45	120	5	1	6	80	46	126

Livestock feed and fodder production	4	37	21	58	8	6	14	45	27	72
Household food security	7	37	177	214	4	3	7	41	180	221
Others	48	755	777	1532	206	234	440	961	1011	1972
Total	133	1802	1853	3655	495	479	974	2297	2332	4629

Table 65: Area wise capacity development courses conducted for extension personnel by KVK Lakshadweep

Training Area	Capacity development courses (No.)	Participant extension personnel (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Integrated Pest Management	1			0	16	4	20	16	4	20
Other (Value addition and processing in coconut)	4			0	40	62	102	40	62	102
Total	5	0	0	0	56	66	122	56	66	122

3.1.3.4 Sponsored capacity development courses

A total of 661 sponsored capacity development courses were conducted by KVKs of Zone XI and trained 24669 participants. Out of which, KVKs of Karnataka conducted 407 sponsored capacity

development courses and trained 17168 participants and KVKs of Kerala conducted 254 sponsored capacity development courses and trained 7501 participants (Table 66). Area wise sponsored capacity development courses conducted by KVKs of Zone XI could be seen in Table 67.

Table 66: Statewise sponsored capacity development courses conducted by KVKs of Zone-XI

State	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	407	8656	4130	12786	2363	2019	4382	11019	6149	17168
Kerala	254	3368	2195	5563	1010	928	1938	4378	3123	7501
Total	661	12024	6325	18349	3373	2947	6320	15397	9272	24669

Table 67: Area wise sponsored capacity development courses conducted by KVKs of 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
Karnataka										
Crop production and management	59	1452	439	1891	287	118	405	1739	557	2296

Production and value addition	68	2076	276	2352	244	116	360	2320	392	2712
Post-harvest technology and value addition	23	424	233	657	156	287	443	580	520	1100
Farm machinery	34	1032	324	1356	341	144	485	1373	468	1841
Livestock and fisheries management	72	1688	643	2331	636	329	965	2324	972	3296
Home science	49	163	905	1068	120	609	729	283	1514	1797
Agricultural extension	102	1821	1310	3131	579	416	995	2400	1726	4126
Total	407	8656	4130	12786	2363	2019	4382	11019	6149	17168
Kerala										
Crop production and management	39	558	393	951	129	111	240	687	504	1191
Production and value addition	81	1333	776	2109	337	286	623	1670	1062	2732
Post-harvest technology and value addition	47	581	418	999	114	122	236	695	540	1235
Livestock and fisheries management	26	239	239	478	88	176	264	327	415	742
Home Science	14	42	107	149	70	125	195	112	232	344
Agricultural Extension	36	238	139	377	232	83	315	470	222	692
Total	243	2991	2072	5063	970	903	1873	3961	2975	6936
Zone total	650	11647	6202	17849	3333	2922	6255	14980	9124	24104



Capacity building on Integrated Pest Management in agricultural and horticultural crops for tribal farmers (KVK, Chamarajanagar)



Method demonstration on preservation in fruits and vegetables (KVK, Trivandrum)

3.1.3.5 Vocational Capacity development courses

A total of 185 vocational capacity development courses were conducted by KVKs of Zone XI and trained 5480 participants. Out of which, KVKs of Karnataka conducted 95 vocational capacity

development courses for 3053 participants and KVKs of Kerala conducted 90 vocational capacity development courses and trained 2427 participants (Table 68). Area wise vocational capacity development courses conducted by KVKs of Zone XI could be seen in Table 69.

Table 68: State wise vocational capacity development courses conducted by KVKs of Zone-XI

State	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Karnataka	95	1479	1010	2489	236	328	564	1715	1338	3053
Kerala	90	922	955	1877	231	319	550	1153	1274	2427
Total	185	2401	1965	4366	467	647	1114	2868	2612	5480

Table 69: Area wise vocational capacity development courses conducted by KVKs of 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
Karnataka										
Crop production and management	15	116	204	320	33	48	81	149	252	401
Post-harvest technology and value addition	5	16	76	92	2	48	50	18	124	142
Livestock and fisheries	39	778	410	1188	135	132	267	913	542	1455
Income generation activities	24	479	146	625	59	33	92	538	179	717
Agricultural Extension	12	90	174	264	7	67	74	97	241	338
Total	95	1479	1010	2489	236	328	564	1715	1338	3053
Kerala										
Crop production and management	15	231	213	444	69	73	142	300	286	586
Post-harvest technology and value addition	21	84	137	221	50	87	137	134	224	358
Livestock and fisheries	3	33	19	52	3	8	11	36	27	63
Income generation activities	47	513	583	1096	106	151	257	619	734	1353
Agricultural Extension	4	61	3	64	3	0	3	64	3	67
Total	90	922	955	1877	231	319	550	1153	1274	2427
Zone total	185	2401	1965	4366	467	647	1114	2868	2612	5480



Training on mushroom cultivation (KVK, Wayanad)



Goatary training (KVK, Kodagu)

3.1.3.6 On and off campus capacity development courses

(a) On campus

A total of 3410 on campus capacity development courses were conducted by KVKs of Zone XI for 122782 participants. Out of which, 1986 capacity development courses were conducted

for 73088 farmers and farm women, 153 capacity development courses for 4923 rural youth, 204 capacity development courses for 8085 extension personnel, 661 sponsored capacity development courses for 24669 participants and 188 vocational capacity development courses for 5520 budding entrepreneurs. State wise and participant wise data could be seen in Table 70.

Table 70: State wise on campus capacity development courses conducted by KVKs of Zone-XI

Capacity development category and state	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
(i) Farmers and farm women										
Karnataka	1354	27335	12550	39885	7365	5159	12524	34700	17709	52409
Kerala	614	9786	7895	17681	1391	1277	2668	11177	9172	20349
Lakshadweep	18	0	0	0	162	168	330	162	168	330
Total	1986	37121	20445	57566	8918	6604	15522	46039	27049	73088
(ii) Rural youth										
Karnataka	153	2493	1195	3688	777	458	1235	3270	1653	4923
Kerala	218	2832	2352	5184	788	525	1313	3620	2877	6497
Total	153	2493	1195	3688	777	458	1235	3270	1653	4923
(iii) Extension personnel										
Karnataka	131	2824	1680	4504	612	472	1084	3436	2152	5588
Kerala	68	832	919	1751	337	287	624	1169	1206	2375
Lakshadweep	5	0	0	0	56	66	122	56	66	122
Total	204	3656	2599	6255	1005	825	1830	4661	3424	8085
(iv) Sponsored training courses										
Karnataka	407	8656	4130	12786	2363	2019	4382	11019	6149	17168
Kerala	254	3368	2195	5563	1010	928	1938	4378	3123	7501
Total	661	12024	6325	18349	3373	2947	6320	15397	9272	24669
(v) Vocational training courses										
Karnataka	97	1502	1019	2521	238	328	566	1740	1347	3087
Kerala	91	928	955	1883	231	319	550	1159	1274	2433
Total	188	2430	1974	4404	469	647	1116	2899	2621	5520
Zone-XI										
Karnataka	2142	42810	20574	63384	11355	8436	19791	54165	29010	83175
Kerala	1245	17746	14316	32062	3757	3336	7093	21503	17652	39155
Lakshadweep	23	0	0	0	218	234	452	218	234	452
Zonal Total	3410	60556	34890	95446	15330	12006	27336	75886	46896	122782

(b) Off campus

A total of 2314 off campus capacity development courses were conducted and trained 80859 participants. Out of which, 1393 capacity development courses were conducted for

47691 farmers and farm women, 209 capacity development courses for 7056 rural youth and 114 capacity development courses for 4260 extension personnel. State wise and participant wise data could be seen in Table 71.

Table 71: State wise off campus capacity development courses conducted by KVKs of Zone-XI

Capacity development category and state	Capacity development courses (No.)	Participants (No.)								
		General			SC/ST			Grand total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
(i) Farmers and farm women										
Karnataka	1393	27986	8802	36788	7488	3415	10903	35474	12217	47691
Kerala	598	11465	7854	19319	1271	1262	2533	12736	9116	21852
Total	1393	27986	8802	36788	7488	3415	10903	35474	12217	47691
(ii) Rural youth										
Karnataka	61	1474	383	1857	317	156	473	1791	539	2330
Kerala	148	1825	1968	3793	449	484	933	2274	2452	4726
Total	209	3299	2351	5650	766	640	1406	4065	2991	7056
(iii) Extension personnel										
Karnataka	49	810	710	1520	296	190	486	1106	900	2006
Kerala	65	970	934	1904	158	192	350	1128	1126	2254
Total	114	1780	1644	3424	454	382	836	2234	2026	4260
Total off-campus capacity development courses for Zone-XI										
Karnataka	1503	30270	9895	40165	8101	3761	11862	38371	13656	52027
Kerala	811	14260	10756	25016	1878	1938	3816	16138	12694	28832
Total	2314	44530	20651	65181	9979	5699	15678	54509	26350	80859

3.1.4 Frontline Extension Programmes

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

(a) State wise

A total of 122026 extension programmes were carried out by KVKs of Zone XI through different methods by involving 1325862 farmers and 45768 extension personnel. Out of which, 72026, 49047, 953 extension programmes with the participation of 1039200, 285561, 1101 farmers and 38126, 7612, 30 extension personnel by KVKs of Karnataka,

Kerala, Lakshadweep, respectively (Table 72).

(b) Activity wise

KVKs of Karnataka provided more advisory services (30343) followed by farmers visits to KVKs (29138), scientist visits to farmers fields (4936) and so on (Table 73). Whereas KVKs of Kerala organized more farmers visit to KVKs (22777) followed by advisory services (21957) and Scientists visit to farmers fields (1890) and so on (Table 74). KVK, Lakshadweep carried out more advisory services (882) followed by diagnostic visits (42) and scientists visit to farmers fields (24) and so on (Table 75).

Table 72: State wise extension programmes carried out by KVKs

Name of the State	No. of Programmes	Farmers (No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Karnataka	72026	796213	129216	925429	82292	31479	113771	1039200	26972	11154	38126
Kerala	49047	166517	85307	251735	21807	12019	33826	285561	3727	3885	7612
Lakshadweep	953	0	0	0	694	407	1101	1101	22	8	30
Zone total	122026	962730	214523	1177164	104793	43905	148698	1325862	30721	15047	45768

Table 73: Extension programmes carried out by KVKs of Karnataka

Nature of Extension Programme	No. of Programmes	Farmers (No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Advisory services	30343	16964	5645	22609	3205	1297	4502	27111	2182	770	2952
Animal health camps	72	3370	551	3921	766	290	1056	4977	126	45	171
Celebration of important days	301	12063	4784	16847	3002	1867	4869	21716	888	449	1337
Diagnostic visits	1224	5318	878	6196	1200	275	1475	7671	696	209	905
Ex-trainees Sammelans	4	41	25	66	12	5	17	83	4	3	7
Exhibitions	129	97019	18908	115927	14375	4983	19358	135285	4158	1299	5457
Farmers Seminars	61	3126	1128	4254	620	283	903	5157	469	136	605
Farmers visit to KVKs	29139	22198	5151	27349	3893	1975	5868	33217	116	31	147
Field days	346	12715	2874	15589	2382	639	3021	18610	666	222	888
Film shows	384	10958	2955	13913	2737	1389	4126	18039	386	232	618
Group discussions/ meetings	658	10193	3218	13411	2069	879	2948	16359	890	475	1365
Kisangosthies	49	4390	754	5144	904	337	1241	6385	166	50	216
Kisanmelas	60	471511	47910	519421	26563	7593	34156	553577	6479	2946	9425
Lectures delivered as resource persons	2724	69365	17198	86563	10044	4068	14112	100675	6323	2769	9092
Mahilamandals conveners meetings	28	0	696	696	0	185	185	881	0	25	25
Method demonstrations	790	12797	3056	15853	2710	957	3667	19520	928	348	1276
Plant health camps	13	984	169	1153	196	129	325	1478	52	28	80
Scientist visit to farmers fields	4936	19569	3669	23238	2422	807	3229	26467	746	178	924

Self Help Group Conveners meetings	98	309	1900	2209	150	344	494	2703	67	72	139
Soil health camps	72	1110	270	1380	296	189	485	1865	135	62	197
Special day celebrations	262	11579	4748	16327	1848	1590	3438	19765	647	356	1003
Workshops	122	4432	1309	5741	977	634	1611	7352	395	231	626
Others	211	6202	1420	7622	1921	764	2685	10307	453	218	671
Total	72026	796213	129216	925429	82292	31479	113771	1039200	26972	11154	38126

Table 74: Extension programmes carried out by KVKs of Kerala

Nature of Extension Programme	No. of Programmes	Farmers (No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Advisory services	21957	10444	6190	16634	2288	1871	4159	20793	599	565	1164
Animal health camps	17	364	184	548	92	62	154	702	80	61	141
Celebration of important days	102	3715	2913	6628	301	315	616	7244	393	316	709
Diagnostic visits	369	921	484	1405	260	123	383	1788	176	168	344
Ex-trainees ammelans	14	320	200	431	34	33	67	498	48	66	114
Exhibitions	50	98182	41397	139579	11806	4019	15825	155404	380	417	797
Exposure visits	110	1067	1181	2248	320	294	614	2862	177	160	337
Farm Science Club meetings	6	151	80	231	39	18	57	288	2	0	2
Farmers seminars	91	2637	1354	3991	576	366	942	4933	219	142	361
Farmers visit to KVKs	22777	14437	6333	20770	1367	530	1897	22667	41	69	110
Field days	141	2102	1610	3712	523	474	997	4709	140	169	309
Film shows	73	1382	525	1907	422	186	608	2515	55	49	104
Group discussions/ meetings	316	3144	1876	5020	845	1046	1891	6911	225	243	468
Kisangosthies	17	338	354	692	61	98	159	851	56	71	127
Kisanmelas	18	5708	4193	9901	406	266	672	10573	194	241	435
Lectures delivered as resource persons	374	6132	4802	10934	694	731	1425	12359	420	592	1012
Mahilamandals meetings	3	0	39	39	0	31	31	70	0	0	0
Method demonstrations	313	4150	2331	6481	555	552	1107	7588	144	174	318

Plant health camps	6	107	44	151	25	44	69	220	7	12	19
Scientists visit to farmers fields	1890	3450	2005	5455	568	300	868	6323	0	0	0
Self-help group meetings	85	478	1831	2309	61	62	123	2432	65	53	118
Soil health camps	21	484	350	834	105	50	155	989	41	43	84
Special day celebrations	71	1961	1906	3867	282	320	602	4469	147	122	269
Workshops	46	2238	1434	3672	102	142	244	3916	78	102	180
Others	180	2605	1691	4296	75	86	161	4457	40	50	90
Total	49047	166517	85307	251735	21807	12019	33826	285561	3727	3885	7612

Table 75: Extension programmes carried out by KVK Lakshadweep

Nature of Extension Programme	No. of Programmes	Farmers (No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Advisory services	882	0	0	0	525	357	882	882	0	0	0
Diagnostic visits	42	0	0	0	50	22	72	72	16	8	24
Group meetings	3	0	0	0	45	0	45	45	4	0	0
Scientist visits to farmers fields	24	0	0	0	25	9	34	34	0	0	0
Workshop	1	0	0	0	45	15	60	60	6	0	6
Other (Science week)	1	0	0	0	4	4	8	8	0	0	0
Total	953	0	0	0	694	407	1101	1101	22	8	30

Data in Table 76 shows that KVKs of Zone XI carried out more advisory services (53182) followed by farmers visit to KVKs (51916), scientists visit to farmers fields (6850), lectures delivered as resource persons (3098), diagnostic visits (1635), method demonstrations (1103), group meetings (977), field days (487), film shows (457), celebration of important days (403), special

day celebrations (333), self-help group meetings (183), exhibitions (179), workshops (169), farmers seminars (152), exposure visits (110), soil health camps (93), kisanmelas (78), kisangosthies (66), mahilamandals conveners meetings (31), plant health camps (19), ex-trainees sammelans (18), farm science club meetings (6) and others (392).

Table 76: Extension programmes carried out by KVKs in Zone XI

Nature of Extension Programme	No. of Programmes	Farmers (No.)							Extension personnel (No.)		
		General			SC/ST			Grand total	Male	Female	Total
		Male	Female	Total	Male	Female	Total				
Advisory services	53182	27408	11835	39243	6018	3525	9543	48786	2781	1335	4116
Animal health camps	89	3734	735	4469	858	352	1210	5679	206	106	312
Celebration of important days	403	15778	7697	23475	3303	2182	5485	28960	1281	765	2046
Diagnostic visits	1635	6239	1362	7601	1510	420	1930	9531	888	385	1257
Ex-trainees Sammelans	18	361	225	497	46	38	84	581	52	69	121
Exhibitions	179	195201	60305	255506	26181	9002	35183	290689	4538	1716	6254
Exposure visits	110	1067	1181	2248	320	294	614	2862	177	160	337
Farm Science Club meetings	6	151	80	231	39	18	57	288	2	0	2
Farmers seminars	152	5763	2482	8245	1196	649	1845	10090	688	278	966
Farmers visit to KVKs	51916	36635	11484	48119	5260	2505	7765	55884	157	100	257
Field days	487	14817	4484	19301	2905	1113	4018	23319	806	391	1197
Film shows	457	12340	3480	15820	3159	1575	4734	20554	441	281	722
Group discussions/ meetings	977	13337	5094	18431	2959	1925	4884	23315	1119	718	1833
Kisangosthies	66	4728	1108	5836	965	435	1400	7236	222	121	343
Kisanmelas	78	477219	52103	529322	26969	7859	34828	564150	6673	3187	9860
Lectures delivered as resource persons	3098	75497	22000	97497	10738	4799	15537	113034	6743	3361	10104
Mahilamandals meetings	31	0	735	735	0	216	216	951	0	25	25
Method demonstrations	1103	16947	5387	22334	3265	1509	4774	27108	1072	522	1594
Plant health camps	19	1091	213	1304	221	173	394	1698	59	40	99
Scientists visit to farmers fields	6850	23019	5674	28693	3015	1116	4131	32824	746	178	924
Self-help group meetings	183	787	3731	4518	211	406	617	5135	132	125	257
Soil health camps	93	1594	620	2214	401	239	640	2854	176	105	281

Special day celebrations	333	13540	6654	20194	2130	1910	4040	24234	794	478	1272
Workshops	169	6670	2743	9413	1124	791	1915	11328	475	333	806
Others	392	8807	3111	11918	2000	854	2854	14772	493	268	761
Total	122026	962730	214523	1177164	104793	43905	148698	1325862	30721	15047	45746

(c) Mass contact

Data from Table 77 shows that the KVKs of Zone XI carried out 4528 extension programmes of mass contact. Out of which, KVKs of Karnataka carried out 3270 programmes, KVKs of Kerala carried out 1239 programmes and KVK Lakshadweep carried out 17 programmes. Among mass contact, large number of programmes were covered through 2578 news items published in local and national dailies.

Further, KVK scientists published 622 extension literature and 377 popular articles as well as prepared 189 DVD/CD/Video clippings during the year. KVKs were also participated in radio talks (472) and TV talks (255). It is worth to mention here that KVKs of Karnataka have participated in agricultural exhibitions and kisanmelas organized as mega events annually by their respective host organizations where in lakhs of farmers, extension personnel and other stakeholders took part.

Table 77: Extension programmes carried out for mass contact by KVKs in Zone-XI

Type of media/activity	Extension programmes for mass contact (No.)			
	Karnataka	Kerala	Lakshadweep	Total
Newspaper coverage	1763	815	0	2578
Extension literature	493	123	6	622
Radio talks	399	52	11	462
Popular articles	255	122	0	377
TV talks	148	54	0	202
CD/DVD/Video clips	135	54	0	189
Total	3270	1239	17	4526



Animal health camp (KVK, Alappuzha)



Exhibition (KVK, Bengaluru Rural)



Farmers day celebration (KVK, Belagavi-II)



Field day (KVK, Bidar)

3.1.5 Production of Technological Products

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. The details are given here under.

(a) Seeds

A total of 3520.18 q of seeds of different crops were produced by KVKs of Zone XI and supplied to 139278 farmers. Out of which, 3370.07 q seeds produced by KVKs of Karnataka and 150.11 q seeds produced by KVKs of Kerala (Table 78).

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

State	Quantity (q)	Worth (₹.)	Farmers (No.)
Karnataka	3370.07	18366457	104305
Kerala	150.11	4669022	34973
Total	3520.18	23035479	139278

Karnataka

KVKs of Karnataka produced more seeds of cereals (1748.15 q) followed by oilseeds (703.05 q), pulses (630.53 q), millets (172.13 q), fodder (61.56 q), vegetables (29.18 q), spices (20.13q) and green manure crops (5.37 q) and supplied to 104305 farmers (Table 79).

Table 79: Crop category wise production of seeds by KVKs of Karnataka

Crop category	Quantity (q)	Worth (₹.)	Farmers (No.)
Cereals	1748.15	4217075	15512
Oilseeds	703.05	6560640	43661
Pulses	630.53	4496875	17594
Millets	172.13	946715	18936
Fodder	61.56	923430	4245
Vegetables	29.18	1025592	3738
Spices	20.13	39850	170
Green Manure	5.34	156280	449
Total	3370.07	18366457	104305

Kerala

Kerala KVKs have produced more spices seeds (57.65 q) followed by cereals (49.90 q), pulses (14.10 q), tubers (17.06 q) and vegetables (14.40 q) and supplied to 34973 farmers (Table 80).

Table 80: Crop category wise production of seeds by KVKs of Kerala

Crop category	Quantity (q)	Worth (₹.)	Farmers (No.)
Spices	57.65	576500	848
Cereals	46.90	196980	410
Tubers	17.06	59710	193
Vegetables	14.40	3744182	33188
Pulses	14.10	91650	334
Total	150.11	4669022	34973

Crop category wise production of seeds by KVKs in the Zone presented in **Table 81** indicated that higher quantity of cereals seeds were produced (1795.05 q) followed by oilseeds (703.05 q), pulses (644.63 q), millets (172.13 q), spices (77.78 q), fodder (61.56 q), vegetables (43.58 q), tubers (17.06q) and green manures (5.34 q) and supplied to 139278 farmers

Table 81: Crop category wise production of seeds by KVKs in Zone-XI

Crop category	Quantity (q)	Worth (₹.)	Farmers (No.)
Cereals	1795.05	4414055	15922
Oilseeds	703.05	6560640	43661
Pulses	644.63	4588525	17928
Millets	172.13	946715	18936
Spices	77.78	616350	1018
Fodder	61.56	923430	4245
Vegetables	43.58	4769774	36926
Tubers	17.06	59710	193
Green Manure	5.34	156280	449
Total	3520.18	23035479	139278

(a) Planting materials

A total of 2724956 planting materials of different crops were produced by KVKs of Zone-XI and supplied to 122135 farmers. Out of which, 1533213 numbers of planting materials produced by KVKs of Karnataka and 1191743 numbers of planting materials produced by KVKs of Kerala (**Table 82**).

Table 82: State wise production of planting materials by KVKs in Zone XI

Crop category	Quantity (No.)	Worth (₹.)	Farmers (No.)
Karnataka	1533213	8870350	39807
Kerala	1191743	15428305	82328
Total	2724956	24298655	122135

Karnataka

KVKs of Karnataka produced highest number of planting materials of fodder (979186) followed by commercial (164409) plantation (129598), vegetables (115944), fruits (74903), spices (60575), flowers (3805), tree species (2630) and ornamental (2193) and provided to 39807 farmers (**Table 83**).

Table 83: Crop category wise production of planting materials by KVKs of Karnataka

Crop category	Quantity (No.)	Worth (₹.)	Farmers (No.)
Fodder	979186	1495162	7502
Commercial	164409	357316	277
Plantation	129598	2477523	7469
Vegetables	115944	658944	8943
Fruits	74903	2795384	7514
Spices	60545	964385	6675
Flowers	3805	30170	206
Tree species	2630	59665	735
Ornamental	2193	31801	486
Total	1533213	8870350	39807

Kerala

KVKs of Kerala produced more number of planting materials of vegetables (629362) followed by fodder (271900), spices (159432), plantation (60937), fruits (49535), tubers (9679), ornamental (6595), tree species (3338), medicinal and aromatic (952), and flowers (13) and supplied to 82328 farmers (**Table 84**).

Table 84: Crop category wise production of planting materials by KVKs of Kerala

Crop category	Quantity (No.)	Worth (₹.)	Farmers (No.)
Vegetables	629362	3146810	26528
Fodder	271900	543800	6277
Spices	159432	4047491	19727
Plantation	60937	4588610	14279
Fruits	49535	2594766	8944
Tubers	9679	222736	2656

Orna mental	6595	195187	1772
Tree species	3338	65610	1376
Medicinal and aromatic	952	23005	762
Flowers	13	290	7
Total	1191743	15428305	82328

Crop category wise production of planting materials produced by KVKs in Zone-XI presented in **Table 85** revealed that more quantity of planting materials were produced on fodder (1251086) followed by vegetables (745306), spices (219977), plantation (190535), commercial (164409), fruits (124438), tubers (9679), ornamental (8788), tree species (5938), flowers (3818), and medicinal and aromatic (952) and supplied to 86,935 farmers.

Table 85: Crop category wise production of planting materials by KVKs in Zone XI

Crop category	Quantity (No.)	Worth (₹.)	Farmers (No.)
Fodder	1251086	2038962	13779
Vegetables	745306	3805754	35471
Spices	219977	5011876	26402
Plantation	190535	7066133	21748
Commercial	164409	357316	277
Fruits	124438	5390150	16458
Tubers	9679	222736	2656
Ornamental	8788	226988	2258
Tree species	5968	125275	2111
Flowers	3818	30460	213
Medicinal and aromatic	952	23005	762
Total	2724956	24298655	122135

(b) Hybrids

State and crop category wise planting materials of crop hybrids produced by KVKs presented in **Table 86** shows that a total of 470217 numbers of hybrid planting materials of different crops were

produced by KVKs of Zone XI and supplied to 14937 farmers. Out of which, KVKs of Karnataka produced 285731 number of hybrid planting materials and provided to 12588 farmers, KVKs of Kerala produced 184486 number of vegetable hybrid planting materials and supplied to 2349 farmers.

Table 86: State and crop category wise production of planting materials of hybrid by KVKs in Zone XI

State	Crop category	Quantity (No.)	Worth (₹.)	Farmers (No.)
Karnataka	Vegetables	268614	671535	11572
	Fruits	17117	455255	1016
	Total	285731	1126790	12588
Kerala	Vegetable	184486	737944	2349
	Grand total	470217	1864734	14937

(c) Bio-products

A total of 8012.99 q of bio-products were produced by KVKs of Zone XI and supplied to 184783 farmers. Out of which, 2538.09 q of bio-products produced by KVKs of Karnataka and 5474.90 q of bio-products produced by KVKs of Kerala (**Table 87**).

Table 87: State wise production of bio-products by KVKs in Zone XI

State	Quantity (q)	Worth (₹.)	Farmers (No.)
Karnataka	2538.09	16486126	52910
Kerala	5474.90	40523739	131873
Total	8012.99	57009865	184783

Karnataka

KVKs of Karnataka produced 2538.09 quintals of bio product which included bio-fertilisers (1696.64 q), micro nutrient mixtures (541.78 q), bio-fungicides 104.96 q), bio-pesticides (97.33 q), organic manures (92.92 q), bio-agents (4.33 q) and mushroom spawn (0.13 q) and provided to 52910 farmers (**Table 88**).

Table 88: Category wise production of bioproducts by KVKs of Karnataka

Crop category	Quantity (q)	Worth (₹.)	Farmers (No.)
Bio-fertilizers	1696.64	3102497	11005
Micro nutrient mixtures	541.78	10227287	15072
Bio-fungicides	104.96	1092852	9165
Bio-pesticides	97.33	1214695	8559
Organic manures	92.92	557509	8098
Bio-agents	4.33	189364	943.00
Mushroom Spawn	0.13	101922	68
Total	2538.09	16486126	52910

Kerala

KVKs of Kerala produced 5474.90 quintal of bio products which included bio-fertilizers (1871.46 q), micro nutrient mixtures (1778.54 q), bio - pesticides (918.31 q), organic manures (580.54 q) bio-fungicides (322.98 q), mushroom spawn (1.93 q) and bio-agents (1.14 q) and supplied to 131873 farmers (Table 89).

Table 89: Category wise production of bio-products by KVKs of Kerala

Crop category	Quantity (q)	Worth (₹.)	Farmers (No.)
Bio-fertilizers	1871.46	8837359	42088
Micro nutrient mixtures	1778.54	17785400	22083
Bio-pesticides	918.31	5939493	15824
Organic manures	580.54	2089944	15788
Bio-fungicides	322.98	4844671	30220
Mushroom spawn	1.93	964805	5733
Bio-agents	1.14	62067	137
Total	5474.90	40523739	131873

Category wise bio-products produced by KVKs in the Zone presented in Table 90 revealed that more quantity of bio-fertilisers (3568.10 q) were produced followed by micro nutrient mixtures (2320.32 q), bio-pesticides (1015.64 q), organic manures (673.46 q), bio-fungicides (427.94 q), bio-agents (5.47 q) and mushroom spawn (2.06 q) and supplied to 184783 farmers. Further KVKs in the Zone XI produced 31335 number of Pheromone traps of which KVKs of Karnataka produced 21324 Pheromone traps and KVKs of Kerala produced 10011 Pheromone traps and supplied to 5544 farmers.

Table 90: Category wise production of bio-products by KVKs in Zone XI

Crop category	Quantity (q)	Worth (₹.)	Farmers (No.)
Bio-fertilizers	3568.10	11939856	53093
Micro nutrient mixtures	2320.32	28012687	37155
Bio-pesticides	1015.64	7154188	24383
Organic manures	673.46	2647453	23886
Bio-fungicides	427.94	5937523	39385
Bio-agents	5.47	251431	1080
Mushroom spawn	2.06	1066727	5801
Total	8012.99	57009865	184783

(c) Livestock and fisheries

A total of 396206 numbers of livestock and fish fingerlings were produced by KVKs of Zone XI and supplied to 29500 farmers. Out of which, 120877 livestock and fish fingerlings produced by KVKs of Karnataka and 275329 livestock and fish fingerlings produced by KVKs of Kerala (Table 91).

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

State	Quantity (q)	Worth (₹.)	Farmers (No.)
Karnataka	120877	2645806	12104
Kerala	275329	2309404	17396
Total	396206	4955210	29500

Karnataka

KVKs of Karnataka produced more number of fish fingerlings (91000) followed by poultry chicks (20970), poultry eggs (8009), piglets (451), sheep and goat kids (404) and dairy calves (28), rabbit bunnies (15) and provided to 12104 farmers (Table 92).

Table 92: Category wise production of livestock and fish fingerlings by KVKs of Karnataka

Particulars of Livestock	Quantity (No.)	Worth (₹.)	Farmers (No.)
Fish fingerlings	91000	455000	900
Poultry chicks	20970	608932	7991
Poultry eggs	8009	48054	2812
Piglets	451	489420	280
Sheep and goat kids	404	798350	101
Dairy calves	28	243000	16
Rabbit bunnies	15	3050	4
Total	120877	2645806	12104

Kerala

KVKs of Kerala produced more number of fish fingerlings (226692) followed by poultry chicks (46892), poultry eggs (1725) and sheep & goat kids (151), rabbit bunnies (15) and dairy calves (5) and supplied to 17396 farmers (Table 93).

Table 93: Category wise production of livestock and fish fingerlings by KVKs of Kerala

Particulars of Livestock	Quantity (No.)	Worth (₹.)	Farmers (No.)
Fish fingerlings	226692	653384	434
Poultry chicks	46892	1406170	16783
Poultry eggs	1725	13800	104
Sheep and goat kids	151	120800	67
Rabbit bunnies	15	2250	3
Dairy calves	5	113000	5
Total	275329	2309404	17396

Category wise production of livestock and fish fingerlings by KVKs in the Zone presented in Table 94 revealed that more numbers of fish fingerlings (317692) were produced followed by poultry chicks (67862), poultry eggs (9737), sheep and goat kids (555), piglets (451), dairy calves (33) and rabbitary (30) and provided to 20,050 farmers.

Table 94: Category wise production of livestock and fish fingerlings by KVKs in Zone XI

Particulars of Livestock	Quantity (No.)	Worth (₹.)	Farmers (No.)
Fish fingerlings	317692	1108384	1334
Poultry chicks	67862	2015102	24774
Poultry eggs	9734	61854	2916
Sheep and goat kids	555	919150	168
Piglets	451	489420	280
Dairy calves	33	356000	21
Rabbit bunnies	30	5300	7
Total	396206	4955210	29500



Coconut nursery (KVK, Chamarajanagar)



Dragon fruit saplings (KVK, Vijayapura-II)

3.1.6 Kisan Mobile Advisory Service (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. Details presented in **Table 95** shows that 31 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, 15294 text messages were sent to 3.96 lakh farmers. Among these most messaging was related to awareness (5091) followed by crops (4720), livestock (2059), other enterprises (1679) and marketing (880).

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

A total of 45 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. Data in **Table 96** indicated that a total of 36512 samples of soil, water, plant, manure and others received from 30526 farmers belonging to 14730 villages were analyzed. State wise data presented in **Table 97** showed that KVKs

of Karnataka analyzed 33127 samples whereas 3371 and 14 samples were analyzed by Kerala and Lakshadweep, respectively.

Table 96: Samples analyzed by KVKs of Zone-XI

Type of sample	Samples (No.)	Farmers (No.)	Villages (No.)
Soil	27336	22,615	9,891
Water	8398	7,264	4,686
Plant	579	492	35
Manure and others	199	155	118
Total	36512	27759	14838

Table 97: State wise soil, water, plant analysis carried out by KVKs of Zone-XI

State	Samples (No.)	Farmers (No.)	Villages (No.)
Karnataka	33127	27573	14545
Kerala	3371	2939	181
Lakshadweep	14	14	4
Total	36512	27759	14838

In addition to 45 SWTL, 7 KVKs have used mobile soil testing kits to meet the growing need of soil testing by farmers and tested 1535 soil samples belonging to 1099 farmers spread across 76 villages (Table 98). 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 99 and it shows that a total of 5847 soil health cards were distributed among farmers by KVKs of Zone XI. Out of which 4317 soil health cards are through

Table 95: State wise SMS text on priority areas sent to farmers by KVKs of Zone-XI

State	KVKs (No.)	Farmers (No.)	Advisories (No.)						Total
			Crop	Livestock	Weather	Marketing	Awareness	Other enterprises	
Karnataka	20	354138	1779	663	370	224	433	390	3859
Kerala	10	42226	2941	1059	399	656	4603	1289	10947
Lakshadweep	1	78	0	337	96	0	55	0	488
Total	31	396442	4720	2059	865	880	5091	1679	15294

SWTL and 1530 soil health cards are through mobile soil testing kits.

Table 98: State wise soil testing by KVKs of Zone-XI using mobile soil testing kits

State	Samples (No.)	Farmers (No.)	Villages (No.)
Karnataka	606	604	27
Kerala	929	495	49
Total	1535	2161	475

Table 99: State wise distribution of soil health cards by KVKs of Zone-XI

State	Distribution of soil health cards (No.)		
	SWTL	Mobile soil testing kit	Total
Karnataka	2214	605	2819
Kerala	2103	925	3028
Total	4317	1530	5847

3.1.7.1 Celebration of world soil day -2022

It was celebrated on 5th December, 2022 by KVKs of Zone XI on the Theme “Soils: Where food begins”. The programme included various events such as awareness campaigns, lecture by experts, group discussion, debating and drawing competitions among the farmers, KVKs staff and school children besides distributing inputs and soil health cards to farmers. All forty seven KVKs of ATARI, Bengaluru organized the programme wherein 3373 farmers, 300 scientists, and 1292 students participated. On the occasion, 122 VIPs and public representatives also participated and graced the event.



Shri Basavangouda Patil Yatnal MLA participated in soil awareness campaign (Vijayapura-II)



Soil health cards distribution (KVK, Kalaburgi-II)

3.1.8 Rainwater Harvesting Units

Rainwater harvesting units with micro irrigation system established in 12 KVKs during the previous years were utilized by the respective KVKs for educating farming community. During the period, KVKs conducted 37 training courses and 40 demonstrations as well as produced 200476 planting material utilizing the facility. Further, 8263 farmers and 166 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 Farm Science Centres at the district level. Details on collaborative activities of KVKs with other agencies are given below:

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

KVKs participated in 956 programmes organized by ATMA and at the same time KVKs organized 553 programmes in collaboration with ATMA. State and programmes wise details are presented in Table 100.

(b) External funded projects/schemes

A total of Rs. 585.17 lakh was received by KVKs of Zone-XI of which Rs. 278.50 lakh by KVKs of Karnataka and Rs. 306.67 lakh by KVKs of Kerala (Table 101) through external funding of projects. In terms of total amount received, support from the state governments and development departments

Table 100: Details of linkages with ATMA by KVKs of 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	137	38	82	25	219	63
Research projects	24	14	6	4	30	18
Training programmes	274	43	78	57	352	100
Demonstrations	108	202	52	57	160	259
KisanMela	16	8	23	11	39	19
Technology Week	9	6	1	1	10	7
Exposure visit	20	6	22	27	42	33
Exhibition	38	8	11	13	49	21
Soil health camps	41	18	2	1	43	19
Animal health campaigns	6	0	1	1	7	1
Video films	2	2	0	0	2	2
Books	0	1	0	0	0	1
Extension literature	3	0	0	10	3	10
Total	678	346	278	207	956	553

was more in both Karnataka and Kerala. Agencies like Karnataka Renewable Energy Development Limited, Bengaluru; MANAGE, Hyderabad; Sanjeevini-Karnataka State Rural Livelihood Promotion Society, Bengaluru; Rashtriya Krishi Vikas Yojana (RKVY); National Horticultural

Mission and National Bank for Agriculture and Rural Development (NABARD) funded/supported KVK activities. Various Boards and Directorates also supported KVK activities through convergence and linkages for optimum utilization of available resources.

Table 101: External fund received by KVKs of Zone-XI through convergence and linkages

Name of external funding agency	KVKs (No.)	Amount received (₹.)
Karnataka		
Seedling India Pvt.Ltd. New Delhi	1	550600
BASF India Ltd., Awfis Solutions Pvt. Ltd., Bengaluru	1	654000
Coconut Development Board, Bengaluru	3	682000
Coromandel International Limited., Secunderabad, Telangana	1	1190000
Department of Biotechnology, GoI	1	3100000
Directorate of Plant Protection Quarantine and storage, Faridabad	1	49700

Heranba Industries Limited, Mumbai	1	128800
ICAR Institutes	2	531500
Institute of Wood Science & Technology, Bangalore	1	25000
Karnataka Renewable Energy Development Limited, Bengaluru	5	395000
MANAGE, Hyderabad	5	4302000
Mission for integrated development of Horticulture	1	1625000
Nandu Seeds, Chitradurga	1	10000
National Fishery Development Board, Hyderabad	1	400000
National Horticultural Mission	1	105000
National mission for sustainable agriculture	1	4000000
NMHO-II BASF India Ltd. Mumbai	1	385000
Prism Crop Science Pvt. Ltd., Hyderabad	1	126000
RKVY	2	6250000
Sanjeevini-Karnataka State Rural Livelihood Promotion Society, Bengaluru	4	2584440
Seedlings India Pvt Ltd. New Delhi	1	119000
State Agricultural Universities	2	250000
Taralabalu District Bio-energy Research Information & Demonstration Centre	1	285000
ZP, Chitradurga	1	102000
Total		27850040
Kerala		
Dept. of Food Processing, Govt. of Meghalaya	1	3385250
Kerala biodiversity board	1	250000
Coconut Development Board	1	226000
DoA, GoK	3	15382973
DoECC, GoK	2	2580000
GoK	2	67400
ICAR Institutes	2	400000
IOB RSETI	1	45000
MANAGE, Hyderabad	3	1129100
NABARD	3	1023250
National Horticultural Mission	1	110000
State Agricultural Universities	1	2143900
State Horticulture Mission	1	2500000
State Planning Board	1	1424045
Total		30666918
Grand Total		58516958

3.1.10 Success stories and cases of large-scale adoptions

(1) Rabi jowar variety-SPV-2217 (KVK Belagavi-II)

Rabi jowar is one of the major cereal crop next to Maize in Belagavi district. It is grown in an area of 143616 ha with production of 157244 tonne and productivity of 1153kg/ha. Major area comes in rabi season under rainfed situation cultivating old varieties like M-35-1 and Murkhibhavi which are characterised by less yield, susceptible to lodging and prone to charcoal rot. To address the issue, KVK, Belagavi-II has demonstrated rabi jowar variety-SPV-2217 in 22.00 ha by involving 55 farmers belonging to Mardinagalapur and Hanabaratti, Tigadi, Bevinakoppa villages of Bailhongal taluk and Ingalagi of Savadatti Taluk during 2017-18 to 2021-22. Along with the variety, technologies like seed treatment with *Azospirillum* 200 gm per acre seed, seed priming with calcium chloride 90g in 4.5 l of water, application of micronutrient ZnSO₄ @ 15 kg/ha, weed management through herbicide Atrazine 50WP @ 1000g/ha, spraying of Imidacloprid 17.8 SL and installing pheromone



Field performance of
rabi jowar variety-SPV-2217

traps. It was observed that more plant height (170.90 cm), no lodging with variety-SPV-2217 as compared to check variety M-35-1 (170.90 cm height and 21.50% lodging). Further, rabi jowar variety-SPV-2217 gave higher grain (17.10 q/ha) and fodder(31.30 q/ha) yield as compared to check variety M-35-1 (14.90 q/h grain and 27.30 q/ha fodder yield) with net returns of Rs.39769/ha and Rs.29455/ha and 2.70 BCR and 2.30 BCR, respectively. By sharing the seeds among farmers, this variety (SPV-2217) spread in 400 ha across the district.

(b) Probiotics for optimum post-weaning growth in lambs (KVK Bengaluru Rural)

Sheep rearing is one the major subsidiary in Bangalore Rural District with close to 1.20 lakh sheeps in the district. However, the major problem is the diarrhea and reduced growth of lambs due to imbalance in rumen microflora leading to mortality especially in the post-weaning period of the lambs. To address the issue, KVK, Bengaluru Rural has conducted training on probiotics for optimum post-weaning growth in lambs followed by demonstration in farmers fields. The probiotic used was “Biobloom Forte” which contains beneficial microbes such as *Saccharomyces cerevisiae* and *Lactobaccillus sporogenes*. In addition, it also contains protein grown on soyabean and maize gluten meal fortified with calcium, phosphorous, carbohydrates, vitamins, unidentified growth factors and enzymes including phytase, cellulase, xylanase and pectinase. About 5g/day/animal of Biobloom Forte mixed with the feed was given to the post weaning lambs from the age of ~2 months for 4 months. Farmers were asked to maintain another set of lambs without giving Biobloom Forte as check. Training was given on how much probiotic and how to mix with the feed. The demonstration was conducted under close supervision of scientists. The probiotic fed lambs showed increased body weight of 14.88 kg/animal compared to the check animals which showed 12.11 kg/animal. There was a 22.87 Per cent increase in the body weight of the lambs. Further there was only 2 Per cent mortality in probiotic supplemented sheeps whereas check sheeps

showed 26.67 Per cent mortality. In fact, in some of the demo's there was no mortality observed. This has resulted in increased income from the demo animals which is 31.44 Per cent more than the check animals. The farmers were very much satisfied with the technology and suggesting other farmers to adopt the same for better animal health and income. This technology was also promoted in several animal health camps. With this technology, farmer could expand lamb farms to meet the ever-increasing demand for lamb and also to generate additional income and employment.



Support of Probiotics as critical input

(c) Ginger Candy - a little but something for everyone (KVK, Bidar)

Ginger occupies an area of 4000 ha in Bidar district, being a potential crop is largely cultivated and traded in raw form. Keeping in view the low shelf-life of fresh ginger and inadequate facility for modern storage, value addition could be a viable alternative. A woman self Help Group consisting 14 members named 'Annapurneshwari' has established home scale ginger value addition unit at Humnabad in Bidar district with the technical support from KVK, Bidar. All the members

were trained on technologies for ginger value added products like ginger bars/rolls, appetizer flakes, essential oils & aroma, juice, paste and starch along with ginger candy, salted ginger and crystallized ginger. Women SHG started making the ginger candies as well as ginger leathers and are very excited to take up in large scale because of excellent response from the local consumers. Candy is an instant hit with people across different age groups. To the women, success is to have your voice heard, and to be creative and to be part of the conversation, they expressed.



A view of ginger candy

(d) Smt. Sakamma – A Millet Entrepreneur (KVK, Mandya)

Smt. Sakamma w/o Doddalingaiah is a farm woman from Holalu village of Mandya district, Karnataka. Her family engaged in cultivating crops like paddy, sugarcane and millets. The income from farming was not sufficient to meet the needs of the family. She had a loan in connecting with her children's education. It was difficult to repay the loan with the existing farming. She came in contact with KVK, Mandya and attended the training programme on "Processing and value addition to agriculture produce" for 6 days in the year 2018-19. Having trained at KVK, she started making papads from various millets and pulses and sold in melas and shandies during 2019-20. She started her business under the brand Chittalamma after getting FSSAI licence from Department of Health and Family Welfare and offered a range of products like papads, malt, khara sev from foxtail millet and finger millet, laddu, chakkuli, kodubale and nippattu from little millet and foxtail millet.

Smt. Sakamma earns a monthly income of Rs. 45000. Further, she gave opportunity to four women as working partners in her business. Value added products of millets had a demand in the local market and hence she prepares value added products from millets in a large scale by using organically produced millets. Smt. Sakamma started the business informally but her products were appreciated and received a better value in the local market, which leads to recognition by the agriculture and allied department officials who approached her to promote organic millet products. She says, she has an aim to promote organic foods.



A view of different millet products

(e) Drip laterals rolling device by Amaresh Sharanappa Kote (KVK, Raichur)

Drip system was popular and area under system has been increasing because of its usefulness under less irrigation water, farmers are eager in adopting drip making heavy investment. But after installation within three to four years the drip system may become useless in most of the farmers field because of improper handling of the drip laterals particularly rolling of drip laterals is a very difficult task and also improper rolling adversely affect

the life span of the laterals. If we employ labour for rolling of drip laterals it is time consuming and laborious. In this situation, Shri Amaresh Sharanappa Kote belonging to Jakkalddinni village in Manvi taluk of Raichur district has innovated drip laterals rolling machine which is portable and can be drag across the field and roll the drip laterals very neatly without any bends. He employed the technique of umbrella folding and opening for this drip laterals rolling device. Because of that after rolling of laterals it gives a bundle of drip laterals. With this implement, easily roll the drip laterals without drudgery in handling and also saving time and labour cost. Seven men labourers will be engaged for rolling drip laterals in one ha per day and it costs around Rs.2500. Whereas, this can be done with two labour with drip laterals rolling device with one-time investment on device cost of Rs.5000. Beside this, it also protects laterals from bending or damage while rolling and helps in enhanced life span of laterals. As maintenance of the lifespan of laterals is most important in drip irrigation, drip laterals rolling device is one of the important gadgets at this moment.



Drip laterals rolling device on action

(f) BRG-3 – redgram variety resistant to wilt and sterility mosaic (KVK, Ramanagara)

Red gram (*Cajanuscajan*) is an important pulse crop in Karnataka and its productivity is severely affected by biotic stresses such as *Fusarium* wilt (FW) caused by *Fusarium udum* and Sterility Mosaic Disease (SMD) transmitted by mite, *Aceriaacajani*. The disease spread at any stage of the plant, but the highest mortality occurs at the flowering and podding stage which could result in complete yield loss. Hence, the farmers in the region rely exclusively on the application of chemical fungicides to combat *Fusarium* wilt and SMD which has resulted in a tremendous misuse of fungicides and insecticides in an attempt to recover the infections. Hence, many farmers refrained from growing red gram because of these constraints.

Under this situation, KVK, Ramanagara demonstrated BRG-3 variety, released as resistant to wilt and sterility mosaic, in 50 farmers' fields in the district. Along with variety, KVK demonstrated various agronomic practices *viz.*, seed treatment with *rhizobium* @ 20 gm/ kg, application of pulse magic (Micro nutrient mixture), *Helicoverpa* sex pheromone traps @ 5 Nos./acre, microbial pesticide application, and hermetic bags (Multi-layer polythene bag). The variety BRG-3 showed tolerance to wilt and sterility disease, produced more number of pods and gave better yield (11.18 q/ha) which resulted in 40.23% increased yield and higher net returns (Rs.36234) as compared to the farmers practice. Further, crop was absolutely free from *Fusarium wilt* and sterility mosaic disease compared to local varieties. Five FLD



Field performance of BRG-3 – redgram variety resistant to wilt and sterility mosaic

farmers produce was linked to seed production and fetched an extra 40 per cent of income through seed production. The feedback from farmers was satisfactory and highly preferred for vegetable purpose. Hence, Department of Agriculture, GOK got seed indent from 100 farmers for the year 2023-24.

(g) FPO- Udupi Kalparasa Coconut and All Spice Producer's Company (UKCAAS) (KVK, Udupi)

A Farmer's Producer Company named as Udupi Kalparasa Coconut and all Spices Producer Company (UKCAAS) was started in March 2019, with the initiation of 10 Directors, 1028 farmer members as shareholders, spread out in 54 villages under 3 talukas of Udupi district. In March 2020, the company obtained "In Principle" license from the Karnataka State Excise Department, with the recommendation of Horticulture Department to train tappers and run the kalparasa/neera trial unit. The company improved tapping efficiency with the assistance of traditional toddy tappers of the local area. The tapping of kalparasa has been initiated in Kundapura taluk, Japthi and Hossadu villages under the technical guidance of Scientist (Horticulture) of KVK, Udupi. A total of 21 kalparasa tapping technicians were trained, wherein 100 liters of kalparasa are tapped per day. The company has planned to tap eight healthy coconut trees of every farmer member. The company can collect around 4,000 to 5,000 liters of kalparasa from each farmer annually. On an average, an individual farmer can earn Rs. 80,000 to 1,00,000 annually. The company

plans to work similar with the Milk Co-Operative Societies model in another five years. Each farmer can tap their coconut trees with proper training and technology and collected kalparasa will be supplied to village level coconut producer's society. From the 54-village level coconut producer societies, the company has 5,628 member farmers, and the company is in the process of selecting the coconut palms for kalparasa tapping. The crop loss due to monkeys is one of the major problems addressed by the coconut farmers of the district. Tapping the coconut inflorescence for kalparasa production as per the technology developed by ICAR-CPCRI, Kasaragod can solve the problem of monkey menace. After certain trial and error, the company could improve the per tree production capacity, jaggery and sugar quality and marketing kalparasa and its value-added products from December 2021. The company has two marketing outlets at Japthi village, and another at Kundapura town.

The kalparasa technician trained by KVK, Udupi to tap 16 coconut palms per day, by which he earns more than Rs. 20,000 per month, by working 4 to 5 hours daily. In five years, the company requires around 2,500 kalparasa technicians and another 300 supporting employees for the smooth functioning of the company for the production and marketing of kalparasa and other value-added coconut products. More secured "Green collar employment" at the village level will help reduce the migration of youngsters to urban areas. One village one product is another important objective of the company. Along with tapping kalparasa, the company plans to produce one value-added product of coconut in



Taping



Trained tappers



Kalparasa and its products

each village. So that the coconuts produced by the remaining palms (other than eight palms marked for kalparasa tapping) are also properly processed to value-added products, which helps the farmer to get a better income.

(h) Sheep farming: A Boon to the Farmer (KVK, Chikkaballapura)

Shri. Sampath Kumar K.N (45) is hailing from Kudumalakunte village of Gouribidanur taluk, Chikkaballapura district. He owns 15 acres of land growing diversified crops like maize, finger millet, redgram, field bean and possess farming experience of 25 years. He was not satisfied with the returns getting from growing the crops and started thinking of trying some innovative methods in farming instead of growing regular crops. That's when he got the idea of starting a sheep farming which could function with low rearing cost and high returns. He sought the advice of KVK scientists and visited successful sheep farming units which provided the basic idea how to proceed further and start sheep farming.

He constructed low cost sheep rearing shed in 60 x 30 square feet area using the available resources by adopting the stall method for feed management with optimum ventilation. He laid stone slabs on the ground for easy cleaning and management. Mr. Sampath Kumar is growing the natural feed on 4 acres of land. These 4 acres of land is just beside the sheep shed to overcome the transportation and handling costs. Scientific usage of these natural feed sources is helping him to provide feed for sheep at proper time which results in better growth and development of sheep. He is growing super napier, CO-3, COFS-29, fodder maize, ragi straw and also perennial fodder trees like *Melia dubia* and drumstick for feed management. Mr. Sampath Kumar adopted mechanization and uses chaff cutter purchased at subsidized rate from agriculture department to cut the grass into small pieces. This has reduced the labour cost and also feed wastage. Mr. Sampath Kumar adopted semi-intensive rearing system where in sheeps are reared outside and in sheds simultaneously. He releases his sheeps into farms and outside environment daily morning after 10 AM. He opined that the growth and development of sheep is dependent on the time they spend outside the shed and this helps in creating stress free conditions for the sheep which add quick muscle growth and aids in better health. While the sheep are released outside, the workers clean the shed and also take care of other activities like cleaning, filling water in containers and cutting the fodder into small pieces. Sheep again return to shed at 4 PM and then feed is given to them. Further, sheeps are vaccinated at regular intervals to overcome the problem of disease incidence.

In order to avoid high risk, Mr. Sampathkumar opted for rearing and selling the sheep instead of breeding as it involves more time and risk. He visits the Sindhanur sheep market and select and purchase 65- 70 three months healthy sheeps at average cost of Rs.6500 to 7000 per sheep. He rears the sheep for about 2.5 to 3 months and sell them. He opined that he has good network of buyers hence, he don't take the sheeps for markets to sell instead buyers themselves come to his farm to purchase the sheep. He sells the sheep at an

average cost of Rs. 10,500- 11,000. But during special occasions like bakrid, christmas, dasara he sells the sheep on live weight basis like Rs. 320 per kg live weight. He expresses that he incurs Rs 1000 per sheep for transportation, rearing, vaccination and other expenses. He rears 4 batches of sheep in a year leading to 260- 280 sheeps per year. He further opined that he can save minimum of Rs. 2500 per sheep leading to a saving income of Rs. 6,50,000 per month. He is very happy and satisfied with the sheep farming and he is the proud farmer in the taluk. He advises the unemployed youth to exploit such self employment opportunities for their livelihood and lead a happy and peaceful life instead of migrating to urban areas, working for long hours and spending huge amount on food and transportation and leading un satisfied life. Mr. Sampath Kumar has become one of the progressive farmers in the district and he is also growing apple in one acre, guava (5 acre), curry leaves (1.5 acres), banana (2 acres), Maize (5 acre) and some vegetable and field crops.



Stall feeding



Fodder

(i) A young woman farmer reaps success through dairy farming (KVK, Alappuzha)

Smt. Sheeba Sadik, Chempagappallil, Eruva, Kayamkulam is a young enthusiastic woman farmer who proved that dairy farming is a profitable venture. She owns a dairy farm which is a model unit in Kayamkulam on which she bagged several awards and recognitions apart from the social status achieved. During 2018-19 she became a stakeholder of the KVK by being a partner farmer in the OFT on “Management of Urolithiasis in goat”. Following this, she attended several training programmes in animal husbandry, value addition, and vegetable cultivation in the KVK. After trying goatary and poultry enterprises she realized that dairy farming is the best activity suitable to her for earning a decent profit and had been continuing that for the last three years. She maintains 17 lactating cows and obtaining 225 litres of milk/day. For selling milk, she has found out an innovative way of entrusting newspaper boys to distribute in houses along with newspaper in Kayamkulam municipality and could thus offer additional employment to 10 persons. Meanwhile she started value addition of milk also and help other farmers in this aspect.

From dairy unit Smt. Sheeba earns about Rs.33.27 lakhs with an expenditure of Rs.22.88 lakhs annually. In addition to her whole family, 3 labourers are engaged in the farming activities. Students and farmer groups from the different parts of district visit her farm. She could even handle class on how to identify a good animal by appearance for those who visited her farm. The social acceptance and recognition she and her



A view of dairy unit of Smt. Sheeba Sadik

family receive give them more satisfaction and joy in addition to the economic gains and higher living standards achieved. During the last three years, she has received many awards from the LSGs and Govt. Departments as best woman dairy farmer. KVK also honoured her on the occasion of International Women’s Day in 2020.

(j) Blending taste of coffee with the goodness of mushroom-A novel initiative in agripreneuership (KVK, Kollam)

Lalu Thomas, is a 45 year old *chef* an ex expatriate from UAE who lost his highly remunerative job due to the Covid crisis in 2019. The unexpected loss of job forced Lalu to return back to his native village, Thalavoor in Kollam district. Finding a job according to his expertise was very difficult. He started searching for other avenues for supporting his family. Mr. Lalu wanted to do something related to agriculture and food industry. Lalu’s mother used to cultivate mushroom in their home on small scale level and Lalu started cultivating the same. When Lalu started marketing of his produce he learnt many new lessons about the market demand, shelf life of mushroom and demand harvesting. The bigger challenge was the shelf life. Harvested mushrooms lost freshness within days this situation forced Mr. Lalu to think new methods for enhancing shelflife. Agricultural Officer, Thalavoor Krishi Bhavan advised Mr. Lalu Thomas to approach KVK, Kollam for support to solve problem of shelf life of mushroom. Then he attended training on value added products of mushroom organised by KVK. Major topics covered were, food safety standardization, nutritional quality, packing labeling, marketing, financial aid from related agencies etc. This programme motivated Mr. Lalu to develop Mushroom based products. Mr. Lalu juggled in different products based on mushroom viz. health drink, soup powder, dried items, snacks, chocolate, soap and so on. He started his production and research at his home with the guideline of KVK scientist. It was a great success. His products were launched during the 17th SAC of KVK Kollam by the then Director of Extension. Initially he faced constraints of rejected mushroom due to rotting but now the scarcity of mushroom become a problem.

Then, he got training and started mushroom spawn production. He continued experimenting in mushroom cultivation and product formulation. From this experimentation came the idea of mushroom coffee- Labae mushroom coffee. KVK Home Scientist helped him to successfully prepare an unique blend of coffee with different mushroom. Its nutrient value, shelf life, organoleptic evaluation studies were carried out under the supervision of KVK Home Scientist. District Industry Centre, included Mr. Lalu in PMFME scheme and he was able to establish his new unit with an outlay Rs. 10 lakh. Coffee bean for the product is being collected directly from farmers of Wayanad district.

Labae mushroom coffee is 70 Per cent mushroom and 30 Per cent powdered coffee bean. This mushroom coffee is a blend of five different mushrooms. Disinfected mushroom is solar dried using specially designed solar dryer and powdered using pulviser. Roasted and powdered coffee bean is blended with the mushroom. About 3000 kg fresh mushroom is required to make 250 kg finished product. The product was launched by the Hon'ble Minister for Industries, Law and Coir in the Government of Kerala- Adv. P. Rajeev in his chamber in the presence of Shri Arif, Hon'ble MP Alappuzha. The premium product of mushroom coffee is Rs 450/- per 100 gm. The company received 250 kg order from Abu Dabi based marketing company many other company also ready to place their order but raw material is the barrier. To address the problem KVK with Krishi Bhavan has initiated a model group based production at village level for mushroom production. Model mushroom village will open employment avenue for more than 300 youngsters, housewife and educated youth. The panchayat committee has decided to help this venture with the help of KVK and Department of Agriculture.

Mr. Lalu's success was covered by all leading channels, newspapers, PRD and FIB also facilitated his success he is now an invited guest for many entrepreneur development program. Last year he got an opportunity to address VIGA meet and this year he is going to present his success story at VIGA Thiruvananthapuram.



(k) Eco-friendly management of mango orchard (KVK, Palakkad)

Muthalamada located in the eastern region of Palakkad is famous for its vast mango orchards and is often known as mango city of Kerala. The intense cultivation of mango in the region has resulted in increase in pest and diseases. Recently climate change has also created several problems for mango farmers. Extended NE monsoon upto November-December has delayed flowering. Muthalamada mangoes were the first to reach the market. But they lost this advantage due to the change in rainfall pattern. Severe incidence of thrips in late flowering trees was yet another problem. Non judicious use of pesticides has also resulted in increase in pest. KVK, Palakkad had conducted OFTs in Muthalamada during the period from 2015-16 to 2017-2018 and developed a package for the management of mango hopper, a major pest in mango. Further, KVK has conducted regular capacity development programmes, technology demonstrations in mango on various production and crop protection aspects from 2017 onwards. Awareness is being created among the farmers on the importance of pruning and nutrient management, ill effects of non-

judicious application of pesticides and importance of adoption of eco-friendly measures

The technology popularized include pruning in May–June, integrated nutrient management including application of micronutrients based on soil test data, fertilisers application in split doses, correct method of application in the leaf canopy region, application of potassium nitrate for fruit retention, trunk application of *Metarrhizium anisopliae* for the management of mango hopper during the initial phase, application of neem based insecticides for the management of pests, need based application of pesticides, removal of dried branches after rainy season, followed by copper fungicide spray, spraying trifloxystrobin + tebuconazole for the management of anthracnose during vegetative and reproductive phases. Demonstrations were carried out in 8 plots. Application of *Metarrhizium* on tree trunks before flowering and application of azadirachtin and need based application of insecticide thiamethoxam could achieve 80% management of mango hopper. Thrips incidence was less in IPM plots. Application of *Verticillium* was found to reduce the incidence of thrips. The yield in IPM followed plots were 150 q/ha compared to 60 q/ha in control plots with BCR of 12.40. The farmers could fetch the advantage of early market as the pruning and proper nutrient management had improved the fruit set in demo plot. The farmers are slowly accepting the technologies demonstrated. More than 50 % of the mango farmers of Muthalamada adopted pruning and application of potassium nitrate and 75 % farmers adopted trunk application of *Metarrhizium anisopliae* for the management of mango hopper during initial stages.



(I) Ms. Suja - a blooming nursery entrepreneur (KVK, Pathanamthitta)

Ms. Suja, 35 years young entrepreneur hailing from Puthusheri Bhagom, Adoor is a successful nursery entrepreneur with well-equipped nursery in 50 percents of land by name Aswathy Gardens. She underwent training on Nursery production and management at KVK, Pathanamthitta under ARYA. Aswathy Gardens Nursery turned out to be a successful nursery and earns an average income of Rs. 50000 per month. She regularly engages three labourers in her nursery, hence has generated 480 man days of employment. Her nursery has a large collection of ornamental plants (Rose, eugenia, arelia etc.), budded fruit plants (Rambutan, Mango, Jackfruit, Mangosteen seedlings). On an average sale of 60,000 budded saplings/annum in root trainers, an innovative technique promoted by ARYA. She also supports her fellow trainees of the project by supplying seedlings for sale for exhibitions. An amount of Rs. 1.5 lakh was earned by the sale of seedlings supplied by her to her fellow trainees during Maramon Convention exhibition 2021-22.





3.1.11 Recognition and Awards

KVKs and contact farmers of KVKs in their respective districts have been recognized with the following awards during the reporting year:

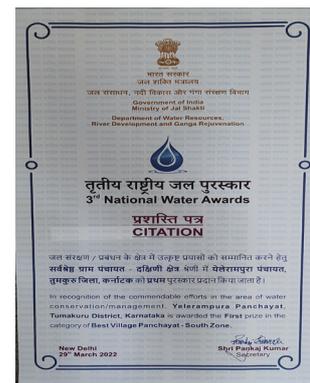
- The KVK Ramanagara functioning under University of Agricultural Sciences, Bangalore bagged the National Award “Pandit Deendayal Upadhyay Rashtriya Krishi Vigyan Protsahan Puraskar-2021” (2nd prize of Rs. 8.00 lakh) in recognition of its contribution to the benefit of farming community in Ramanagara district. Dr. Rajendra Prasad, S., Vice-Chancellor, UAS, Bangalore and Dr. Savita S. Manganavar, Senior Scientist and Head, ICAR-KVK, Ramanagara received the award during 94th Foundation Day of ICAR held on 16.07.2022 at AP Shinde Hall, NASC Complex, New Delhi.



KVK Ramanagara bestowed with ICAR National Award



- The KVK Tumakuru-II and Yelerampura Grama Panchayat of Karnataka were jointly awarded ‘Best Village Panchayat’- South Zone, First Rank under 3rd National Water Awards-2020, by Ministry of Jal Shakti, Government of India in recognition of climate resilient work carried out under the project National Innovations in Climate Resilient Agriculture (NICRA) in the area of water conservation and management at D. Nagenahalli village of Yelerampura Grama Panchayat, KolalaHobli, Koratagere Taluk, Tumakuru District, Karnataka since 2011. His Excellency, the President of India, Ram Nath Kovind presented the First Prize in 3rd National Water Award 2020 in New Delhi on 29 March, 2022 to Yelerampura Grama Panchayat. The award was received by Dr. N. Loganandhan, Senior Scientist & Head, KVK, Tumakuru-II and Smt Ganga Devi, President, Yelerampura Grama Panchayat, Kolala Hobli, Koratagere Taluk, Tumakuru District, Karnataka



His Excellency, the President of India, Ram Nath Kovind presented the award

- Shri Suresh Vishwanath Patil from Budhihal village of Nippani Taluk, Belagavi district is a humble person who is extremely passionate for innovation in agriculture, trained and guided by KVK Belagavi-I, has been recognized for his achievements and awarded with Pandit Deen Dayal Antyoday Puraskar which includes a certificate and Rs.50,000/- prize amount. For the sustainable water requirement, the farmer has developed

the Rainwater Harvesting Model. With one time investment of Rs. 42150, can recharge up to 3 lakh liters of water per day to borewell area and a modified silage machine with the expanded capacity of two tonnes per hour could prepare silage bags. Customized single bullock drawn equipment developed by him helps to reduce drudgery and also serves the purpose of ease of agriculture operations of small land holders.



Rainwater harvesting model



Modified silage machine



Customized single bullock drawn equipment



Receiving ICAR National Award

➤ Ms. Bindu Joseph, a young woman farmer from Kozhikode, Kerala won the prestigious Pandit Deen Dayal Upadhyay Antyodaya Krishi Puraskar 2021 instituted by the Indian Council of Agricultural Research, New Delhi for her contributions towards quality seedlings production and supply to the farmers. She received this National Award during 94th Foundation day of the ICAR held on 16th July 2022 at A.P. Shinde Hall, NASC Complex, New Delhi. The award recognizes the contributions of marginal, small and landless farmers for developing integrated and sustainable models of agricultural farming. Smt Bindu Joseph was nominated for this award by the ICAR- Krishi Vigyan Kendra, Peruvannamuzhi under the Indian Institute of Spices Research, Kozhikode, Kerala.

poisonous plant extract for pest management, calves feeding tub, animal lifting device, weed cutter, manure grinding and mixing machine and innovative intercropping in sugarcane. He received this National Award during 94th Foundation day of the ICAR held on 16 July, 2022 at A.P. Shinde Hall, NASC Complex, New Delhi.



Dr. Mohammed Idris Ahmed Quadri receiving ICAR-Haldar Organic Farmer Award 2021



Visit of Shri. Bhagwanth Khuba, Hon'ble Minister of State for Chemicals and Fertilizers, GoI

Ms. Bindu Joseph, Kozhikode, Kerala receives Pandit Deen Dayal Upadhyay Antyodaya Krishi Puraskar 2021

➤ Dr. Mohammed Idris Ahmed Quadri who is contact farmer of KVK Bidar has been awarded ICAR-Haldar Organic Farmer Award 2021 for his contribution on development and practice of new technologies like slurry digester,

➤ Shri. Mohammed Ameerbabu K. nominated by KVK Malappuram was awarded with ICAR-Jagjivan Ram Innovative Farmer Award 2021 during the occasion of the 94th Foundation Day of ICAR at New Delhi for his outstanding contributions in adoption, development and modification of innovative technologies for sustainable productivity and high profitability in agriculture. The award consisting of certificate, citation and a cash prize of Rs.1.00 lakh.



Shri. Mohammed Ameerbabu K receiving ICAR National Jagjivan Ram Innovative Farmer Award 2021

- The Udupi Kalparasa Coconut and All Spices Producer Company Limited (UKCAAS), started under the guidance of District Bharatiya Kisan Sangh and technically trained and guided by KVK Udupi, has received the Best Farmer Producer Organization Award at the national level for its contribution on improving the per tree production capacity

of Kalparasa and effectively marketing of its value added products like vinegar, jaggery and sugar. Shri Satyanarayan Udupa Japthi, Chairman of UKCAAS received the award during Agritech Summit and Awards ceremony held at ICAR, New- Delhi on 14 September, 2022.



Udupi Kalparasa Coconut and All Spices Producer Company Limited (UKCAAS), receiving Best Farmer Producer Organization Award

3.1.12 Doubling Farmer's Income

A total of 5193 successful DFI cases of farmers whose income was doubled with help of KVK interventions which included 3648 cases from Karnataka and 1545 cases from Kerala were compiled and submitted to ICAR for the national level documentation. The state-wise synthesis of more than 75000 farmers' success stories was published at the national level on the occasion of ICAR Foundation Day on 16 July 2022. This was part of the national initiative to commemorate the 75 years of India's Independence (*Azadi Ka Amrith Mahotsav*).

Karnataka

The average income of farm households supported by KVKs in Karnataka was more than doubled (2.47 times) between 2016-17 and 2020-21. Horticulture, the dominant source of household income, showed 2.5 times increase in its contribution to household income. The share of enterprises in household income, although small, experienced nearly four-

fold increase during the period. Livestock income increased by 3.1 times, consolidating its share in the household income to 11.26 per cent in 2020-21 from 8.98 per cent in 2016-17 (**Table 102**).

Kerala

The average income of farm households supported by KVK in Kerala was more than doubled (2.65 times) between 2016-17 and 2020-21. The share of enterprises in household income experienced 5.3 times increase, Enterprise share in the household income increased to 11.32 per cent in 2020-21 from 5.65 per cent in 2016-17. Fisheries income increased by 5.1 times, although its share in total income was negligible. Horticulture, the dominant source of household income, experienced 2.4 times increase in income due to KVK interventions. It is the major source of income before as well as after, with a share of 68.66 per cent and 62.73 per cent respectively. Its share in total income has marginally declined, but is still the biggest contributor to additional income with 59.15 per cent (Table 103).

Table 102: Level and change in household income of farmers under DFI in Karnataka

Crops and enterprises	Net income (Rs/household at current prices)		Increase in income (%)	Share in total income (%)		Share in additional income (%)
	2016-17	2020-21		2016-17	2020-21	
Field crops	78925	153727	94.78	30.65	24.17	19.76
Horticulture	144549	364361	152.07	56.13	57.28	58.06
Livestock	23104	71591	209.75	8.98	11.26	12.82
Fisheries	1921	7687	300.16	0.75	1.21	1.52
Farm and non-farm enterprises	8233	31801	330.38	3.49	6.08	7.84
Total	257512	636099	147.02	100.00	100.00	100.00

Table 103: Level and change in household income of farmers under DFI in Kerala

Crops and enterprises	Net income (Rs/household at current prices)		Increase in income (%)	Share in total income (%)		Share in additional income (%)
	2016-17	2020-21		2016-17	2020-21	
Field crops	18383	44569	142.45	11.78	10.77	10.16
Horticulture	107184	259671	142.27	68.66	62.73	59.15
Livestock	20160	54743	171.54	12.91	13.22	13.41
Fisheries	1574	8077	413.15	1.01	1.95	2.52
Enterprises	8818	46876	431.59	5.65	11.32	14.76
Total	156118	413936	165.14	100.00	100.00	100.00

3.2 Special Programmes

3.2.1 Cluster Frontline Demonstrations (CFLD) on Pulses under NFSM

ICAR-ATARI, Bengaluru has implemented the project on Cluster Frontline Demonstrations (CFLDs) on Pulses under NFSM with financial support from Department of Agriculture, Cooperation & Farmers Welfare (DAC & FW) through ICAR, New Delhi with an aim to enhance the production of pulses in the country and details are presented in **Table 104**. A total of 3670 CFLDs on different pulse crops were conducted by KVKs in 1468 ha.

During *kharif*, 1375 demonstrations were conducted by KVKs of Karnataka in 550 ha which include 80 ha on blackgram by involving 200 farmers, 120 ha on greengram by involving 300 farmers, 340 ha on pigeonpea by involving 850 farmers and 10 ha on Horsegram by involving 25 Farmers.

During *Rabi*, 950 demonstrations were conducted in 380 ha of which KVKs of Karnataka conducted 850 demonstrations in 340 ha that includes 10 ha on blackgram by involving 25 farmers, 10 ha on greengram by involving 25 farmers and 320 ha on chickpea by involving 800 farmers, and KVKs of Kerala conducted 100 demonstrations in 40 ha that covers 20 ha on blackgram by involving 50 farmers and 20 ha on greengram by involving 50 farmers.

During summer, 1345 demonstrations were conducted in 538 ha of which KVKs of Karnataka conducted 565 demonstrations in 226 ha that covers 110 ha on blackgram by involving 275 farmers, 80 ha on greengram by involving 200 farmers, 26 ha on cowpea by involving 65 farmers, 10 ha on horsegram by involving 25 farmers, and KVKs of Kerala conducted 780 demonstrations in 312 ha that covers 84 ha on blackgram by involving 210 farmers, 142 ha on greengram by involving 355 farmers and 86 ha on cowpea by involving 215 farmers.

Table 104: CFLDs on pulses under NFSM conducted by KVKs of Zone XI

Season	State	Crop	CFLDs on oilseeds	
			Area (ha)	Demonstrations (No.)
(a) Kharif	Karnataka	Blackgram	80	200
	Karnataka	Greengram	120	300
	Karnataka	Pigeonpea	340	850
	Karnataka	Horsegram	10	25
Total			550	1375
(b) Rabi	Karnataka	Blackgram	10	25
	Kerala	Blackgram	20	50
	Karnataka	Greengram	10	25
	Kerala	Greengram	20	50
	Karnataka	Chickpea	320	800
Total			380	950
(c) Summer	Karnataka	Blackgram	110	275
	Kerala	Blackgram	84	210
	Karnataka	Greengram	80	200
	Kerala	Greengram	142	355

	Karnataka	Cowpea	26	65
	Kerala	Cowpea	86	215
	Karnataka	Horsegram	10	25
Total			538	1345
Grand Total (a + b + c)			1468	3670



Blackgram (KVK, Bidar)



Chickpea (KVK, Belagavi-I)



Greengram (KVK, Kalaburagi-II)



Pigeonpea (KVK, Tumakuru-II)

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 and details are presented in **Table 105**. A total of 2340 CFLDs on different oilseed crops were conducted by KVKs in 936 ha.

During *kharif*, 450 demonstrations were conducted by KVKs of Karnataka in 180 ha which includes

50 ha on castor by involving 125 farmers, 40 ha on groundnut by involving 100 farmers, 40 ha on soybean by involving 100 farmers, 30 ha on sunflower by involving 75 farmers and 20 ha on niger by involving 50 farmers.

During *rabi*, 900 demonstrations were conducted in 360 ha of which KVKs of Karnataka conducted 800 demonstrations in 320 ha which covers 130 ha on sunflower by involving 325 farmers, 110 ha on groundnut by involving 275 farmers, 20 ha sesamum by involving 50 farmers, 40 ha on safflower by involving 100 farmers, 10 ha on linseed by involving 25 farmers, 10 ha on mustard by involving 25 farmers and KVKs of Kerala

conducted 100 demonstrations in 40 ha which covers 20 ha on groundnut by involving 50 farmers and 20 ha on sesamum by involving 50 farmers.

During summer, 990 demonstrations were conducted in 396 ha of which KVKs of Karnataka conducted 815 demonstrations in 326 ha that covers 260 ha on groundnut by involving 650 farmers, 46 ha on soybean by involving 115 farmers, 20 ha on sesamum by involving 50 farmers and KVKs of Kerala conducted 175 demonstrations on sesamum in 70 ha.



Castor (KVK, Tumakuru-I)

Table 105: 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	Castor	50	125
	Karnataka	Groundnut	40	100
	Karnataka	Soybean	40	100
	Karnataka	Sunflower	30	75
	Karnataka	Niger	20	50
Total			180	450
(b) Rabi	Karnataka	Sunflower	130	325
	Karnataka	Groundnut	110	275
	Kerala	Groundnut	20	50
	Karnataka	Sesamum	20	50
	Kerala	Sesamum	20	50
	Karnataka	Safflower	40	100
	Karnataka	Linseed	10	25
	Karnataka	Mustard	10	25
	Total			360
(c) Summer	Karnataka	Groundnut	260	650
	Karnataka	Soybean	46	115
	Karnataka	Sesamum	20	50
	Kerala	Sesamum	70	175
Total			396	990
Grand Total (a + b + c)			936	2340



Groundnut (KVK, Kalaburagi-II)



Linseed (KVK, Bidar)



Sesamum (KVK, Pathanamthitta)



Sunflower (KVK, Ballari)



Soybean (KVK, Belagavi-II)

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., Bagalkot, Bidar, Belagavi-II, Dharwad, Kalaburagi-II, Mysuru, Vijayapura-I and Mandya established Seed Hubs under ICAR-ATARI, Bengaluru and started functioning from 2016-17. Data in **Table 106** indicates that 2107.05 q pulse seed were produced by Seed Hub KVKs of which highest quantity produced was bengalgram (1000.50 q) followed by pigeonpea(684.35 q), greengram (203.20 q), blackgram (193.63 q), field bean (12.42 q), cowpea (9.65 q) and horsegram (3.30 q).

Table 106: Seed production of pulses through seed hubs under NFSM by KVKs of Zone-XI

Crop	Varieties	Seed produced (q)
Bengalgram	BGD-111-1, NBeG-47 and Jaki-9218	1000.50
Pigeonpea	TS-3R, GRG-811, GRG-152, BRG-5, BRG-3 and BRG-1	684.35
Greengram	DGGV-2, BGS-9, KKM-3	203.20
Black gram	DBGV-5 and LBG 791	193.63
Field bean	HA-3 and HA-4	12.42
Cowpea	KBC-9	9.65
Horsegram	PHG-9	3.30
Total		2107.05



Seed hub (KVK, Vijayapura-I)



Seed production of chickpea variety BGD-111-1 (KVK, Bagalkot)



Seed processing unit (KVK, Dharwad)



Seed production of greengram variety DGGV-2 (KVK, Dharwad)

3.2.4 National Innovations in Climate Resilient Agriculture

National Innovations in Climate Resilient Agriculture (NICRA) is a network project being implemented in the country to develop improved climate resilient technologies through research and to demonstrate the existing technologies on

farmers' fields under Technology Demonstration Component (TDC) through KVKs for enhancing climate resilience in agriculture. In ICAR-ATARI Bengaluru (Zone XI), climate resilient technological interventions are being implemented in farmer participatory mode in fourteen most climatically vulnerable districts namely; Chamarajanagara, Chikkaballapura, Chitradurga, Gadag, Haveri,

Kalaburagi, and Tumakuru in Karnataka, Alappuzha, Kannur, Kozhikode, Kottayam, Palakkad and Wayanad in Kerala and Lakshadweep Islands through respective Krishi Vigyan Kendras (KVKs) in these districts. Salient achievements during the reporting year are given below:

(a) Rainfall distribution

(i) Karnataka

The actual rainfall received was more than the normal rainfall in all NICRA districts except Kalaburgi where in the actual received annual rainfall was 5.20 percent less than the normal rainfall. However, crop production suffered in Gadag due more dryspell and also high intensity of rain leading to waterlogging for a long period. Whereas in Kalaburgi, crop production suffered due to two dryspell of >10 days in August and September, one dry spell of >20days in October besides recording 6.69 per cent less rainfall as compared to the normal rainfall of the district. The crop production during the year also suffered in Tumkur district due to excess rainfall of 99.71 percent with four intensive rainfall events and 42 days of waterlogging situation prevailed in the district.

(ii) Kerala

The actual annual rainfall received was less than normal in all NICRA districts except Kozhikode where in the annual rainfall was 62.42 per cent higher than the normal. The number of dry spell of >20 days were more in Kottayam, Kozhikode

and Wayanad districts. The high intensity rainfall events were more in Kannur with seven followed by four each in Kottayam and Palakkad, three in Alapuzha and one in Wayanad district. The number of waterlogging days recorded were 38 in Alapuzha and 11 in Palakkad district during the year.

(iii) Lakshadweep

Annual rainfall of 1727.2 mm was received in 128 rainy days, as against normal rainfall of 1237.0 mm which was 39.61 per cent higher than the normal. The two dry spell of >15 days, two dry spells of >20 days and four intensive rain spell were recorded.

(b) Demonstrations in Farming System Typologies (FST)

A total of 2122 demonstrations were implemented in different farming system typologies covering 1209.80 ha and 93 units in order to build climate resilience in cluster of villages covering fourteen climate vulnerability districts of KVKs in Zone XI. Out of which, 1949 demonstrations in 592.90 ha and 5 units were conducted by NICRA KVKs of Karnataka and 999 demonstrations in 177.00 ha and 88 units by NICRA KVKs of Kerala and 123 demonstrations in 0.60 ha by NICRA KVK Lakshadweep. State and NICRA KVK-wise details in each farming system typologies are presented in (Table 107). Further, the results of technological interventions implemented to achieve climate resilient typologies in NICRA villages during 2022-23 are presented in Table 108.



Ex-situ rain water harvesting through farm pond (KVK, Tumkur-11)



Construction of check dam for minimizing the drought

Table 107: Summary of interventions in farming system typologies carried out by KVKs under NICRA

Name of the KVK	FST-1		FST-2		FST-3		FST-4		FST-5		Total	
	Demo (No.)	Area (ha)	Demo (No.)	Area (ha)	Demo (No.)	Area (ha)	Demo (No.)	Area (ha)	Demo (No.)	Area (ha)	Demo (No.)	Area (ha)
Karnataka												
Chamarajanagara	112	34.00	149	35.00	39	25.00	95	28.00			395	122.00
Chikkaballapura	31	14.00	92	8.00	43	11.00	77	15.00	90	17.00	333	65.00
Chitradurga	39	18.00	37	20.00	101	27.50	85	28.90	-	-	262	94.40
Gadag	57	20.40	23	7.70	15	6.00	21	6.90	-	-	116	41.00
Haveri	57	20.50	62	20.50	99	26.00	55	18.50	-	-	273	85.50
Kalaburgi-I	40	16.00	40	6.00	25	11.00	25	11.00	-	-	130	44.00
Tumakuru-II	78 1 unit	25.00	126	44.00, 4 units	48	17.00	188	55.00	-	-	440	141.00, 5 units
Total	414 1 unit	147.90	529	141.20, 4 units	370	123.50	546	163.30	90	17.00	1949	592.90, 5 units
Kerala												
Alapuzha	77	15.40, 37 units	30	0.20, 20 unit	-	-	-	-	-	-	107	15.60 57 units
Kannur	40	6.00	41	0.80	-	-	-	-	-	-	81	6.80
Kottayam	62	31.50	31	31 units	-	-	-	-	-	-	93	31.50, 31 units
Kozhikode	60	5.300	60	5.30	20	2.00	25	0.80	-	-	165	13.40
Palakkad	150	23.00	7	2.00	5	0.200	1	0.60	-	-	163	25.80
Wayanad	105	38.00	125	5.00	90	20.1	70	20.80	-	-	390	83.90
Total	494	119.20	294	13.30, 31 units	115	22.30	96	22.20			999	177.00, 88 units
Lakshadweep	93	0.4	30	0.2					-	-	123	0.60
Grand total	1001	267.5, 37 units	853	154.70, 51 units	485	145.80	642	185.50	90	17.00	2122	1209.80, 93 units

Table 108: Performance of different interventions under various farming system typologies during 2022

FST	Intervention	Area (ha)	Farmers (No.)	Yields (q/ha)			Demo		Local	
				Demo	Local	Increase (%)	Net return (₹./ha)	BCR	Net return (₹./ha)	BCR
Chamarajanagara										
RF without animal	Improved variety + Soil test based fertilizer application on sun-flower	24.0	80	12.00	10.25	17.07	39160	2.29	29010	1.95
	Drought resistant Chickpea crop	3.0	7	16.25	12	35.42	37125	2.33	21125	1.79

RF with animal	Improved variety +Soil test based fertilizer application on sunflower	22.0	50	12.80	11.00	15.91	43510	2.43	33360	2.10
	Drought resistant Chickpea crop	3.0	8	17.00	12.50	36.00	40125	2.44	23125	1.86
Irr. without animal	Improved variety +Soil test based fertilizer application on sunflower	22.0	30	16.50	14.90	10.73	55760	2.40	46480	2.16
Irr. with animal	Improved variety +Soil testbased fertilizer application on sunflower	22.0	40	17.75	15.50	14.52	63010	2.58	49960	2.25
Chitradurga										
RF without animal	Groundnut + Redgram (8:1)	5.5	13	21.50	18.0	19.4	69000	2.73	40000	1.89
	Groundnut+ Castor (8:1)	6.0	15	22.0	18.5	18.9	73000	2.97	40000	1.89
	Groundnut + Feildbean (8:1)	6.5	11	23.5	17.5	34.2	66000	2.69	40000	1.89
RF with animal	Groundnut + Redgram (8:1)	4.5	12	22	17.9	22.9	76500	3.01	42000	1.95
	Groundnut+ Castor (8:1)	4.0	8	22.6	18.0	25.5	78300	2.96	42000	1.95
	Groundnut + Feildbean (8:1)	3.5	10	23.8	18.5	28.6	83200	2.98	42000	1.95
	Super Napeir	8.0	7	625	500	12.5	66000	3.75	58000	2.38
Irr. with animal	Fodder crops	7.0	13	650	520	19	38000	3.42	42000	2.47
Chikkaballapura										
RF without animal	Drou ghttolerantRagi varieties(KMR-316)	5.0	10	24.10	22.20	10.8	45175	2.33	42345	2.13
	Seed hardening with cac12 in pigeon pea	5.0	10	16.25	14.8	9.0	52937	2.01	43337	1.83
	Intercropping of groundnut + pigeon pea (10:2)	4.0	10	24.5	22.4	8.5	53650	2.32	51450	2.1
RF with animal	DroughttolerantRagi varieties(KMR-316)	4.0	10	23.50	21.90	7.3	43175	2.31	42345	2.13
	Resilient intercropping system of pigeon pea + horsegram	4.0	10	11.2	10.1	9	42150	2.24	40250	2.10
	Backyard poultry birds- kadakanath	200 nos	10	1.7	1.2	30	6825 /20 birds	1.83	6800 /20 birds	1.63
	Feeding of Sorghum CoFS-31 and mineral mixture for livestock	1.0	5	10.8 liters	10.1 liters	11.5	162/ day	2.74	154/ day	2.45
	Silage feeding during lean period to sheep	50 nos	5	33.40 kg	30.20 kg	9.5	28030 /5 sheep	2.07	25140 /5 sheep	1.85

Irr. without animal	Crop diversification with tomato	4.0	10	96 ton	88 Ton	8.3	262500	2.8	245600	2.4
	Sunflower variety KBSH-78	5.0	10	22.32	17.12	30	94587	2.87	68862.5	2.62
	Cowpea	2.0	10	12.5	10.2	18.4	43825	2.10	37250	1.72
Irr. with animal	Crop diversification with Brinjal	5.0	10	74.50	70.10	6	74500	2.42	70450	2.10
	Ground nut variety Kadiri lepakshi	2.0	5	23.0	21.5	6.5	65900	2.33	53900	2.08
	Feeding of Sorghum CoFS-31 and mineral mixture for livestock	1.0	5	11.2 liters	10.4 liters	7.15	175/day	2.82	154/day	2.45
	Backyard poultry birds- kadakanath	200 nos	10	1.7	1.2	30	6825	1.83	6800	1.63
Gadag										
RF without animal	Maize+ Redgram intercropping system	8.0	20	68.49	55.73	22.50	87751	2.78	65891	2.41
	High yielding and charcoal stem root rot resistant SPV-2217 variety of rabi sorghum	3.2	8	10.98	7.88	39.34	24938	2.48	14656	1.96
RF with animal	Maize + Redgram intercropping system	4.0	10	68.87	56.98	20.04	89284	2.84	70930	2.61
	High yielding and charcoal stem root rot resistant SPV-2217 variety of rabi sorghum	6.4	16	11.18	8.08	38.36	25835	2.55	15509	2.02
	Green fodder feeding with area specific mineral mixture for increasing milk productivity	0.5	5	8.20 Milk yield (lit./ day)	7.3 Milk yield (lit./ day)	12.32	37250	2.27	21903	1.58
Haveri										
RF without animal	Nutrient management in maize	4.0	10	49.13	43.63	12.6	46932	2.37	39080	2.25
	Nutrient Management through foliar application in Bt-Cotton	2.0	05	10.65	9.725	6.94	19450	1.26	11550	1.17
	Rabi sorghum variety (SPV-2217) and seed treatment with bio fertilizer	4.0	10	13.05	10.92	24	29237	2.62	18147	1.99
RF with animal	Nutrient management in maize	4.0	10	49.13	43.63	12.6	46932	2.37	39080	2.25
	Fodder sorghum (CoFS-31)	2.0	05	108	77.00	40.26	53300	2.25	40400	1.98
	Rabi sorghum variety (SPV-2217) and seed treatment with bio fertilizer	4.0	10	13.05	10.92	24	29237	2.62	18147	1.99
	Integrated seasonal health management in sheep	-	10	23.25	18.50	25.68	40350	2.37	26600	1.92

Irr. without animal	Nutrient management in Cluster bean	4.0	10	60.88	56.35	4.79	53000	1.77	50200	1.73
	Nutrient Management through foliar application in Bt-Cotton	2.0	05	10.65	9.72	6.94	19450	1.26	11550	1.17
	Green gram variety DGGV-2	4.0	10	6.16	4.85	27.00	17020	2.76	11170	2.09
	Rabi sorghum variety (SPV-2217) and seed treatment with bio fertilizer	4.0	10	13.05	10.92	24.00	29237	2.62	18147	1.99
Irr. with animal	Rabi sorghum variety (SPV-2217) and seed treatment with bio fertilizer	4.0	10	13.05	10.92	24.00	29237	2.62	18147	1.99
	Fodder sorghum(var. CoFS-31)	0.5	05	108	77	40.26	53300	2.25	40400	1.98
	Green gram variety DGGV-2	4.0	10	6.16	4.85	27	17020	2.76	11170	2.09
	Integrated seasonal health management in sheep	50 sheep	05	23.25	18.50	25.68	40350	2.37	26600	1.92
Kalaburgi										
RF without animal	Seed hardening, ridge and furrow, Nipping and use of pulse magic	10.0	25	9.90	4.30	130	37800	1.20	6600	0.28
RF with animal	Seed hardening, Variety (BGD 103) ,Chickpea magic spray	6.0	15	14.0	10.5	33.5	47500	2.1	31800	1.53
Irr. without animal	Bio fortified variety of wheat (UAS 375)	6.0	15	19.9	16.0	24.5	52150	2.98	39000	2.29
Irr. without animal	Ridges and furrow method of sowing in cotton	6.0	15	27.5	22.2	19	173250	2.86	134590	2.50
Tumkur-II										
RF without animal	Finger millet ML-365	10.00	22	22.3	17.2	29.65	25434	2.00	15086	1.63
	Pigeon pea BRG-2 & 4 +Finger millet	9.00	31	22.9	17.2	33.31	26132	1.95	15086	1.63
	Horse gram PHG-9	2.00	12	5.2	4.3	20.93	7662	1.54	4163	1.30
RF with animal	Finger millet ML-365	13.00	48	22.7	17.5	29.71	24901	1.97	14855	1.61
	Pigeon pea BRG-2&4 +Finger millet	16.00	55	23.3	17.5	32.86	25634	1.94	14855	1.61
	Horsegram (PHG-9)	3.00	16	5	4.2	19.05	21200	1.48	3678	1.26
Irr. without animal	Finger millet KMR630	8.00	8	23.1	17.8	29.78	26677	2.04	15516	1.62
	Pigeon pea BRG-2 & 4 +Finger millet	6.00	28	24.0	17.8	34.61	28151	2.01	15516	1.62
	Water saving Aerobic paddy Paustic-9	2.00	10	29.7	23.8	24.79	19024	1.73	10866	1.43

Irr. with animal	Finger millet KMR630	13	34	23.4	18.0	30.0	27432	2.06	16070	1.64
	Pigeon pea BRG-2 & 4 + Finger millet	8	32	24.3	18.0	34.94	29030	2.03	16070	1.64
	Water saving Aerobic Paddy Paustic-9	2	10	30.1	24.1	24.90	19783	1.75	11123	1.43
	Disease resistant Maize MAH-14-5	4	10	31.8	25.7	23.74	23974	1.91	16456	1.68
	Groundnut Kadri Lepakshi	1	2	8.1	6.1	32.72	35883	9733	1253	1.05
	Sorghum CoFS 29/31	2	21	1163.1	240.6	383.42	172488	5.68	21418	1.98
	Finger millet Indaf-7	13	16	27.4	-	-	35406	2.36	-	-
	French bean (S1 & Arka Arjun)	2	13	62.2	-	-	108825	3.82	-	-
Alapuzza										
RF without animal	Climate resilient practices for paddy in Kuttanad region	15.0	20	75.00	62.50	20.00	98400	1.87	63250	1.56
	Short duration cassava variety – Sree Jaya for escaping flood during monsoon season	0.2	10	175.00	162.50	7.69	162500	1.86	120000	1.58
	Modified season cultivation of HY ginger for vegetable purpose	0.2	10	262.50	Nil	NA	179000	1.74	Nil	
	Modified rain shelter for year-round vegetable	9 units	9	120 kg/unit/year	50 kg/year	140.00	25450	2.37	1200	1.15
RF with animal	Improved goat shelters to withstand water logging/flood	9 units (10 goats/unit)	9	17 kids/year	8 kids/year	112.50	57345	1.70	4419	1.10
Kannur										
Wetland	Revival of wetland ecosystem	6.0	40	56.00	34.00	64.00	60000	1.75	10000	1.13
Homestead without animal	Introduction of short duration turmeric variety Pragathi	0.40	12	22.95	-	-	18850	1.37		-
	Introduction of amorphophalus var Gajendra	0.40	3	37.5 0	-	-	56250	2.50		-
Kottayam										
Low land rice	Drum seeder technology to reduce seed rate	2.0	10	58.0	40.2	44.3	106160	2.59	96436	2.18
Wayanad										
Wetland	Demonstration of drone technology in rice	20 .0	30	62	51	22	79840	1.84	58820	1.69
	Mechanization in planting and weeding for paddy	10.0	25	53	47	12.77	69460	1.87	44540	1.50

Homes tead without IFS	Recycling of organic residues for crop production using bioinoculants	-	5	3	2	50	2100	2.86	1850	2.16
	Establishment of nutri-garden for improving nutritional security	0.1	25	0.9	0.65	38.46	960	1.89	444	1.57
Palakkad										
Rice based lowlands	Demonstration of UAV micronutrient application in paddy fields of Pattithara	15.0	20	37.80	24.70	0.5	60640	1.34	30660	0.79



Ridge and furrow method sowing in cotton (KVK, Kalaburgi-I)



Trenches for rain water conservation (KVK, Haveri)



Desilting and deepening of channels (KVK, Kottayam)



Improved technologies in tissue culture banana (KVK, Lakshadweep)

(c) Dissemination of climate resilient varieties

The climate resilient varieties emerged under NICRA demonstrations have been incorporated in *Kharif-2022* and *Rabi-2022* in the district plans of NICRA districts wherein a total of

137292 ha have been brought under climate resilient varieties through state department of agriculture in Chikkaballapura, Gadag, Chitradurga, Kalaburagi, Tumakuru, Alapuzzha and Kannur districts of Karnataka. The details are presented in **Table 109**.

Table 109: Dissemination of climate resilient varieties through state department plan during kharif and rabi 2022 in NICRA districts

Crop	Name of the KVK	Climate Resilient Varieties	Approx. area (ha)
Kharif -2022			
Ground nut	Chitradurga	Kadari Lepakshi, TMV-2	500
	Chikkaballapura	KCG-6	2983
Pigeon pea	Chitradurga	BRG-5	250
	Chikkaballapura	BRG-4	3140
	Gadag	TS-3R	8500
	Kalaburagi-I	GRG 811	18151
	Tumakuru-II	BRG-2	3310
Castor	Chitradurga	ICH-66	100
Finger millet	Tumakuru-II	ML-365	4260
	Chikkaballapura	KMR-316	18225
Cowpea	Chikkaballapura	KBC-9	169
Field bean	Chikkaballapura	HA-4	1838
	Chitradurga	HA-4,HA-5	100
Greengram	Gadag	DGGV-2	20000
Paddy	Kannur	Paddy seeds (Pournami, Akshaya)	4
	Kannur	Pournami	5
Total (A)			81535
Rabi-2022			
Cashew	Chitradurga	V-7, Bhaskar	50
Mango	Chitradurga	Alphanso	150
Guava	Chitradurga	L-49	50
Drumstick	Chitradurga	Bhagya	75
Amla	Chitradurga	Krishna	25
Tamarind	Chitradurga	PKM 1	20
Jamun	Chitradurga	Dhupdal	20
Red gram	Chikkaballapura	BRG-4	3140
Finger millet	Chikkaballapura	KMR-316	18225
Cowpea	Chikkaballapura	KBC-9	169
Field bean	Chikkaballapura	HA-4	1838
Ground nut	Chikkaballapura	KCG-6	2983
Bengalgram	Gadag	JAKI-9218	20000
Rabi Sorghum	Gadag	SPV-2217	9000
Paddy	Alappuzha	Short duration variety Manuratna	10
Pulses	Kannur	Green gram- BGS 9, Black gram-LBG 791	2
Total (B)			55757
Grand total (A+B)			137292

(d) Contingency measures taken up in NICRA village during dry spells

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 and Kerala. Contingency measures adopted to

overcome the impact of dry spells in crops such as groundnut, pigeonpea, cowpea, maize, finger millet, bengal gram paddy, pepper, coconut in the districts of Chikkaballapur, Chitradurga, Haveri, Gadag, Kalaburagi-I, Tumakuru-II, Wayanad and Palakkad have minimized the impacts and realized better yields over the farmer's practices (Table 110).

Table 110: Contingency measures to combat dry spells and its impact on crop yield under NICRA

Name of KVK	Dry spell (no. days)	Duration	Crop name	Crop stage affected	Intervention taken up	Farmers (No.)	Impact on crop yield (q/ha)		
							Farmers' practice	Demo	Increase (%)
Chitradurga	25	15 th Jan to 10 Feb	Groundnut	Pod stage	seed treatment with CaCl ₂ and foliar spray 19 all liquid fertilizers and inter cropping system	35	17.5	18.7	19.3
Chikkaballapur	13	10 th Sep – 23 rd Sep	Red gram	Vegetative	Nipping and pulse magic spray	25	14.8	16.25	9.0
			Groundnut	Peg formation	Before sowing gypsum application	14	21.5	23	6.5
			Cowpea	Flowering	Pulse magic spraying	04	10.2	12.5	18.4
	15	15 th Dec – 31 st Dec	Red gram	Flowering	Pulse magic spraying	25	14.8	16.25	9.0
Horse gram			-	Contingent crop	12	10.1	11.2	9.0	
Gadag	46	26 th Oct – 10 th Dec	Redgram	Flowering, pod setting and pod development stage	Foliar spray of KNO ₃ and 19:19:19 water soluble fertilizer	60	5.56	6.7	20.5
	17	15 th Dec – 31 st Dec							
Haveri	15	22 nd Oct – 2 nd Nov	Red gram	Flower initiation	Spraying of Pulse magic	50	15.0	7.5	100.0
	15		Maize	Cob initiation	Spraying of 19 all and Potassium nitrate	35	50.0	57.5	15.0
Kalaburagi-I	15	Oct 26 - Nov 10	Chickpea	Germination	Seed hardening with CaCl ₂	15	13.2	14.0	5.0
	08	Oct 21 - Nov 28	Pigeonpea	Flowering	Pulse magic spray	25	8.1	9.90	17.5
Tumakuru-II	11	26 th Jun - 8 th Jul	Finger millet	Establishment, Vegetative, Harvest	Finger millet KMR-630	112	18	23.4	30.0
	17	10 th Jul - 26 th Jul	Maize	Establishment, Vegetative, Harvest	Maize (MAH 14-5)	10	25.7	31.8	23.7

	34	9th Sep to 12 th Oct	Paddy	Establishment, Vegetative, Harvest	Aerobic Paddy Paustic-9	10	24.1	30.1	24.9
Wayanad	31	Jan 1-31	Pepper	Fruit development stage of berry	Mulching and Pochonia application	10	10.9	12.5	1.7

(e) 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 which was benefit to 1140 farmers. The details are presented in **Table 111**.

Table 111: Institutional interventions implemented under NICRA villages

Name of the KVK	Type of Institutional Interventions	Intervention (No.)	Farmers (No.)	Area/unit
Chitradurga	Introduction of forest trees like teak. Silver oak, mahaghani and hebbevu in community lands	1	53	12.0
Chikkaballapura	Construction of check dam for the community	3	60	3 units
Gadag	Custom Hiring Center	1	15	38.0
	Seed bank- Greengram -2q	1	40	16.0
	Seed bank- Pigeonpea-1.5q	1	50	20.0
Kalaburagi-I	Seed bank- Rabi Sorghum-1q	1	20	8.0
	Seed bank	1	4	0.8
Kalaburagi-I	Agrometeorology advisory services	1	85	66.0
	Seed production for the Introduction of Tuber crops (amorphophalus var Gajendra, yams variety Sree Neelima) as drought resilient crop	1	3	0.4
Kottayam	Custom Hiring Centre- Brush Cutter, Cono weeder, Paddy Seeder, Knapsack Sprayer and Submersible Slurry Pump	1	42	27.5
	Aerial Spray of Micronutrients in Paddy using Drone	1	42	27.5
	Soil health management through Soil health cards	1	42	27.5
	Climate resilient technology for mitigating flood by desilting and deepening channels in the paddy fields of flood prone area	1	42	27.5
	Agrometeorological advisory	1	42	
Palakkad	Drone application	1	50	48.56
	Agrometeorology advisory services	1	85	66.0

Wayanad	Storage of surface runoff rain through roads by water storage structures	1	80	-
	Demonstration of drone technology in rice for community-micro-nutrient spray	2	30	20.0
	Bund formation and fodder cultivation for the community	1	50	5.0
	Soil testing and health card distribution for better nutrient management	1	100	40.0
Kozhikode	World soil day celebration and soil health campaign	1	37	7.4
	Collected soil samples from selected coconut and vegetable growing farmers and distributed soil health cards		45	2.14
	Application of drone in paddy cultivation	1	20	2.0
Lakshadweep	ICAR-CTRCI	1	33	0.2
	ICAR-Directorate of Cashew	1	20	500 grafts
	ICAR- NRC Banana-Tissue culture	1	30	2000 plants
	ICAR-IISR	1	20	-
Total		29	1140	352.5

(f) Extension activities

A total of 101 extension activities have been carried out to create awareness among the community about the climate related impacts on the agriculture and related sectors through various activities with

the participation of 3161 farmers (Table 112). About 83 farmers were taken on exposure visits to various places/intuitions by the NICRA KVKs in order to expose the farmers to the on field climate smart technologies with the contention of seeing is believing.

Table 112: Extension activities organized by KVKs under NICRA

Name of the KVK	Type of extension activity	Extension activities (No.)	No. Farmer participated		
			Male	Female	Total
Chamarajanagara	Field Day	2	101	0	101
	Awareness	9	227	22	249
Chitradurga	Awareness	9	210	79	289
Chikkaballapura	Animal health camp	1	37	06	43
	Kisan mela	1	15	26	41
	Field day	1	22	04	26
Gadag	Method demonstration	7	157	0	157
	Group discussion	4	54	0	54
	VCRMC Meetings	5	65	0	65
	Exposure visits	3	83	0	83
	Kisan Mela	1	118	75	193
	Field days	3	131	16	147

Haveri	Soil health Camp	1	35	-	35
	Animal Health camp	1	41	-	41
	World Soil Day	1	80	-	80
	PM Kisan programme	1	21	-	21
Kalaburgi-I	Method Demonstration	01	47	04	51
	Animal Health Camp	02	67	11	78
	Field day	01	83	05	88
Tumakuru-II	Awareness	3	52	29	81
Alappuzha	Method demonstration	9	54	103	157
	Awareness programme	3	42	7	49
Kannur	Awareness programme	1	151	101	252
	Method demonstration	9	63	60	123
Kottayam	Awareness programme	6	105	47	152
	Celebration of Special Days	2	50	15	65
	Awareness	2	24	14	38
Wayanad	Method demonstration	2	17	11	28
	Awareness	3	40	33	73
Palakkad	Kisan Melas	1	46	7	53
	Animal welfare health camp	1	19	6	25
	Field day	1	9	3	12
	Awareness	2	77	69	146
Kozhikode	Workshop	1	19	6	25
	Awareness	1	26	14	40
Lakshadweep	Method demonstration	1	21	4	25
Total		102	2335	777	3186



Method demonstration (KVK,Lakshadweep)



Animal health camp (KVK, Haveri)

(g) Capacity development to farmers

KVKs have conducted 104 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 3364 farmers including 689 women. The details are provided in **Table 113**.

Table 113: Capacity development courses organized by KVKs under NICRA

Name of the KVK	Training Programme conducted (No.)	Farmer's (No.)		
		Male	Female	Total
Chamarajanagara	8	560	35	595
Chitradurga	14	330	76	406
Chikkaballapura	7	106	45	151
Gadag	13	289	27	347
Haveri	07	180	11	191
Kalaburgi-I	2	114	09	123
Tumakuru-II	1	129	19	148
Alappuzha	15	153	124	277
Kannur	3	44	48	92
Kottayam	11	257	82	339
Kozhikode	5	80	48	128
Palakkad	8	131	74	205
Wayanad	3	116	34	150
Lakshadweep	7	155	57	212
Total	104	2644	689	3364



Method demonstration (KVK,Lakshadweep)



Training on Integrated pest and disease management

3.2.5 Skill Development

Sixteen KVKs of Zone XI were sanctioned with programmes under skill development (Table 114)

for the year 2022. However, none of the programmes were started as on December 31 2022. The progress will be reported in the subsequent year.

Table 114: Skill training programmes sanctioned during 2022

State	KVK	Job Role/QPs of trainings
Karnataka	Vijayapura I	Small Dairy Farmer
Karnataka	Uttara Kannada	Small Mushroom Grower
Karnataka	Chikkamagaluru	Honey Bee Farmer
Karnataka	Yadgir	Garden Keeper
Karnataka	Kodagu	Garden Keeper
Karnataka	Tumakuru II	Small Mushroom Grower
Karnataka	Mysuru	Garden Keeper
Karnataka	Haveri	Small Dairy Farmer
Karnataka	Udupi	Honey Bee Farmer
Kerala	Malappuram	Garden Keeper
Kerala	Palakkad	Garden Keeper
Karnataka	Bagalkot	Small Organic Cultivator
Karnataka	Kalaburgi I	Small Dairy Farmer
Karnataka	Kalaburgi II	Small Organic Cultivator
Kerala	Ernakulam	Small Organic Cultivator
Lakshadweep	Lakshadweep	Small Organic Cultivator

3.2.6 Attracting and Retaining Youth in Agriculture

Attracting and Retaining Youth in Agriculture (ARYA) project is aimed at entrepreneurial development of youth in rural areas to take up different agriculture and allied sector enterprises for employment and sustainable income. ARYA KVKs have trained potential youth for establishing enterprises for self-employment. Six KVKs namely Bengaluru Rural, Uttara Kannada, Shivamogga, Kannur, Pathanamthitta and Malappuram have implemented the ARYA program in Zone XI. Under this program, 62 training programmes were organized wherein 917 youth were trained on various agricultural & allied enterprises viz. bee keeping, processing and value addition, mushroom

production, poultry, goat rearing and nursery (Table 115). As a result, 262 units were established (Table 116) and managed by the trained youth.

Table 115: Center-wise number of trainings organized and rural youth trained

KVK	Training organized (No.)	Youth trained (No.)
Pathanamthitta	25	228
Kannur	21	302
Uttara Kannada	6	121
Shivamogga	5	111
Malappuram	3	115
Bengaluru-Rural	2	40
Total	62	917

Table 116: Rural youth trained and units established

Name of enterprises	Rural youth trained (No.)	Units established (No.)
Processing and value addition	296	28
Bee keeping	233	96
Mushroom production	120	56
Nursery	104	19
Poultry and goat rearing	97	24
Coconut palm climbing	67	39
Total	917	262



Capacity development programme on coconut palm climbing under ARYA (KVK, Bengaluru Rural)



ARYA trainee Mr. Shijukumar established a nursery unit (KVK, Kannur)



Capacity development programme on bee keeping under ARYA (KVK, Pathanamthitta)



Supply of critical inputs to nersery enterprise trainees under ARYA (KVK, Uttara Kannada)

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, SwachhtaPakhwada was observed by the Institute and its KVKs during 16-31 December, 2022 and organized day wise activities as per the guidelines provided by the ICAR, New Delhi. KVKs organized various activities with



Oath taking of Swachhta Pakhwada
(ICAR-ATARI, Bengaluru)

the participation of 20625 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 12540 participants, KVKs of Kerala conducted swachhta activities by involving 8065 participants and KVK, Lakshadweep conducted swachhta activities by involving 20 participants.



Oath taking of Swachhta Pakhwada
(KVK, Gadag)



Swachhta Pakhwada
(KVK, Belagavi II)



Oath taking of Swachhta Pakhwada
(KVK, Pathanamthitta)

3.2.8 MeraGaon-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), Cochin 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. This apart 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.

3.2.9 District Agro-Meteorological Units (DAMU)

GKMS (Gramin Krishi Mausam Sewa) is the Government of India’s flagship initiative for weather-related services to farmers, aiding in decision-making on day-to-day agricultural operations. The GKMS is being implemented by Krishi Vigyan Kendras to meet block level weather needs of farmers at the micro level through establishment of DAMU (District Agricultural Meteorological unit) through a collaborative effort of IMD and ICAR.

Since 2019, DAMU Phase-I has been operational at 16 KVKs of ATARI, Bengaluru, with 12 KVKs in Karnataka, three KVKs in Kerala, and one KVK in Lakshadweep. DAMUs are interdisciplinary units with responsibility of preparing and disseminating agro-met alerts for districts and sub-districts. These 16 DAMUs developed 3225 agro advisories and disseminated to 299345 farmers using various communication methods. Further, these DAMUs have prepared 385 Agro advisories and disseminated to 74978 farmers *via.*, Kisan Portal. DAMU KVK’s have also conducted 343 farmer awareness programmes, benefiting 15448 farmers. Also developed 949 videos on district-specific weather-related topics, which were sent to 96589 farmers via registered what’sApp groups. The progress achieved by each KVK is given in **Table 117**. According to the feedback received from stakeholders, the AAS bulletins produced by DAMUs have been beneficial to the district’s farmers and extension workers. According to feedback from registered farmers, the bulletins and telephonic mode of contact were helpful during agricultural tasks such as field preparation, crop sowing, irrigation on non-rainy days, fertiliser application, and spraying during calm and clear weather conditions. Information about occurrence of dry spell, crop harvesting time and incidence of pests/diseases and their control measures were most useful to farmers

Table 117: Progress of DAMUs during 2022 under ATARI, Bengaluru

KVK	Agro advisories					Farmers awareness programmes		Videos developed and disseminated	
	Agro advisories generated (No.)	Farmers registered for agro advisories (No.)	Farmers benefitted (No.)	SMS sent through Kisan Portal (No.)	Farmers sent (No.)	Programmes (No.)	Farmers benefitted (No.)	Videos developed (No.)	Farmers benefitted (No.)
Karnataka									
Bagalkot	104	2000	5000	150	5000	36	1092	3	300
Ballari	104	19630	16570	09	9450	19	430	01	254
Chama rajanagara	104	16841	16841		-	28	1752	1	319
Chikk amagaluru	104	65890	65890	02	22669	37	1057	03	1546

Haveri	104	7962	7962	18	33500	22	986	12	3562
Kodagu	721	8342	6641	0	0	36	4445	3	4590
Kolar	104	8900	8900	-	-	12	638	1	1540
Koppal	104	14590	14590	-	150	25	914	4	4850
Mandya	104	14980	14980	-	-	24	879	02	2200
Rama nagara	1060	32300	29200	-	-	21	656	2	12000
Tumakuru	102	35000	53500	-	-	25	134	2	35000
Yadgir	104	6300	6050	02	245	25	1515	04	5274
Total	2819	232735	246124	181	71014	310	14498	948	66589
Kerala									
Kollam	104	15987	15987	-	-	9	349	-	-
Malap puram	102	2400	25000	104	100	1	50	1	30000
Palakkad	104	1626	12000	102	3864	6	1300	-	-
Total	310	20013	52987	204	3964	16	1699	1	30000
Lakshadweep									
Laksh adweep	96	243	243			7	140	-	
Grand Total	3225	252991	299354	385	74978	343	15448	949	96589



Automatic weather station (KVK, Haveri)



Famers awareness programme on DAMU (KVK, Mandya)



Radio talk on weather forecasting (KVK, Ballari)



Newspaper clipping on weather forecasting (KVK, Tumakuru-I)

3.2.10 Farmers FIRST

Farmer FIRST (Farm, Innovations, Resources, Science, Technology) initiative was launched by ICAR through Division of Agricultural Extension 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. Farmer FIRST Project (FFP) 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 by adopting 4220, 568, and 650 families, respectively.

The FFP institutes demonstrated technologies under different modules viz., crop, horticulture, livestock, NRM and IFS. A total of 81 demonstrations with 3216 farm families were conducted by FFP institutes under NRM module (4 demos with 91 families), crop module (23 demos with 1504 families), horticulture module (15 demos with 420 families), livestock module (27 demos with 1054 families having 6500 animals) and IFS module (2 demos with 147 families). Further, 361 extension programmes were organized by FFP institutes with the participation of 5775 farmers. Module wise progress of technological interventions is discussed below.

(a) NRM module

A total of 303 farmers were involved in demonstrations of improved technologies in 101.64 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 165 and 80 farmers covering 80.20 and 4.74 ha, respectively. ICAR-IIHR conducted demonstrations on crop residue management using Arka decomposer by involving one farmer covering 0.5 ha area.

(b) Crop module

Technology wise interventions implemented under crop module by FFP institutes presented in Table 118 shows that a total of 1679 farmers were involved in demonstrations of improved technologies on 608.72 ha spread over in different cluster of villages. Demonstration on integrated management of root (wilt) disease affected by coconut palms gave yield of 10976 nuts/ha/year with net return of Rs. 143036/ha as compared to 6108 nuts/ha with net return of Rs.54346/ha 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 groundnut (G252) was new to the farmers and there by net return (Rs.42600/ha) obtained is considered as additional income to the farmers.



Demonstration of crop residue management using Arka Decomposer (ICAR-IIHR, Bengaluru)



Biopod technology (ICAR-CPCRI RS, Kayamkulam)

Table 118: Technology wise interventions implemented under crop module by FFP institutes

Institute	Intervention/ technology	Farm ers (No.)	Area (ha)	Yield			Economics (Rs./ha)			
				Demo (q/ha)	Local (q/ha)	Increase (%)	Demo		Check	
							Gross return	Net return	Gross return	Net return
ICAR- CPCRI RS, Kayamkulam	Integrated root (wilt) disease management in coconut	105	55	10976 nuts/ ha	6108 nuts/ha	79.69	238392	143036	86268	54346
	Micro nutrient mix (KalpaVardhini) in coconut	70	37.5	8772 nuts/ha	6283 nuts/ha	39.61	184212	164212	110943	84200
	Sesamum (Kayamkulam- 1, TMV 6,7& 4), Thilak and INM	360	37.42	3.87	1.76	119.88	116100	76626	52800	25872
	Cowpea (Kanaka moni)	18	2.4	29.47	12	145.58	265230	188313	108000	58644
	Groundnut (G252)	12	2.4	0.71	-	100.00	56800	42600	NA	NA
	Soil and moisture conservation + INM in coconut palms	20	23	9976 nuts/ha	6536 nuts/ha	52.63	209496	138267	137256	66981
ICAR-IIHR, Bengaluru	Ragi (ML- 365)	420	168	52.50	25	110.00	190575	135000	90750	68,000
	Pigeonpea: BRG- 5 (Intercrop)	210	80	6.50	3.75	73.33	55,250	41,250	31875	20,000
	Field bean: HA- 4 (Intercrop)	110	20	6.20	3.0	106.60	55,800	38,800	27,000	15,000
	Horse gram (Intercrop)	200	08	6.00	4.0	50.00	43000	38,000	14000	10,000
ICAR- NIANP, Bengaluru	Ragi (ML- 365)	71	85	32	21	34.40	107200	64320	70350	42210
	Pigeonpea (BRG- 5)	83	90	11	7.5	31.80	121000	72600	82500	49500
	Total	1679	608.72							



Transplanted Ragi
(ICAR-IIHR, Bengaluru)



Intercropping in coconut
(ICAR-CPCRI RS, Kayamkulam)

(c) Horticulture module

Technology wise interventions implemented under horticulture module by FFP institutes presented in Table 119 shows that a total of 210 farmers were involved in demonstrations of improved technologies in 63.42 ha spread over in different cluster of villages. Demonstration on Gajendra variety of Amorphophallus as intercrop by ICAR-CPCRI RS gave yield of 480.00 q/ha with net

return of Rs. 1125600/ha as compared to 288.00 q/ha with net return of Rs. 624960/ha under check, demonstration on tomato (Arka Rakshak) with precision farming package by ICAR-IIHR gave yield of 74.50 q/ha with net return of Rs. 10,43,000/ha as compared to 38 q/ha with net return of Rs. 3,15,000 under check and demonstration on ridge guard (Arka Prasanna) by ICAR-NIANP gave yield of 64.6 q/ha with net return of Rs. 95150 as compared to 58 q/ha under check.

Table 119: Technology wise interventions implemented under horticulture module by FFP institutes

Institute	Intervention/technology	Farmers (No.)	Area (ha)	Yield			Economics (Rs./ha)			
				Demo (q/ha)	Local (q/ha)	Increase (%)	Demo		Check	
							Gross return	Net return	Gross return	Net return
ICAR-CPCRI RS, Kayamkulam	Amorphophallus (Gajendra)	42	12	480	288	66.67	1680000	1125600	1008000	624960
	Turmeric (Pragathi and Prathibha)	39	24.50	287.12	118	143.30	1292040	1098234	531000	371700
	Ginger cultivation-(IISR Varada)	7	0.84	142	84.6	67.84	497000	303170	253800	142128
	Integrated nematode management in coconut inter crops	10	3.5	Gall index -5	Gall index - 0	100.00	1120000	761600	Nil	Nil
	Tissue culture banana cultivation	40	0.88	200	125	60	400000	272348	250000	109480
ICAR-IIHR, Bengaluru	Tomato (ArkaRakshak) with precision farming package	20	4.6	74.50	38.0	96.05	10,43,000	7,93,000	5,32,000	3,15,000
	Chilli (ArkaHaritha) with precision farming package	21	4.8	33.25	16.0	107.81	7,98,000	5,18,000	3,84,000	2,24,000
	Brinjal with Precision farming package	04	0.8	61.25	33.00	85.60	5,51,250	3,20,000	2,97,000	2,05,000
ICAR-NIANP, Bengaluru	Beans (Arka Arjun)	11	3.4	31.6	24	24.6	205400	105750	156000	78000
	Ridge gourd (ArkaPrasanna)	7	4.5	64.6	58	9.2	158520	95150	145000	72500
	Okra (ArkaAnamika)	9	3.6	12.8	10.8	27.3	25640	15380	21600	12960
	Total	210	63.42							



Demonstration of Brinjal Arka Harshita
(ICAR-IIHR, Bengaluru)



Demonstration of amorphophallus variety Gajendra
(ICAR-CPCRI RS, Kayamkulam)

(d) Livestock module

Technology wise interventions implemented under livestock module by FFP institutes presented in **Table 120** indicated that a total of 1422 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.

Table 120: Technology wise interventions implemented under livestock and poultry module by FFP institutes

Institute	Intervention / technology	Farmers (No.)	Unit/No./ Area	Output		Increase of output (%)
				Demo	Local	
CPCRI RS, Kayamkulam	Cow mat for GAP in livestock units	22	82 animals	3204 liters of milk/year/cow (@ 17.8 liters/cow/day) Average 180 milking days	2193 liters of milk/year/cow (@ 12.9 liters/cow) Average 170 milking days	46.10
	Fodder cultivation (Susthira, Super Napier, CO-5)	52	8.2 ha	125 q/ha	25 q/ha	400.00
	Egg incubators- Poultry for mini units (5216 birds)	6	6 units	Rs. 1.128 lakh/unit /year	Rs. 0.35 lakhs / unit/year	222.28
	Duck incubator	2	2 unit	Rs. 9600/unit/year	Rs. 3200 /unit/year	200.00
	64 poultry units- 3000 birds- Gramapriya, Gramasree, BV 380	73	3400 birds	Rs.13895/day (@ 1985 eggs /day)	Rs.5118/day (@853 eggs/day)	171.49
ICAR-IIHR, Bengaluru	Sheep and Goat specific mineral mixture supplementation	110	1197 Animals(616 sheep + 581 Goat)	Coat health Fecundity Kid lamb mortality Total mortality Body weight	Coat health Fecundity Kid lamb mortality Total mortality Body weight	15.00 – 20.00

	Endo and ecto parasite control	79	866 Animals(413 sheep + 453 Goat)	Coat health Fecundity Kid lamb mortality Total mortality Body weight	Coat health Fecundity Kid lamb mortality Total mortality Body weight	20.00 – 30.00
ICAR-NIANP, Bengaluru	Animal health and fertility management	129	149 animals	1 insemination	3 inseminations	200.00% decrease
	Mastitis management	121	256 animals	Rs. 1360/- per animal	Rs. 350/-	74.00% reduction in veterinary expenses
	Mineral nutrition	103	109 animals	11.75 litres milk per animal	10.8 litres per animal	10.8% yield increase
	HACCP based quality milk production	650	852 animals	Rs. 400/- per animal	Rs. 310/- per animal	22.5% increase in income
	Fodder production and conservation	75	118 animals/67 acres	11.5 litres milk per animal	10 litres milk per animal	10.6 % increase in milk yield
	Total	1422				



Dairy farming (ICAR-CPCRI RS, Kayamkulam)



Deworming of goats (ICAR-IIHR, Bengaluru)

(e) Enterprise module

Technology wise interventions implemented under enterprise module by FFP institutes presented in Table 121 shows that a total of 457 farmers were involved in demonstrations of improved technologies in 399.75 ha. Demonstration on virgin coconut oil, vermin compost production and kalpakam kera pro bioproduction enterprises by ICAR-CPCRI RS gave annual income of Rs. 86000, Rs. 63480 and Rs.8581, respectively. ICAR-IIHR demonstrated ragi cleaning machine and mushroom cultivation. Milking machine as doorstep service demonstrated by ICAR- NIANP gave annual income of Rs. 112800 to each farmer.

(f) Integrated Farming Systems (IFS) module

Technology wise interventions implemented under IFS module by FFP institutes are presented in Table 122. A total of 217 farmers were involved in demonstrations of improved technologies on 70.5 ha spread over in different cluster of villages. Demonstration on IFS interventions and farm planning by ICAR-CPCRI RS gave annual income of Rs. 397350 /farmer. Demonstration on mixed cropping + livestock by ICAR-NIANP gave annual income of Rs.97800 per farmer.

Table 121: Technology wise interventions implemented under enterprise module by FFP institutes

Institute	Enterprise	Intervention / technology	Area (ha)	Farmers (No.)	Income of farmer due to intervention (Rs.)	Annual income of farmer before intervention (Rs.)	Annual income of farmer after intervention (Rs.)
CPCRI RS, Kayamkulam	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) Sesame Oil can also be extracted in this	58	7	62,000	24000	86000
	Vermicompost production unit	Three vermi compost units	43.75	3	63480	-	63480
	Kalpakam Keraprobio production unit	Nutrient mixture for coconut seedlings and bearing palms	280.00	331	8581	-	8581
	Turmeric processing	Turmeric boiler and Pulveriser	18.00	35	5500	17200	22700
	Mushroom units	Mushroom	-	4	4000	12500	52500
	Pathiyoor community coconut seedling unit	Seedling, bioprimered polybag WCT seedlings	-	1	Rs.624000	-	624000
ICAR-NIANP, Bengaluru	Milking machine as doorstep service	Youths identified and provided with milking machine for doorstep milking services	-	76	9400/- per month	-	112800/-
	Total		399.75	457			

Table 122: Technology wise interventions implemented under Integrated Farming Systems (IFS) module by FFP institutes

Institute	Intervention / technology	Area (ha)	Farmers (No.)	Income of farmer due to intervention (Rs.)	Annual income of farmer before intervention (Rs.)	Annual income of farmer after intervention (Rs.)
CPCRI RS, Kayamkulam	IFS interventions and farm planning	45.50	141	261750.45	135600	397350

ICAR-IIHR, Bengaluru	IFS in Mango based production system	15.00	30	38000 to 115000per acre	50000 per acre	88000 to 165000 per acre
	Dairy+ Poultry+ Honey Bee production	-	40	55000 to 145000	90000 to 120000	145000 to 265000
ICAR-NIANP, Bengaluru	Mixed Cropping + Livestock	10.00	6	11260	86540	97800
	Total	70.50	217			

(g) Capacity building programmes

A total of 54 capacity building programmes were organized under FFP wherein trained 1571 farmers. Details on thematic and institute wise capacity building programmes organized could be seen in Table 123.

(h) Extension activities

A total of 361 extension programmes were organized by FFP institutes with the participation of 5775 farmers. Extension activity wise number of programmes and participants of each centre could be seen in Table 124.

Table 123: Thematic area and institute wise capacity building programmes organized under FFP

Capacity building programmes								
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	1	41	2	47	4	48	7	136
Crop production	15	724	1	28	2	19	18	771
Entrepreneurship development	1	42	1	1	1	15	3	58
Farm implements	1	19	-	-	-	77	1	96
Livestock production and management	2	25	1	37	7	70	10	132
Natural resource management	1	20	-	-	-	-	1	20
Nutrition security	2	34	-	-	-	-	2	34
Plant protection	2	50	2	49	-	-	4	99
Processing and value addition	1	20	1	31	-	-	2	51
Production of inputs at site	1	24	-	-	-	-	1	24

Soil health and fertility management	1	20	1	36	1	14	3	70
Women empowerment	1	40	1	25	-	15	2	80
Total	29	1059	10	254	15	258	54	1571

Table 124: Extension activities organized by FFP institutes

Capacity building programmes								
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.)
Advisory Services	59	160	8	222	64	645	131	1027
Celebration of important days	3	31	1	190	7	166	11	387
Diagnostic visits	81	126	12	65	11	171	104	362
Exhibition	3	656	-	-	-	-	3	656
Exposure visits	0	0	2	34	-	-	2	34
Ex-trainees Sammelan	3	140	-	-	-	-	3	140
Farm Science Club	0	0	-	-	-	-	0	0
Farmers' seminar/ workshop	3	50	1	15	-	-	4	65
Field Day	26	535	-	-	-	-	26	535
Film Show	3	65	-	-	-	-	3	65
Group discussions	11	159	6	120	-	-	17	279
KisanGhoshi	0	0	-	-	2	116	2	116
KisanMela	1	772	1	56	-	-	2	828
Method Demonstrations	28	128	6	405	-	-	34	533
Plant/animal health camps	2	72	4	268	12	308	18	648
Any other	0	0	1	100	-	-	1	100
Total	223	2894	42	1475	96	1406	361	5775

3.2.11 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, 191704 farmers visited ATICs for obtaining solutions related to their agricultural problems. ATICs provided information related to various aspects of farming to 76064 farmers, both through print and electronic media. Technology products were provided to 102379 farmers. They received 3305 q seeds of various crops, 710213 planting material, 4209 poultry birds and 26196 q bio-products through ATICs. The prominent technological related services provided to farmers by the ATICs were agri-veterinary services (18076), soil and water testing (4846), kisan call center (1678) and kisan mobile advisory services (11947).

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 (DoE) under various state agricultural universities play an important role by providing technological backstopping to the KVKs under their jurisdiction. The DEs play a major role in coordinating and monitoring of KVK activities. During the year, Directorates of Extension organized 96 workshops and meetings. Directorates of Extension of SAUs in Zone XI participated in 44 scientific advisory committee meetings, 206 field days, 95 workshops/seminars, 21 technology weeks and 792 training programs. In addition, they have attended 9586 other programs including interface meetings, group discussion with KVK officials, annual review meeting, farmers meet, animal health camp and *Krishi Mela*. Directorates of Extension officials visited 130 on farm trials and 337 frontline demonstration plots to review and monitor the technology dissemination process at KVKs in the respective operational areas. The Directorates of Extension also undertook the technological backstopping by delivering 58 lectures, 582 TV talks, 79 radio talks and publishing 1093 news items in newspapers.



Chapter - 4

Research Projects

The ICAR-ATARI Bengaluru is undertaking research work besides the mandated activities related to KVKs coordination and monitoring.

This chapter consists of the following heads:

4.1 Institute Research Projects

4.2 Network Research Projects



4. Research Projects

4.1 Institute Research Projects

4.1.1 Project: AGEXATARI-XISIL202100100006

Title : Analysis of Integrated Farming Systems in different Agro-climatic situations in the state of Karnataka for need based Technology Application and Capacity Development.

Duration : January 2021-March 2024

PI : Dr.D.V. Srinivasa Reddy, Principal Scientist (Agronomy), ATARI, Bengaluru

Co.PIs : Dr.V.Venkatasubramanian, Director, ATARI, Bengaluru
Dr. M.J.Chandregowda, Principal Scientist (Agri. Extn), ATARI, Bengaluru
Dr. B.T.Rayudu, Principal Scientist (Agri. Extn), ATARI, Bengaluru

Field support team : Heads and selected SMSs of KVKs of Karnataka

Progress report

- Conducted the orientation workshop at three places covering all the 10 agro climatic zones of Karnataka. Broadly identified the prominent IFS models practiced by the farmers in each of the agro climatic zone and educated the field data collection staff on the data collection part.
- Questionnaire developed for the project of both Part-I and II have been pre tested and modified based on the feedback of the stakeholders.
- The work of data capturing in each of the identified IFS models and soil sample

collection is in progress at all the 10 agro climatic zones. Soil samples collected in 106 farmers' fields and 19 part-I of questionnaire filled. As on date 136 IFS models are identified across ACZs and 146 questionnaire part-II were filled.

- The spread sheets in excel format also developed and supplied to the field staff for entering the data in the spread sheet as and when data collection in questionnaire is completed.

4.1.2 Project: AGEXATARI-XISIL202100200007

Title : Assessment of Technological and Capacity Needs perceived by Dairy Farmers and Extension Functionaries in Karnataka state

Duration : January 2021 -March, 2024

PI : Dr. D.V. Kolekar, Scientist, ICAR-ATARI, Bengaluru

Co-PIs : Dr. B. T. Rayudu, Principal Scientist, ICAR-ATARI, Bengaluru
Dr. V.Venkatasubramanian, Director, ATARI, Bengaluru

Progress Report

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 - Assessment of Technological and Capacity Needs perceived by Dairy Farmers and Extension Functionaries in Karnataka state. The interview schedule has been prepared by keeping in view various objectives, variables of the study and other important aspects such as statistical analysis. It is prepared in the google forms and data collected with the help of mobile. Completed data collection from 510 farmers and 102 field veterinarians. As per IRC suggestion, sample size have been increased from 8 KVKs to 17 KVKs jurisdiction area for collecting data. The collected data has been entered in excel sheet with specific

codes, master table is prepared. Data analysis is completed and final report presented during IRC. Major research findings are given below:

- Majority dairy farmers of both the categories were having good knowledge and adoption level about most of the breeding, feeding, housing, health care, general management and clean milk production practices. However, knowledge and adoption level for practices such as 'Right time of AI after heat', 'Use of quality animals for breeding', 'Feeding of concentrates and green fodder', 'Feeding of mineral mixture silage', 'Balanced ration feeding', 'Feeding of special ration during parturition and pregnancy', 'Vaccination of FMD and HS', 'Deworming of adults and calves', 'Proper treatment of repeat breeders', 'Ecto-parasites control measures', 'Practice of heifer management', 'Treating lameness properly', and 'Various clean milk production practices' was much better in case of KVK adopted farmers as compared to non-adopted farmers.
- Majority dairy farmers of both the categories were having full to partial training needs about the breeding, feeding, housing, health care, general management and clean milk production practices such as 'Practice of keeping breeding records', 'Culling of low productive animals', 'Keeping the animal and newly born calf at warm place just after calving', 'Keeping of animal loose in the shed', 'Separate space for pregnant animals', 'Segregation of sick animals from healthy ones', 'Disinfection of the naval cord', 'Zoonotic diseases and its transmission', 'Quarantine practice', 'Common diseases and preventive measures' and 'Buy animals of known health status', 'Practicing de-horning in calf', 'Practicing animal castration', 'Practicing trimming of hoof', 'Practice heifer management', 'Maintaining of different records', 'Only buy animals of known disease status', 'Using proper identification for animals', 'Limit access to the outsider at farm', 'Storing waste in proper manner to minimize the risk of environment pollution', 'Following eco-friendly practices', 'Removal of hair around udder and flank regularly', 'Remove first two stream of milk from each teat', 'Keep the animal standing after milking for at least 15 minutes' etc. Majority of the extension functionaries were having full to partial technological and capacity needs in all the listed areas.
- KVK adopted households had more number of milking dairy animals (3) as compared to KVK non-adopted (2). Average quantity of dry fodder and concentrates fed per animal in case of KVK non-adopted cluster was 6.79 and 3.96 kg, respectively. This was more as compared to KVK adopted cluster (6.55 and 3.50 kg resp.). But, average quantity of green fodder fed per animal in case of KVK non-adopted cluster was less (17.87 kg) as compared to KVK non-adopted cluster (18.87 kg). Thus, total feed cost and expenditure per animal was more in case of KVK non-adopted cluster (Rs.116.69 and 161.72, resp.) than KVK adopted cluster (Rs.110 and 155.10 resp.). In all the cases, KVK adopted cluster dairy animals were producing more milk (10.11 L/anim./day) as compared to KVK non-adopted cluster (8.71 L/day). Dairy animals required less expenditure on health per day/anim. (Rs.5) but the net return/day per animal (Rs.127.57) was more in case of KVK adopted cluster as compared to KVK non-adopted cluster (Rs.81.18).
- Net return/day per animal (Rs.127.57) and per farm (Rs.291.22) was more in KVK adopted cluster as compared to KVK non-adopted cluster (Rs. 81.18 and 160.97, resp.). Without considering cost of fodder, net return/day per animal (Rs.182.14) and per farm (Rs.415.51) was more in KVK adopted cluster as compared to KVK non-adopted cluster (Rs.135 and 265.26, resp.). Protein, fat and calcium nourishment per animal to the family gm/day was almost similar in case of KVK adopted cluster (52.48, 67.24 and 1.968, resp.) with that of KVK non-adopted cluster

(53.44, 68.47 and 2.004, resp.). Nutrients to farm i.e. NPK kg/year/animal was also almost similar in case of KVK adopted cluster (67.60, 33.80 and 135.20, resp.) with that of KVK non-adopted cluster (67.22, 33.61 and 134.44, resp.). Employment generation (Man days/year) per animal was more in case of KVK adopted cluster (107.22) as compared to non-adopted cluster (105.39).

- Poor economic condition, high cost of treatment, no access to credit facility, high cost for feeding and costly wages for workers were perceived as the major constraint by 100 per cent farmers of the both the categories. Constraints such as disease incidence, longer inter-calving period, non-availability of grazing land, longer maturity age, poor milk production, poor mass media or extension agency contact, unavailability of improved technologies, lack of knowledge on improved practices, unavailability of extension advisory services, unavailability of veterinary services in time and poor supply of quality semen were the other important constraints were perceived by farmers of both the categories. Constraints such as lack of organized market, lack of market demand and competition from commercial dairy were perceived as less important by almost all the farmers of the both the categories.
- The significant differences in milk production parameters and components of livelihood security in case of KVK adopted and non-adopted farmers were due to efficient and scientific nutritional and health management practices in case of KVK adopted cluster. The potential to enhance the productivity of the dairy animals through professional farm management and superior nutrition is immense. Dairy animal's productivity can be improved with organized breeding programs, better management practices to hasten the efficiency of milk production and livelihood security of resource poor farmers.

4.1.3 Project: AGEXATARIXISIL-201900100004

- Title** : Study on Agri based Entrepreneurship Development among Youth
- Duration** : January 2021 -December, 2024
- PI** : Dr.Thimmappa K, Principal Scientist (Ag. Economics), ICAR-ATARI, Bengaluru
- Co-PIs** : B.T.Rayudu, Principal Scientist (Agri. Extn), ICAR-ATARI, Bengaluru

Dr.D.V.Kolekar, Scientist (Agri. Extn), ICAR-ATARI, Bengaluru

Progress report

The literatures were collected and reviewed on aspirations of youth, perception of youth towards farming, perception of youth towards agro-enterprises, performance of agro-enterprises and constraints faced by the youth. The interview schedule has been prepared by keeping in view objectives and variables of the study. The data were collected from 199 trainee respondents to know the perception about the farming and agro-enterprises. The enterprise specific data also were collected from 120 respondents of coconut climbing and honey bee enterprises. The analysis of the data has been done keeping in view of the objectives of the study. Results are presented below:

- Data indicated that pests and disease outbreak, access to credit, adverse weather conditions and availability of water/irrigation are the main factors limiting rural youth in adopting agriculture as an occupation.
- Majority of youth (68%) belongs to small and medium farming category. Education and marital status influenced perceptions of youth towards agro-enterprises.
- Annual income of entrepreneurs ranged from Rs. 31000 to Rs. 151000. Reasons for selecting all enterprises except bee keeping is to earn

additional higher income. Contribution of annual enterprise income to total household income ranged from 19 percent to 64 percent.

- Intensive study is in progress regarding performance of agro-enterprises and constraints faced by youth in the management of agro- enterprises. The detailed results will be presented during the IRC meeting.

4.1.4 Project: AGEXATARI-XICIL202100300008

- Title** : Impact Assessment of Arka Technological Products Implemented by Krishi Vigyan Kendras of Karnataka and Kerala
- Duration** : January 2020 – December 2024
- PI** : Dr.Thimmappa K, Principal Scientist (Ag.Economics), ICAR-ATARI, Bengaluru
- Co-PIs** : Dr.N. Loganandhan, Principal Scientist and Head, KVK, Tumakuru-II
Dr.V. Venkatasubramanian, Director, ICAR-ATARI, Bengaluru

Progress report

Study on “Impact Assessment of Arka Technological Products Implemented by Krishi Vigyan Kendras of Karnataka and Kerala” is being under taken to assess the effectiveness of technological interventions on input use and productivity improvements on different crops; to study the economics of technological interventions implemented by KVKs and to identify constraints faced by KVKs as well as farmers while implementing technological interventions. The project was presented in the Institutional IRC Seminar on 03.09.2020. The project work is under progress. Literature reviews were collected and the interview schedule is prepared by considering the variables and study objectives. Data have been collected from 104 farmers who have adopted Arka varieties and remaining data will be collected during 2023, as per the suggestions of IRC recommendations.

4.1.5 Project: AGEXATARI-XISIL202100400009

- Title** : Identification and development of farm leaders through KVKs for up-scaling agricultural technologies in Karnataka, Kerala and Lakshadweep.
- Duration** : September 2020 – August 2024
- PI** : Dr. BT Rayudu, Principal Scientist (Agril Extn), ICAR ATARI, Bengaluru
- Co-PIs** : Dr.M.J.Chandre Gowda, Principal Scientist (Ag. Ext.)
Dr.D.V.Srinivasa Reddy, Principal Scientist (Agronomy)
Dr.Thimmappa K, Principal Scientist (Agri. Economics)
Dr.D.V.Kolekar, Scientist (Ag. Ext.)
Dr.M.B.Hanji, Chief Technical Officer
Dr. V.Venkatasubramanian, Director, ICAR-ATARI, Bengaluru

Progress report

The project was carried out during the period under report focusing on first and second objectives. A total of 7500 farm leaders were identified of which 5247 farm leaders from Karnataka (33 KVKs), 2226 farm leaders from Kerala (14 KVKs) and 27 farm leaders from Lakshadweep (KVK Lakshadweep). Structured questionnaire has been prepared on identification of capacity development needs among identified farm leaders. Data were collected from the sample size of 425 designated farm leaders on the degree of training needed in each specific area under major subject areas as well as their profile. Based on the training need analysis, KVKs have formulated training courses to build the capacity of farm leaders in their respective districts. Analysis of farm leaders profile data and organization of training courses for the farm leaders are under progress.

4.2 Network Research Projects of Agricultural Extension Division of ICAR

4.2.1 National network project: AGEXATARI-XICIL202000100005

- Title** : Impact of ARYA on promotion of agri-preneurship and alternative livelihoods
- Duration** : January 2021-October 2023
- PI** : Dr.M.J.Chandre Gowda Principal Scientist (AE), ICAR ATARI Bengaluru
- Co-PIs** : Dr. P. Adhiguru, Principal Scientist, Ag. Extn Division, ICAR New Delhi
Dr. Lakhan Singh, Director, ICAR ATARI Pune
Dr. P. P. Pal, Principal Scientist, ICAR ATARI Kolkata
Dr. Rajesh Rana, Principal Scientist, ICAR ATARI Ludhiana
Dr. M. S. Meena, Principal Scientist, ICAR ATARI Jodhpur
Dr. R. Bordoloi, Principal Scientist, ICAR ATARI Umiam/ Guwahati
Dr. S.K. Dubey, Principal Scientist, ICAR ATARI Kanpur
Dr. Amrendra Kumar, Principal Scientist, ICAR ATARI Patna
Dr. A. Bhaskaran, Principal Scientist, ICAR ATARI Hyderabad
Dr. K.Thimmappa, Principal Scientist, ICAR ATARI Bengaluru
Dr. A.A.Raut, Scientist, ICAR ATARI, Jabalpur

Progress Report

The project proposal was prepared by pooling the available secondary data and experiences of each ATARI with respect to ARYA. Expertise from all

the ATARIs was pooled in the form of one CoPI from each ATARI and by enlisting all the 25 first phase ARYA implementing KVKs as CCPIs. Mid term progress report was presented before RAC on 21.02.2022.

Altogether, data have been elicited from 2773 respondents (both individual and groups) under four category of respondents viz., (a) Functional Units: Responses have been collected from 841 functional units which includes 684 individual units and 157 group units. (b) Non-Functional (Started, but discontinued): Responses have been collected from 406 Non-functional units which includes 349 individual units and 57 group units. (c) Not started: Responses have been collected from 454 Not-started units which includes 433 individuals and 21 groups. (d) Control: Responses from 1072 individuals have been elicited to serve as control group. Preliminary results based on Functional Units are given below:

- On an average each unit functioned for 179 days during 2017-18, 206 days during 2018-19, 226 days during 2019-20 and 253 days during 2021.
- There was difference in the operational duration of group and individual enterprises. The groups worked on an average 25 days more than individual units during 2017-18 to 2019-20. However, the gap was reduced to 10 days during 2020-21 (261 days and 251 days). Operational duration was highest for goat enterprise (average 351 days) and least for mushroom (199 days).
- The average gross turnover increased from Rs.197163 (2017-18) to Rs.328499 (2020-21), which indicated the slow and steady progress in the enterprises. The average gross turnover among group units was higher among group units Rs. 420986 (2017-18) to Rs. 652364 (2020-21) compared to Rs. 149736 and Rs.2542053 respectively for individual units.
- There was huge variation in the gross returns among enterprises. Gross returns during

2020-21 was least with vermicompost enterprises (Rs.39082) and highest for nursery units (Rs.679459) and Processing units (Rs.775084).

- Average net income increased from Rs. 92276 during 2017-18 to Rs. 197553 during 2020-21. During 2020-21, highest net income was achieved with nursery enterprises (Rs.484556) and the least was with vermicomposting (Rs.29410).
- BC ratio was least for processing and value addition (1.61) whereas it was highest for goat rearing (5.47) and piggery (4.68). BC ratio values indicated better resource use efficiency among individual units with a higher BC ratio of 2.30 (2017-18) to 2.70 (2020-21) compared to 1.46 to 2.23 for group units for the corresponding years.
- Employment generation (person days) increased from 272 during 2017-18 to 352 during 2020-21. There was an increasing trend over the years. On an average, each enterprise generated about 1.5 days of employment for every operational day of the enterprise. Group units generated more employment 268 to 423 person days during 2017-18 to 2020-21 as compared to 276 to 336 person days for individual units. Employment generation was highest with fisheries (868 person days) and goat rearing (525 person days) during 2020-21 compared to other enterprises.
- The initial assessment of the investment support received by the ARYA enterprises indicated that about one third of the units received credit support from banks and cooperatives. About 21 per cent of the units received subsidy support available under some ongoing schemes of the central/state governments. About 63 percent of the enterprises received grants in kind under ARYA project. Almost every unit (96.6 %) invested from their own sources to establish and run the enterprises. The value of support received under ARYA was to the tune of

Rs.52030, whereas the amount of subsidy availed was Rs. 113383 and the credit support was to the extent of Rs.146061.

Data of Non-Functional, Not-started and Control categories is being cleaned and will be subjected to analysis during January to June 2023. To analyze the influence of successful agri-entrepreneurship on other enterprises/ entrepreneurs is being done through CASE STUDY approach. Semi-structured interview schedule has been developed. Case study will be conducted during April to September 2023.

4.2.2 Other national network projects

There are six other Network Research Projects wherein ICAR-ATARI, Bengaluru is Cooperating Centre with Co-PIs which are given below:

- i. Impact assessment of popular pulses varieties and technologies disseminated by KVKs through Cluster Frontline Demonstration of Pulses (CFLD-P) in India (Co-PI: Dr.B.T.Rayudu, Principal Scientist (Agricultural Extension)).
- ii. Impact of Climate Resilient Technologies in Different Agro - climatic zones in India: A Study in National Innovations in Climate Resilient Agriculture (NICRA) Project Areas (Co-PI: Dr.D.V.S.Reddy, Principal Scientist).
- iii. Assessing Impact of Nutri-SMART Village on Dietary Pattern, Consumption Level and Food Availability in India (CoPI: Dr.D.V.Kolekar, Scientist (Agricultural Extension)).
- iv. Impact assessment of KVKs interventions on Doubling Farmers' Income (DFI) (CoPI: Dr. M. J. Chandre Gowda, Principal Scientist).
- v. Analysis of agricultural programmes conducted in Aspirational Districts in India (Co-PI: Dr.B.T.Rayudu, Principal Scientist).
- vi. Impact of Technological Interventions of KVKs on Socio-Economic Empowerment and Sustainable Livelihood Security of Tribal Farmers (CoPI: Dr.D.V.Kolekar, Scientist (Agricultural Extension)).

4.2.3 New Extension Methodologies and Approaches (NEMA)

PI : Dr.M.J.Chandre Gowda Principal Scientist (AE), ICAR ATARI Bengaluru

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

Dr.B.T.Rayudu, Principal Scientist (Agri. Extn)

Dr.Thimmappa K, Principal Scientist (Agri. Economics)

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

Eight national network projects implemented through ICAR-ATARIs across the country are being monitored under the project on New Extension Methodologies and Approaches (NEMA) of Agricultural Extension Division of ICAR, New Delhi.



Chapter - 5

Publications

Publications of scientists of ICAR-ATARI as well as KVKs of Zone XI are presented broadly under the categories such as research papers, papers presented in conferences, training manuals/technical bulletins, popular articles, books, books chapters and reports during the period under report.



5.1 Research Articles by ICAR-ATARI Bengaluru

Chandre Gowda M.J., Shrishail S Dolli, Sreenath Dixit, Durga Prasad M.V. and Saravanan D. 2022. Farmers decision making on agricultural innovations: A process analysis. *Indian J. of Extn. Edn.*, **58** (2): 8-14.

Chandre Gowda M.J., Ravi Y and Netravati Yattinamani. 2022. Somatic status and dietary pattern of farm families in the rural areas of Karnataka state. *The Pharma Innovation Journal*, **11**(10):2393-2399.

Singh A.K., Keshava, R.R. Burman, S. Paul, S. Som, A. Kumar, B.C. Deka, A.K. Tripathi, Y.G. Prasad, A. Singh, R. Singh, L. Singh, S.S. Singh, S.K. Singh, M.J. Chandre Gowda, A. Mishra and V.P. Chahal. 2022. *Indian Journal of Agricultural Sciences*, **92**(3):362-6.

Naveenkumar G S, Mallikarjun B Hanji, MJ Chandre Gowda, K N Krishnamurthy, DM Gowda, KB Umesh, K P Suresh and S. S. Dolli. 2022. Analysis of socio-economic and other farm level factors for farmer decision making pattern in adopting agricultural innovations in Karnataka. *The Pharma Innovation Journal*, **11**(11):811-814.

D. V. Srinivasa Reddy, P. R. Ramesh, R. Manjunath, N. H. Bhandi, M. N. Malawadi, and M. S. Savitha, 2022. Rainwater Harvesting Technologies in Arid and Semi-Arid Region of Karnataka to Mitigate Climate Change Impacts, *Mysore J. Agric. Sci.*, **56** (1) : 341-348 (2022).

5.2 Books/Technical Reports by ICAR-ATARI Bengaluru:

Birthal P. S., Chandre Gowda M J., Rajesh K Rana, 2022. Doubling Farmers Income: Statewise Synthesis. Indian Council of Agricultural Research, New Delhi. Pp95.

Loganandhan N, Ramesh P.R., Praveen Kumar, Hanumathegowda B, Prashanth JM, Jagadish K.N., Somashekhar, Radha R. Banakar, Venkatasubramanian V, D.V.S. Reddy and

J.V.N.S., Prasad, 2022. National Initiative on Climate Resilient Agriculture (NICRA)-A case study from D. Nagenahalli village of Tumkur district, Karnataka. Published by ICAR KVK (IIHR)), Horehalli, Tumkur, Karnataka. pp76.

M.V., Ravi, D.V., Srinivasa Reddy, Fakeerappa Arabhanvi and Mamatha Madli, 2022. DAMU-Innovative Scheme for weather forecast and agro-advisories in Koppal district. ICAR-KVK, Koppal, University of Agricultural Sciences, Raichur, Karnataka. UASR/PC/TB-19/2021-22. pp29.

Annual Report 2021 (2022), ICAR Agricultural Technology Application Research Institute (ATARI), (Eds: M.J. Chandre Gowda, D.V. Srinivasa Reddy, BT Rayudu, K. Thimmappa, DV Kolekar and Mallikarjun B Hanji), ICAR Agricultural Technology Application and Research Institute, Zone XI, Bengaluru, India, pp208.

Thimmappa K, Sagar S Pujar, Shivani Dechamma, D.V., Kolekar, B.T., Rayudu, M.B., Hanji and Yamuna N (2022) India@75: Azadi Ka Amrit Mahotsav Programs, ICAR-Agricultural Technology Application Research Institute, Bengaluru, Karnataka, India.

D V Kolekar, B T Rayudu, Thimmappa K, Chandre Gowda M.J, Reddy, D.V.S., and M.B. Hanji (2022), Technology Inventory from ICAR institutes for Krishi Vigyan Kendras, ICAR-Agricultural Technology Application Research Institute, Bengaluru, Karnataka, India: Pp 380.

B. T. Rayudu, D. Harshitha, Akshatha M.K, D. V., Kolekar, Thimmappa K, M. J., Chandre Gowda' D. V., Srinivasa Reddy, M. B., Hanji and L.G., Hiregoudar (2022), One District One Product-Karnataka, Kerala and Lakshadweep: A strategic document by KVKs, ICAR-Agricultural Technology Application Research Institute, Bengaluru, Karnataka, India: Pp 220.

M.B. Hanji, B. T. Rayudu, D. V. Kolekar, Thimmappa K, M. J. Chandre Gowda' D. V. Srinivasa Reddy, Raju G Teggelli, Jyothi S. Kamathane, Bini Sam and Bindu Podikunju (2022), Achieving Food, Nutrition and Livelihood Security by KVKs of

Karnataka, Kerala and Lakshadweep, ICAR-Agricultural Technology Application Research Institute, Bengaluru, Karnataka, India: Pp 96.

5.3 Publications by KVKs

KVK staff of Karnataka published 121 research papers, 79 technical reports, 45 technical bulletins, 246 popular articles and 233 extension literature, and Kerala published 70 research papers, 14 technical reports, 11 technical bulletins, 60 popular articles and 72 extension literature on various technological aspects of agriculture and its allied enterprise.

5.3.1 Research Papers by KVKs

Anankumar, V., Hugar, P. S. and Hiremath, S. M., (2022), Seasonal incidence of Tea Mosquito bug, *Helopeltis Spp.* in guava, Cv.L-49 at MARS, Dharwad, Karnataka, *Biological Forum – An International Journal*, 14(1) : 1262-1268.

Aparna, V. S, Raji, P., Sumiya, K. V., Palathingal, V. F.,(2023), Phenotypic and genotypic assessment of rice germplasm for bacterial blight resistance, *Res. J. Agril Sci.*, 14(1): 01-07.

Arunkumar, K., Manju, J.V., Sudhakar, S., Marimuthu, R., Preethu, K. P., Ashiba, A. and Abishek, R., (2022), Foliar application of calcium and boron on yield and quality attributes of strawberry, *The Pharma Innovation Journal*, 11(4): 2054-2057.

Aliya Naz, Bhat, S. N., Balanagoudar, S. R., Veeresh, H. and Satyanarayana, R., (2023), Effect of humic acid on growth, yield and yield attributes of Rabi sorghum (*Sorghum bicolor L.*), *The Pharma Innovation J.*, 12(1): 2374-2377.

Archana, B. M., Govindappa, M. R., Yenjerappa, S. T., Aswathanarayana, D. S., Girish, G., (2022), Bioefficacy of bioagents and fungicides against *Macrophomina phaseolina (Tassi) Goid.* causing charcoal rot disease in sorghum crop, *Environment and Ecology*, 40 (3A): 1223—1228.

Arun Jiddannavar, Mahadev B. Gundakalle, and Hiremath, S. S., (2022), Development and evaluation of Karaveera and Dhatura biopesticide on spodopteralitura –a field study, *International journal of phytology Research*, 2 (3): 06-10.

Badari Prasad P. R., Raghavendra Yaligar, Sujay Hurali, Mansoor, Suhasini and Hanumanthappa Shrihari, (2022), Evaluation of Bioefficacy of Metaldehyde 2.5% Dry Pellet against Snails in Cabbage and its Phytotoxicity, *Biological Forum – An International Journal*, 14(1): 936-940.

Basavaraj, K., Sreenivas, A. G., Badari Prasad, P. R. and Rachana, R. R., (2022), First report of invasive thrips, *Thripsparvispinus(karny)* (Thysanoptera :Thripidae) infesting chilli, capsicum annuum in kalaburagi, karnataka, india, *J. Exp. Zool. India*, 25(1):191-194.

Basavaraj, K., Vikram Simha, H. V., Palaiah, P., Manjunath, N., Shruthi, N. and Bellad, S. B., (2022), Integrated Crop Management Practices Resulted in Higher Yield in Sorghum (*Sorghum bicolor L.*), *J. Krishi Vigyan*, 11 (1): 211-216.

Basila, Y., Anitha, S., Menon, M. V., Sreelakshmi, K. and Beena, V. I., (2021), In situ green manuring and herbicide on weed biomass, productivity and profitability of upland rice, *Indian J. Weed Sci.*, 53(1):1-6.

Bini Sam, (2022), Ergonomic Evaluation of Brush Cutters for Women users, *Journal of Krishi Vigyan Kendra*, 10(2), 131-136.

Charla, R., Patil, P. P., Bhatkande, A. A., Khode, N. R., Balaganur, V., Hegde, H. V., Harish, D. R., Roy, S., (2022), In Vitro and In Vivo Inhibitory Activities of Selected Traditional Medicinal Plants against Toxin-Induced Cyto- and Entero- Toxicities in Cholera, *Toxins*, 14(10):649.

Chethan, M. S., Chittapur, B. M., Halepyati, A. S., Basavanneppa, M. A. and Pralhad, (2022), Effect of levels of major and micronutrients on yield and economics of hybrid napier, *International journal of chemical studies*, 10(4): 34-38.

- Chikkanna, G. S., Shashidhar, K. R., Jyothi Kattogoduar, and Ambika, D. S., (2022), Low cost ripening chamber is boon to small and marginal farmers for ripening of mangoes, *The Pharma Innovation Journal*, Sp-11(9).
- Chithra, G. and Binu John Sam, (2022), Effect of Low Pressure Gravity Fed Drip Irrigation System on the Yield and Water Use of Cowpea for Homestead Farming for Sustainable Vegetable Production, *International Journal of Agricultural Sciences*,14(10):11738-11741.
- Chithra, G. and Binu John Sam, (2022), Friends of coconut tree –Coconut Consultants, *Indian Coconut Journal*, 61(13): 10-12.
- Dagar, J. C., Tomar, O. S., Minhas, P. S. and Kumar, M., (2013), Lemon grass productivity as affected by salinity of irrigation water, planting methods and fertilizer doses on a calcareous soil in a semi-arid region of northwest India, *Indian Journal of Agricultural Sciences*, 83(7): 734-738.
- Deepa James, C. F., Gleena Mary and Sally K. Mathew, (2022), Evaluation of Culture Filtrates of Endophytic Microorganisms from Tomato against *Ralstonia solanacearum*, *International Journal of Environment and Climate Change*,12(12):476-1481.
- Dinesh Kumar, S. P., Sudha, S. and Kammar, M. R., (2022), Performance of Cowpea Variety DC-15 at Farmers' Field, *J Krishi Vigyan*,10(2): 263-267.
- Ganesh, B. H., Sahu, M. L., Mahesh, N. B. L. and Venkatesh, L., (2022), Assessment water productivity under different pruning intensities in dalbergiasissoo: wheat based agri-silviculture system, *The Pharma Innovation Journal*, 11(7): 2668-2672.
- Gilsha Bai, E. B. Rema, K.P., Sajeena, S. and Sasikala, D. (2022), Simulation of groundwater flow using visual MODFLOW: A case study for the command area of Chalakudy river diversion scheme, *Indian J. Soil Conserv*, 50 (1): 29-37.
- Gururaj Basavaraj Bagalakot, Chaitanya, H. S., Kantharaj, Y., Shivakumar, B. S. and Jayaprakash, S. M., (2022), The Effect of Banana Cultivar and Maturity Stage on Flour Production, *Biological Forum – An International Journal*, 14(4a): 115-119.
- Hanumantha, M., Gunaga, R.P. and Patil, R. S., (2022), Tree to tree variation in reproductivity phenology in Indian Sandal wood (*Santalum album* Linn). *International Journal of farm Sciences*, 12(4):1-4.
- Hemalatha, K.J., Kattimani, K. N., Kurubar, A. R., Ramesh, G., Umesh, M. R. and Amaregouda, (2022), Standardization of nitrogen levels and harvesting stages to enhance the growth , yield and quality in ashwagandha (*Withaniasomnifera*) in north eastern dry zone of Karnataka,*The Pharma Innovation Journal*, 11(7):1272-1276.
- JagadishNaik, B.K., Ramesh, and Shilpa, H., (2022), Impact of ICT tools in dissemination of Agromet Advisory Services (AAS) among farmers in Ballari district, Karnataka, *IJCMAS*,2(3):17-21.
- Jag jiwan Ram, Sridhar, J. N., andPralhad, Effect of cotton seed cake and its effect on milk yield and its composition in HF-Deoni crossbred cows, *The PharmaInnovation Journal*, 11(12): 4945-4948.
- Jakir Hussain, K. N.,Jagadeesh,B. R.,Rajkumar,G. R. and Santhosh,H. M.,(2022), Groundwater quality characterization in northern parts of Ranebennur taluk, Haveri district, Karnataka, *India. J. Exp. Zool. India*,25(2): 1857-1869.
- Jayababu S, Preethu, K. P., and Marimuthu, R., (2022), Comparative Assessment of Fat and SNF Contents of Milk of Jersey and Holstein Friesian Cattle, *Journal of Agriculture and Veterinary Science*, 16(1): 39-44.
- Jayaprakash, S. M., Faijalahmadmulla, Thippeshappa, G. N., Pruthvi Raj, H. M., Chaitanya, H. S., Naveen, N. E. and Lakshman, (2022), Distribution of forms of iron in soils under Arecanut based cropping systems in the coastal regions of Udupi district, *The Pharma Innovation Journal*, 11(12): 4776-4780.

- Khaja Mohinuddin, D., Girish, G., Ashok, M. B., Suvarna, Yogeesh, L.N., Govindappa, M. R., Anand Kumar, V. and Ravi Kumar, A., (2022), Screening of Shoot Fly Resistance in M5 Generation of Sorghum (*Sorghum bicolor* (L.) Moench), *Biological Forum – An International Journal*, 14(4): 47-54.
- Krupashree, R., Satyanarayana Rao, Desai, B. K., Ananda, N. and Bhat, S. N., (2022), Zinc and Iron fortification through enriched organics and foliarnutrition on growth, yield and economics of foxtail millet (*Setaria italica*), *Environment Conservation J.*, 23(3):62-70.
- Lekha, M., Faizal, M. H., Poornimayadav, P. I. and Saroj, K. V., (2022), Safety evaluation of Cashew nut shell liquid formulations, *The Pharma Innovation journal*, 11(11) 1893-1897.
- Mahesh Kadagi, Santhosh S., Santhosh H. M., Ashok P. and Jayashree P., (2022), Effect of double dose PGF-2 α on conception rate in repeat breeding dairy animals under field condition, *Journal of Krishi Vigyan*, 11 (SI): 26-29.
- Manju, J. V., Preethu, K. P., Ashiba, A. and Marimuthu, R., (2022), Evaluation of different microbes in ensuring climate resilient agriculture for production of healthy planting material in Black Pepper, *Journal of Agriculture and Veterinary Science*, 15(2): 18-20.
- Manjunatha, N., Halepyati, A. S., Vasudev Naik, P., Chittapur, B. M. and Narayana rao, K., (2022), Effect of irrigation levels, nipping and foliar spray of nutrients along with growth regulators on Yield parameter and Economics of transplanted pigeonpea (*Cajanuscajan*(L.) Millsp.), *Int. J. Plant and soil Sci.*,34(23): 1271-1285.
- Mini Joseph, Reshmi, R. and Anu Joseph, (2022), Dietary Modifications During the Covid-19 Pandemic - A Multi Centric Study from Kerala, *J. Res. in Food Sci. and Nutr.*, 9(1): 42-50.
- Mouneshwari R.Kammar, Arjun R. Sulagitti and Sudha, S. (2022), Performance of biopesticides for management of white grub *Holotrichiaserrata* in sugarcane, *The Pharma Innovation Journal*, 11(11): 2152-2154.
- Mubeena, P., Usha C. Thomas and Deepa Surendran, (2022), Studies on anti-nutritional factors and micro nutrient content of locally available tree fodders and shrubs in Southern Kerala, *Forage Research*, 48(2): 232-235.
- Ningaraj Karadguddi, D. V., Shanwad, U. K., Rajkumara, S., and Punitha, B. C., (2022), productivity enhancement in drip irrigated chilli (*Capsicum Annum L.*) Through inorganic fertilizers nutrient management, *Journal of Farm Sciences*, 35(2): 199-203.
- Naveen, (2022), GIS Based Fertility Capability Classification of Nagenahalli Micro-watershed for Land Resource Management, *Progressive Research : An International Journal*, 16: 296-300.
- Neelkant, D., Dilipkumar, Manjunath Patil, B., Bhagvantappa, Venkatgiri and Pallavi, (2022) Hematobiochemical and hemodynamic changes in induction agents in drip form using guaifenesin and ketamine with or without dexmedetomidine under isoflurane anaesthesia for various surgeries in cattle, *Journal of Experimental Zoology, India*, 25(1):1147-1155.
- Nivvethapriya, G., Shivakumar, B. S., Nagaraja, M. S., Chaitanya, H. S. and Ganapathi, M., (2022), Management of Secondary Nutrients in Acid Soils and its Effect on Quality of Banana cv. Ney Poovan, *Biological Forum – An International Journal*, 14(4): 789-793.
- Ojus, S., Dilipkumar, D., Bhagavantappa, B., Vijay Kumar, M., Sandeep Halmandge, ManjunathPatil and Venkatgiri, (2022), Physiological and biochemical analysis of dogs undergoing femoral fracture repair using advanced locking plate system II and locking compression plate, *The Pharma Innovation Journal*, 11(1): 1137-1141.
- Pallavi, Dilipkumar, D., Manjunath Patil, Bhagavantappa, B. and Venkatgiri, (2022), Tibiotarsus Fracture Repair by Using Titanium and Stainless Steel Locking Reconstruction Bone Plates in Backyard Poultry, *Journal of Experimental Zoology, India*, 25(1): 273-277.

- Patil, S. B., Gangappa Nayak, Poornima, Kalavathi Kambali, M. H., and Poornima Matti, (2022), Management of pink bollworm using behaviour-modifying chemical (SPLAT Pheromone) in Bt. Cotton. *Journal of Experimental Zoology, India*, 25(1): 781-787.
- Pema, K. G., Nagabovanalli, B. P., Prabhudev, D., Shruthi and Yogesh, G. S., (2022), Application of Slag Based Gypsum in Rice Crop and Its Effect on Growth, Yield and Nutrient Availability in Acidic, Neutral and Alkaline Soils, *Communications in Soil Science and Plant Analysis*, 1-15.
- Prathviraj, Shant Kumar, V. S., Ranganath, G. J., Chandrashekara, N., Raghunath, B. V. and Ramesh, D., (2022), Incidence of classical swine fever in local domestic pigs of Bidar district of Northern Karnataka, *The Pharma Innovation Journal*, 11(10): 2154-2156.
- Prema, B., Patil, Sangeeta Jadhav and Shubha. S., (2022), Empowerment of rural women in backyard poultry farming with improved breeds, *The Pharma Innovation J.*, 11(3): 662-663.
- Prema, B., Patil, Vivek S. Devaranavadi and Shubha, S., (2022), Evaluation of solar nipping tool in enhancing the efficiency and yield of Chickpea, *The Pharma Innovation J.*, 11(5): 2515-2517.
- Raghuraja, J. and Devaraja, T.N., (2022), Increased income to farming community through direct marketing, *Asian Journal of Extension, Economics and Sociology*, 40 (9): 146-150.
- Raghavendra Yaligar, Badari Prasad, P. R., Hanumanthappa Shrihari, Mansoor, Sujay Hurali, Jyothi, R. and Suhasini, (2022), Evaluation of Bio-Efficacy and Phytotoxicity of Flubendiamide 90 + Deltamethrin 60-150 SC (15% W/V) against Pest Complex in Cucumber, *Biological Forum – An International Journal*, 14(1): 883-889.
- Rajeev, M. S. and Muralidharan, P., (2022), Effect of high yielding variety and improved practices on yield of sesamum in Onattukara tracts of Alappuzha district, *J. Krishi Vigyan*, 10(2):94-97.
- Ranganath, G. J., Prathviraj, Chandrashekara, N., Harish, D. K. and Ramesh, D., (2022), Assessment of reproductive failure due to repeat breeding and anestrous in dairy animals of UttaraKannada district of Karnataka, *The Pharma Innovation Journal*, 11(10): 1351-1355.
- Rashmi, K. M., Ranganath, G. J., Satheesha, K. B., Roopa Devi, Y. S. and Ramesh, D., (2022), Role of Betaine in ruminants, *The Pharma Innovation Journal*, 12(2): 387-391.
- Ravikumar, A., Anand Kumar, V., Basavaraj, K., (2022), Field Bio-Efficacy of Chlorpyrifos 50% + Cypermethrin 5% EC against Fall Armyworm, stem borer and on Natural enemy Maize during 2020-21 Kharif season, *Environment and Ecology*, 40 (2A) : 554-559.
- Ravikumar, A., Basavaraj, K., Anand Kumar, V., (2022), Evaluation of cypermethrin 10% + Indoxacarb 10% SC against fall armyworm, *Spodoptera frugiperda* and stem borer in Maize, *J. Exp. Zool. India*, 25 (1):259-265.
- Ravikumar, K., Anandkumar, V. and Basavaraj, K., (2022), Field bio-efficacy of chlorpyrifos 50% + Cypermethrin 5% EC against Fall army worm, stem borer and on natural enemies in maize during 2020-21 kharif season, *Environment and Ecology*, 40 (2A) : 554-559.
- Ravi. S., Muralidharan, P. and Arathy, J., (2022), Impact of adoption of climate resilient practices in goat farming in Kuttanad region of Kerala, *J. Krishi Vigyan*, 10(2):198-203.
- Resmi, J., Bindu, M. R. and Suja, G., (2022), *In vitro* Multiplication of *Kaempferia galanga* L.- An Important Medicinal Plant, *J. Krishi Vigyan*, 11(1): 223-228.
- Rhea Marie Gracias, Dilipkumar, D., Bhagavantappa, B., Vivek R. Kasaralikal, Prashantkumar Waghe, Manjunath Patil and Venkatgiri, (2022), Evaluation of tibial fracture healing by estimation of biochemical and physiological parameters in dogs, *The Pharma Innovation Journal*, 11(2): 1654-1657.

- Rhea Marie Gracias, Dilipkumar, D., Bhagavantappa, B., Vivek R. Kasaraliker, Prashantkumar Waghe, Venkatgiri and Manjunath Patil, (2022), Evaluation of glycopyrrolate, fentanyl citrate, triflupromazine hydrochloride, midazolam and ketamine hydrochloride induction with isoflurane maintenance for the repair of tibial fractures in dogs, *The Pharma Innovation Journal*, 11(2): 1740-1743.
- Rudramuni, T., Thippaiah, M., Onkarappa, S. and Ganiger, P., (2022), Influence of groundnut based intercropping system on major sucking insect pests in groundnut, *Arachis hypogea* Linnaeus, *J. Exp. Zool. India*, 25(2):1757-1760.
- Rudramuni, T., Thippaiah, M., Onkarappa S. and Ganiger, P., (2022), Screening and bio chemical analysis of groundnut genotypes against thrips, *Scirtothrips dorsalis* Hood, *J. Exp. Zool. India* 25(2):1761-1769.
- Shala K. Kamble, Prasanna Kumar, B. H., Nooli, S. S. and Manjunatha Hebbara, (2022), Assessing optimum spacing, sowing method and nutrient requirement for Chia (*Salvia hispanica* L.), *Journal of Farm Sciences*, 35(2): 204-208.
- Shant Kumar, V. S., Prathviraj, Ranganath, G. J., Chandrashekar, N., Raghunath, B. V. and Ramesh, D., (2022), Incidence of acute ruminal acidosis in Kenguri sheep of Bidar district of Northern Karnataka, *The Pharma Innovation Journal*, 11(10): 808-810.
- Shashidhar, K. R., Chikkanna, G. S., Noorulla Haveri, Thulasiram, K. and Umesh Naik, (2022), Studies on suitable intercrops under tree mulberry for additional income in kolar district of Karnataka, *The pharma Innovation Journal*, 11(10):587-590.
- Sheela Rani, S., Sudhir, K., Nalina, C. N., Prakasha, H. C., Chandrakala, M., Veeranagappa, P. and Shankara, M. H., (2022), Maize (*Zea mays*) Yield Response to Application of Calcium, Magnesium and Boron on Acid Soil, *International Journal of Environment and Climate Change*, 12(11): 2980-2988.
- Shinde, S., Mahesh, K. and Venkanna, B., (2022), Evaluation of Surf Field Test and California Mastitis Test for Diagnosis of Sub Clinical Mastitis in Crossbred Cows, *J. Krishi Vigyan*, 11 (SI) : 37-42.
- Shivashenkaramurthy, M., Manju, M. J., Roopa S. Patil, Annapurna Neeralagi and Siddappa S. Kannur, (2021), Assesment of Paddy variety uplied situation of Uttara Kannada District, *The Pharma Innovation Journal*, 10(12):988-992.
- Shivashenkaramurthy, M., Nayak, G. V., Channabasappa, K. S., Shanjaya B. Patil and Rajakumar, G. R., (2021), Effect of nutrient management and cultivars on sugarcane yield and economics, *Journal of Pharmacognosy and Phytochemistry*, 10(2):157-161.
- Shivashenkaramurthy, M., Nayak, G. V., Channabasappa, K. S., Shanjaya B. Patil and Rajakumar, G. R., (2021), Effect of nutrient management and cultivars on quality of sugarcane juice and liquid Jaggery, *Journal of Pharmacognosy and Phytochemistry*, 10(2):1502-1510.
- Shivashenkaramurthy, M., Shanjaya B. Patil, Nayak, G. V., Rajakumar, G. R. and Channabasappa, K. S., (2022), Effect of cultivars and organic nutrient management on yield of Sugarcane and liquid jaggery (Joni Bella) in Uttar Kannada district of Karnataka, *The Pharma Innovation Journal*, 11(9): 1297-1307.
- Shridhar, N. B., Vinay P. Tikare, Santhosh Kumar, C. N., Mahesh Kadagi, Sunilchandra, U. and Anurag Borthukar, (2022), Buffalo Mammillitis: A Systematic Review, *Int. J. Curr. Microbiol. App. Sci* 11(05): 267-277.
- Smijisha, A. S., Darsana, S., Gilsha Bai, E. B., Sumiya, K. V. and Reshmi R., 2022, Improved Performance of Malabari Goat Kids Supplemented with Kid Starter at the Early Stages of Life, *J. Krishi Vigyan*, 11 (SI): 63-67.
- Sudhakar, S., Preethu, K. P and Marimuthu, R., (2022), Entomo Pathogenic Nematodes, a boon in small cardamom root grub management: special

emphasis to Idukki district, *Journal of Research in Agriculture and Animal Science*, 9(2): 15-19.

Sudhakar S., Marimuthu, R., Arunkumar, K., Dhanaphal, K., Venkatesan, T. and Sivakumar, G. (2022), Pink pigmented facultative methylotrophic bacteria (PPFMs) as microbial farmers in small cardamom plantation, *The Pharma Innovation Journal*, 11(4): 607-610.

Suja, G., Harishma, S. J., Byju, G., Neeraja, C. R. and Sheeba, B. S., (2021), Geo-tagged characterization of organic growers in Kerala, *Indian Journal of Agronomy*, 66(3): 272-278.

Sunil, C. M., Chandrakala, H. and Yogesh, G. S., (2022), Performance of Multicut Fodder Sorghum Under Rainfed Conditions of Chamarajanagar District, Karnataka., *Indian Res. J. Ext. Edu.* 22 (3).

Ullikashi, K. Y., Kulkarni, U. N., Matt, K. K., Pushpa Bharathi and Sankangoudar, S. K., (2022), Assessment of drinking water quality in mining affected Hospet and Sandur Talukas of Ballari district, *The Pharma. Innov. J*, 11(7):2043-2046.

Vani Chandran and Bindu Podikunju, (2021), Constraints Experienced by Homestead Vegetable Growers in Kollam District, *Indian Journal of Extension Education*, 57(1):32-37.

Veerendra Kumar, K.V. and Saju George, (2021), Management of Yellowing and spike shedding in Black Pepper at Kodagu District of Karnataka, *Journal of Krishi Vigyan*, 10(1): 164-167.

Vidyavati S. Hakke, Ananda, N. B., Chittapur, M., Umesh, M. R. and Bhat S. N. (2022), Effect of pre and post emergent application of herbicides on weed control efficiency, performance of sunflower (*Helianthus annuus L.*) and succeeding chickpea (*Cicer arietinum L.*) *J. Farm Sci.*, 35(2): 149.

Vikram Simha, H. V., Basavaraj, K., Manjunath, N., Shruti, N. and Bellad, S. B., (2022), Utility of Tractor operated mobile shredder for Cotton residue management, *J Krishi Vigyan*, 11(1):381-385.

Yogesh, G. S., Prakash, S. S. and Thimmegowda, M. N., (2022), Effect of Micronutrients Application under Different Fertilizer Prescription Methods on Growth and Yield of BT Cotton, *International Journal of Plant & Soil Science*, 34(20): 558-564.

Yogesh, G. S., Prakash, S. S. and Thimmegowda, M. N., (2022), Effect of Micronutrients Application under Different Fertilizer Prescription Methods on Post-harvest Nutrient Status of Soil, Yield and Economics of B_T Cotton, *The Mysore journal of Agricultural Sciences*, 56(3):298-305.



Chapter - 6

Human Resource Development

The ICAR-ATARI Zone XI is undertaking human resource development besides KVKs coordinating and monitoring.



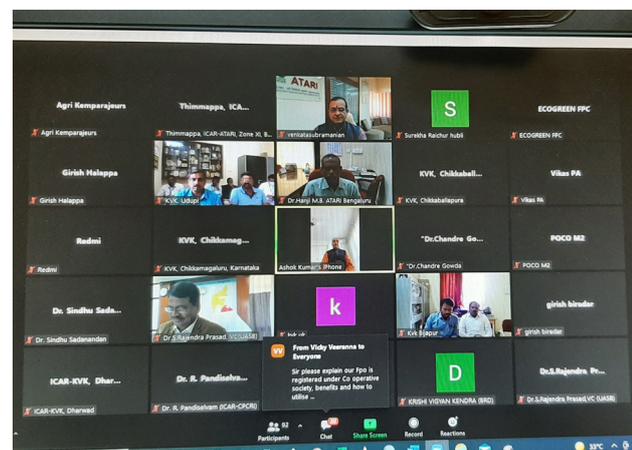
6.1 Capacity Development program on Technology Backstopping to Karnataka FPOs

One day workshop on “Technology Backstopping to Karnataka FPOs” was organized by ICAR-ATARI, Zone XI in collaboration with University of Agricultural Sciences, Bengaluru through on-line mode on February 11, 2022. Dr. V. Venkatasubramanian, Director, ICAR-ATARI, Zone XI welcomed dignitaries and participants present in the workshop. During the session, Mr. Subbaya, Chairman, Puthari Farmer Producer Company Limited, Kodagu, Mr. Satyanarayana Udupa, C&MD, Udupi Kalparasa Coconut and All Spices Producer Company Limited, Udupi and Mrs. Allwinn, Tulunadu Ecogreen Farmers Producer Company Limited, Kasaragod shared their FPO success and achievements. Dr. Rajendra Prasad, Vice Chancellor, University of Agricultural Sciences, Bengaluru was the Guest of Honour. He suggested that each KVK need to adopt one FPO to transfer available technologies. He advised the KVKs to act as a knowledge partner and provide all technology inputs starting from production till processing and export linkages to market their products. He suggested to KVKs to explore the possibilities of linking FPOs to MSME and Atma Nirbar Bharat programs.

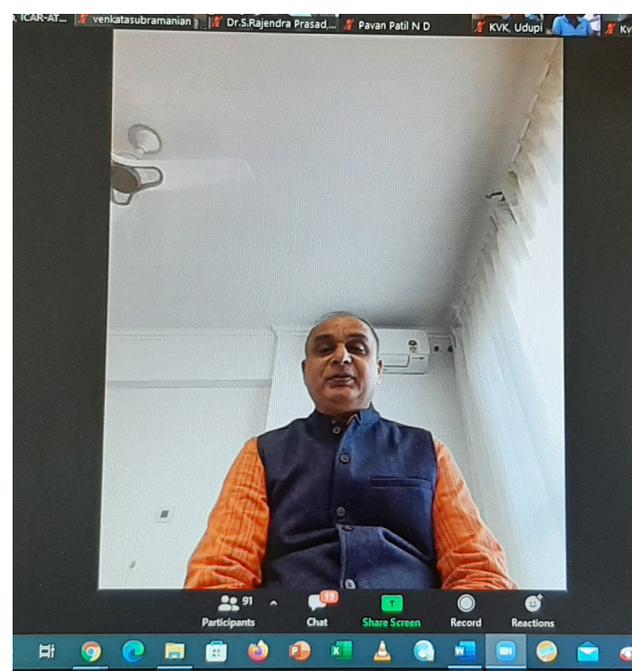
Dr. A. K. Singh, Deputy Director General (Agricultural Extension), ICAR, New Delhi was the Chief Guest. He highlighted the Prime Minister’s ambitious programme of forming 10000 FPOs across the country. He informed that KVKs are also involved in formation and handholding of FPOs. He said that whichever FPOs comes into contact with any ICAR institutes, Agricultural Universities and KVKs, they should be provided with all kinds of handholding in terms of technology support. Those KVKs who have not directly involved in the formation of FPOs may support existing FPOs in their district and support them by providing advice and linking with other agencies. He appreciated three FPOs for sharing their success in the workshop. He suggested that those FPOs have taken one product may diversify into two or more products to run FPOs profitably

throughout the year based on seasonality and availability of raw materials.

In Session II of the workshop, five different product-based technology lectures viz, technology for coconut-based products from ICAR-CPCRI, Kasaragod, technology for horticulture-based products from ICAR-IIHR, Bengaluru, technology for millet-based products from ICAR-IIMR, Hyderabad, technology for fish-based products from ICAR-CIFT, Cochin and technology for animal-based products from SRS, ICAR-NDRI, Bengaluru were organized. FPO members and KVK Scientists have participated in the workshop.



A view of participants in the program



Chief Guest Address by Dr. A. K. Singh, DDG (Ag Extension), ICAR, New Delhi

Chapter - 7

Workshops, Meetings and Conferences

Director/scientists/officers of the institute were conducted/ participated in workshops/ meetings/ conferences as well as human resources development.



Director/scientists/officers of the institute conducted/participated in the following meetings/workshops/ conferences/ seminars/ capacity development programmes held during reporting period:

Dr. V. Venkatasubramanian, Director

- Felicitated Padma Shri award winner Amai Mahalinga Naik at KVK Dakshina Kannada on 31 January 2022.
- Attended the meeting of signing MoU on Soybean Seed Production at JNMC Belagavi. The MoU was signed between Chairman, KLE KVK, Belagavi; Director, ICAR-IISR, Indore and Deputy Commissioner, DoAFW for Soybean Seed Production of Breeder Seed, Foundation Seed and Certified Seed of soybean on 12 February 2022.
- Participated in an interaction meeting with the participants of workshop on Soybean Seed Production at KVK Belagavi II on 13 February 2022
- Attended the inauguration of Capacity Development Programme on mango under PMFME at KVK Dharwad on 14 February 2022.
- Delivered virtually the valedictory address of ICAR sponsored Winter School on “Advances in Social Science Research and Evaluation” on 14 Feb 2022 on “Translation of Social Research output into application & practice”
- Inaugurated the Horticultural Seed Production Skill Training Programme at KVK Chamara-janagar on 15 February 2022
- Chaired the Local Programme Advisory Committee (LPAC) – III Review Meeting of the DST funded project ‘Mainstreaming Gender and Empowerment through women friendly farm mechanization package in tribal areas of Tamil Nadu’ at Erode on 15 February 2022.
- As Chairman of Monitoring and Management Committee for the DST Project, visited fields

in Tamil Nadu (Thalawadi, Erode) area under the project. Attended the wrap up meeting cum preparation and finalized the proceedings on 16 February 2022

- Attended the presentation on the topic ARMS in ICT Unit ICAR, Krishi Bhawan New Delhi on February 8, 2022.
- Attended the virtual meeting with Advisor to Hon’ble Administrator, U.T. of Lakshadweep regarding capturing the natural wealth of coconut in Lakshadweep islands which is also the prime focus of Government of India under ODOP/PMFME on 24 February 2022
- Organized the Soybean & Sugarcane Farmers Industry-Scientist Interface Meeting at KVK Belagavi II on 14.3.2022.
- Attended foundation stone laying for Seed Processing Unit cum Godown by Sri B.C. Patil, Hon’ble Minister of Agriculture, Govt. of Karnataka in the presence of Dr.Prabhakar B. Kore, Chairman, KLE Society, Belagavi on 14 March 2022.
- Delivered opening remarks in the Local Programme Advisory Committee (LPAC) – 3rd Review meeting at MYRADA KVK, Erode District which was organised by ICAR - Central Institute of Agricultural Engineering, RS, Coimbatore on February 15, 2022.
- Attended post budget webinar on “SMART Agriculture on Enhancing Oilseeds Production and promotion of millets” under the Chairpersonship of Ms. Shobha Karandlaje, Hon’ble MoS (Agriculture) and moderated by Dr T. Mohapatra, Secretary, DARE & DG, ICAR & Mr Rohit Kumar Singh, Secretary, Dept. of Consumer Affairs by National Food Security Mission (NFSM) Ministry of Agriculture & Farmers Welfare GoI on February 24, 2022.
- Chief Guest for the Discussion on Secondary Agriculture for Doubling of farmers Income organised by Agriculture Technology Centre, Bengaluru on 5 March, 2022.

- Virtually attended CEASI Governing Board Meeting on March 22, 2022
- Virtually attended SCISA 4.0 work plan meeting on March 23, 2022.
- Virtually attended rehearsal for 93rd AGM of ICAR on 26.03.2022
- Participated in Directors' Conference on 13 April 2022 at Delhi.
- Participated in the Farmer interaction meeting on 16 April 2022 at Kavaratti which was inaugurated by Secretary DARE and Director General, ICAR. Director General, ICAR.
- Participated in the training programme on 'Climate Smart Agriculture' held at D.Nagenahalli, Koratagere Taluk, Tumakuru on 19.04.2022 by KVK, Hirehalli, Tumkur.
- Organized action plan cum review meeting of KVKs under jurisdiction of Directorate of Extension of UAS Dharwad and Raichur at UAS Dharwad during 21 to 23 April 2022.
- Organized action plan cum review meeting of KVKs under jurisdiction of Directorate of Extension of KAU Thrissur at KAU Thrissur during 28 to 30 April 2022.
- Organized action plan cum review meeting of KVKs under jurisdiction of Directorate of Extension of UAS Bengaluru and Shivamogga at UAS Bengaluru during 4 to 6 May 2022.
- Conducted the Zonal Annual Review 2021-22 & Annual Action Plan 2022-23 Workshop for 16 KVKs of Karnataka (Dharwad, Haveri, Uttar Kannada, Bagalakote, Vijayapur-I, Vijayapur-II, Raichur, Bidar, Yadgir, Kalaburagi-I, Kalaburagi-II, Koppal, Ballari, Gadaga, Belagavi-I and Belagavi-II) during 21, 22 & 23 April 2022 at UAS, Dharwad.
- Organized Annual Review 2021-22 & Annual Action Plan 2022-23 Meeting for KVKs of Kerala and Lakshadweep during 28, 29 & 30 April 2022 at Thrissur. During the workshop, the progress of KVKs for the year 2021 was reviewed, and action plan of the KVKs for year 2022-23 was discussed and finalized through presentation of individual KVK before the experts from respective Agricultural Universities, ICAR Institutes and ICAR-ATARI, Bengaluru.
- Participated in XII Biennial National KVK Conference 2022 at Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Nauni in Solan district of Himachal Pradesh during 1-2 June 2022 on Sustainable Agricultural Production System. Arranged the Technical Session III: Success Interventions and Experiences of KVKs & Young Entrepreneurs as Co-convenor on June 02, 2022.
- Virtually delivered guest lecture on 'Strengthening of Agripreneurship for Empowering Rural Youth through Appropriate Technologies' on 5 June 2022 during the training programme on "Sugarcane Based Agripreneurship" organized by ICAR-SBI, Coimbatore and MANAGE, Hyderabad.
- Participated in the meeting to 'Review documentation of 75000 DFI cases and finalize the format of presentation' under the chairmanship of DDG (AE) on 07 May 2022 at CAEPHT, Sikkim
- Attended Executive Development Programme on Leadership Development in-person mode, from 9-5-2022 to 14-5-2022 at NAARM, Hyderabad
- Participated as Expert in the Pre-IRC meeting of Division of Social Sciences & Training, ICAR-IIHR, Bengaluru on 17 May 2022.
- Participated in the Financial Review Meeting at ASCI, Gurgaon on 6 June 2022.
- Delivered a speech 'About the programme implementation' during NICRA Phase II Launching cum Annual Review 2021-22 & Action Plan 2022-23 Workshop during 13-14 June 2022.

- Guest Speaker for the MANAGE collaborative training programme of ICAR-NRCB from 15-17 June 2022.
- Organized and participated in the KVKs Annual Zonal Workshop 2022 during 19-22 June 2022 at UAS, Dharwad.
- Attended the Foundation stone laying ceremony and farmers meet at KVK Belgaum II for farmers hostel and staff quarters on 19.6.22
- Delivered a lecture on ‘Translation of Social Research output input application and practice’ on 29.06.2022 during first Phase of training programme on “Management Development Programme for Newly Recruited Senior Scientists & Heads of Krishi Vigyan Kendras” during 15-29 June 2022 by NAARM Hyderabad and also delivered the Valedictory address as Chief Guest.
- Virtually attended 94th Foundation Day and Award Ceremony of ICAR on 15th July, 2022.
- Participated in the felicitation programme of award winning farmers. Felicitated Sh. Mohammed Ameerbabu K from Malappuram who bagged Jagjivan Ram Abhinav Kisan Puraskar/Jagjivan Ram Innovative Farmr Award 2021 and Smt.Sushomma, Entrepreneur from Malappuram, Kerala was honoured “Best Women Entrepreneur Award 2022” respectively on 23 July 2023 at KVK Kozhikode.
- Felicitated of Smt. Bindu Joseph for the Pandit Deen Dayal Upadhyay Anthodhay Krishi Puraskar 2022 at KVK Kozhikode on 27 July 2023.
- Organised and participated in stakeholders on 26 July 2022 at KVK Chikkamagalur.
- Virtually attended the meeting on implementation of Agri-Drone Project under the Chairmanship of Dr. A.K. Singh DDG(AE), ICAR on 12 August 2022
- Participated in the Review meeting attended by Sr. Scientist and Head of KVKs from Calicut, Malappuram, Pathanamthitta, Kollam and Kannur districts on 11 October 2022.
- Participated in the “Krishi Mahotsava 2022” at KVK Udupi on 22.10.22
- Attended virtual meeting of Accreditation & Certification Committee on 27th October 2022 (Agriculture Skill Council of India).
- Delivered the key note address and inaugurated the capacity development programme “Agripreneurship Promotion” at UAS, Dharwad on 2nd November 2022.
- Attended the ceremony of laying of foundation stone for farmers hostel at KVK Bellari by Sushri Shobha Karandlaje, Hon’ble Minister of State Agriculture & Farmers Welfare, Government of India on 14 November 2022.
- Attended Interactive program with Union Minister of state for Agriculture and Farmers Welfare, Sushri Shobha Karandlaje which was organised by ICAR-Taralabalu Krishi Vigyan Kendra, Davangere at Sirigere, Chitradurga district of Karnataka on 14 November 2022.
- Participated in the Technology week and KSCSTE Rural Innovators Meet (RIM)-2022 at ICAR-CPCRI Kasaragod and delivered inaugural address on 15.11.22. Visited Rural Innovators Meet and exhibition of innovators where around 45 agriculture and rural innovators across Kerala participated on 25 November 2023.
- Participated in the National Milk Day Celebration at KMF, Dairy Circle, Bengaluru which is the 101 Birth Anniversary of Dr. Varghese Kurien, the Father of White Revolution in India on 26 November 2022.
- Participated in the review meeting of KVK Lakshadweep by Sushri Shobha Karandlaje, Honourable Minister of State Agriculture & Farmers Welfare, Government of India during

her visit to KVK Lakshadweep on 2nd December 2022.

Dr. M. J. Chandre Gowda, Principal Scientist (Agricultural Extension)

- Scientific Advisory Committee Meeting, KVK Ballari, 03 January 2022
- Scientific Advisory Committee Meeting, KVK Kalaburgi-I, 05 January 2022
- Scientific Advisory Committee Meeting, KVK Kalaburgi-II, 05 January 2022
- Scientific Advisory Committee Meeting, KVK Bidar, 06 January 2022
- Scientific Advisory Committee Meeting, KVK Yadgir, 07 January 2022
- Nodal Officer Review Meeting, 13 January 2022
- DPC NIVEDI, 24 January 2022
- National Network Research Project on ARYA – Project team meeting 09 February 2022
- Academic Council Meeting, MANAGE, Hyderabad, 10 February 2022
- Scientific Advisory Committee Meeting, KVK Kannur, 15 February 2022
- Scientific Advisory Committee Meeting, KVK Thrissur, 17 February 2022
- Research Advisory Committee Meeting (RAC), 21-22 February 2022
- Refresher Training for KVKs under UAS Bengaluru at KVK B Rural, 3-4 March 2022
- Pre-Action Plan Meeting of KVKs under UAS Bengaluru at KVK Chamarajanagara, 16-18 March 2022
- Pre-Action Plan Meeting of KVKs under UAS Raichur, 4-5 April 2022
- National Dialogue on Innovations in Agricultural Extension, 8-9 April 2022, NASC, New Delhi.

- Action Plan Meeting of KVKs under UAS Raichur and UAS Dharwad, 21-23 April 2022
- DFI success story documentation and analysis meeting at Gangtok, Sikkim, 07-10 May 2022.
- Virtual Meeting on SREP preparation, MANAGE Hyderabad, 20 May 2022
- National Dialogue on Innovations in Horticultural Extension, 21 May 2022, IIHR Bengaluru.
- Extension Education Council Meeting, UAS Bengaluru, 25 May 2022
- National Workshop on ARYA, 05 July 2022
- Meeting with Central Silk Board, Bengaluru 12 July 2022
- Felicitation Meeting on National Best KVK Award at KVK Ramanagara, 22 July 2022
- National Network Research Project on ARYA – Project team meeting 26 July 2022
- Opportunities for Doubling Farmers Income - Krishi Mela, UAS Dharwad, 18 September 2022
- Capacity Development of Extension Professionals of KVKs in Zone IV, ATARI Patna 27-28 September 2022
- Scientific Advisory Committee Meeting, KVK Malappuram, 29 November 2022
- Scientific Advisory Committee Meeting, KVK Thrissur, 01 December 2022
- Scientific Advisory Committee Meeting, KVK Kannur, 14 December 2022

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

- Attended the Capacity Development programme on TDC under NICRA for the Phase-II KVKs during 13-14 August 2022 at CRIDA Hyderabad.

- Attended and Co-chair the technical session in the National Conference on Enhancing competitiveness of horticulture through Technology Innovations at CPCRI, Kasaragod on 18-11-2023.
- Attended the Orientation programme on IRM for the Dissemination of Pink Bollworm Management Strategies along with three KVKs of ATARI Bengaluru organized by the ICAR-CICR, Nagapur on 19 July 2023 in on-line mode.
- Attended the International conference on “Reimagining rainfed agro ecosystems” and also serve as convener of technical session on Climate resilient agriculture for risk management during 22-24 December 2022 at ICAR CRIDA Hyderabad, India.
- Coordinated the conduct of Annual review cum Action Plan 2022 for the KVKs of Kerala and Lakshadweep at KAU, Thrissur during 28-30th April 2022.
- Coordinated the conduct of Annual review cum Action plan 2022 for the 17 KVKs of Southern Karnataka at UAS, GKVK Bengaluru during 4-7 May 2022.
- Conducted orientation training and stakeholders meeting under Institute IFS project for two ACZs i.e North Eastern Transition zone and North Eastern Dry zones involving four KVKs, Progressive farmers and district development Department officials on 20 April 2022 at KVK Kalaburagi-I.
- Conducted Annual review cum Action plan 2022-23 workshop for the NICRA KVKs of Zone-XI, ATARI, Bengaluru during 13-14 June 2022.
- Conducted orientation training and stakeholders meeting under Institute IFS project for two ACZs i.e Northern Transition zone and Northern Dry zones on 22 July 2022 at KVK Gadag.
- Conducted orientation training and stakeholders meeting under Institute IFS project for four ACZs i.e Southern dry zone, Southern Transition zone, Hilly zone and Coastal zones involving 10 KVKs, Progressive farmers and Development Department officials at KVK Chikkamagaluru on 26 July 2022.
- Conducted orientation training and stakeholders meeting under Institute IFS project for two ACZs i.e Southern dry zone Eastern dry zones involving 10 KVKs, Progressive farmers and Development Department officials at KVK Mandya on 29 July 2022.
- Conducted the IRC meeting of ATARI, Bengaluru as Member Secretary on 26 December 2022 at ATARI, Bengaluru.
- Attended the SAC meeting of KVK Chitradurga on 20 January 2022 in virtual mode.
- Attended the selection committee meeting to select the SMS (Agro-met) for the KVK Bagalkote on 6 January 2022 in virtual mode.
- Attended the SAC meeting of KVK Kottayam on 14 February 2022 in virtual mode.
- Attended the SAC meeting and NICRA village selection at KVK Kannur on 15 February 2022.
- Attended the SAC meeting of KVK Kottayam on 25 February 2022.
- Attended the SAC meeting of KVK Kollam on 26 February 2022.
- Attended the Orientation programme to the KVK staff under UAS Bengaluru at KVK Bengaluru Rural district on 3 March 2022.
- Attended the SAC meeting of KVK Alpphuza on 4 March 2022.
- Attended the pre-action plan meeting to the KVKs of UAS Bengaluru during 16-17 March 2022 at KVK Chamarajanagar.

- Attended a meeting at Kavaratti, Lakshadweep Islands under the Chairmanship of Chief Secretary, Lakshadweep Islands on 12-04-2022 to finalize the road map for the development of Agriculture in Lakshadweep Islands.
 - Served as Chairman in the selection committee for the selection of SRF for the ICAR projects ARYA and Farmer FIRST on 28 May 2022 at ATARI, Bengaluru.
 - Attended the Interface meeting on enhancing the preparedness on agricultural contingencies with Department of Agriculture, Govt. of Karnataka and CRIDA Scientists on 1st August 2022 in virtual mode.
 - Attended Kissan Mela and Millets Festival jointly organized by KVK Bengaluru Rural District and Department of Agriculture, GOK in which around 800 farmers and farm women were gathered on 29 November 2023 at KVK campus of Bengaluru Rural District.
 - Attended midterm review of ICAR Regional Committee meeting of Zone 8 chaired by the DDG (fisheries) in virtual mode on 30 November 2022.
 - Attended the online presentation by the Secretary DARE and DG ICAR on Revitalizing ICAR-Activities, Aspirations and Actions on 11 November 2022.
 - Attended the Krishi and Horticulture Mela 2023 at KSUAHS, Shivamogga on 19 March 2023 and served as a judge for the selection of best exhibition stalls and also resource person for the topic on “IFS and its opportunities”.
 - Attended pre –action plan meeting as resource person for the KVKs of UAS Bengaluru during 28-29 March 2023 at GKVK Bengaluru.
 - Attended the SAC meeting of KVK Haveri on 31 October 2022 at KVK, Hanumanamatti.
 - Attended the SAC meeting of KVK Uttar Kannada on 4 November 2022 online.
- Dr.B.T.Rayudu, Principal Scientist (Agricultural Extension)**
- Live webcasting of PM Kisan Samman Nidhi Fund Release Programme held on 01 January, 2022.
 - SAC meeting of KVK, Raichur held on 08 January, 2022
 - SAC meeting of KVK, Pathanamthitta held on 22 January, 2022
 - SAC meeting of KVK, Chikkamagaluru held on 24 January, 2022
 - Special lecture in series of Azadi Ka Amrit Mahotsav on “Astro Medicine for Health and Happiness: Understanding the Truth and Absoluteness Beyond Matter” by Dr. Ramesh Rao Narayan, Cosmic Harmony, Bengaluru organized by ICAR-ATARI, Bengaluru on February 26, 2022.
 - Meeting of Petroleum Conservation Research Association (PCRA) organized by ICAR-ATARI, Bengaluru on February 16, 2022.
 - Research advisory committee meeting on Mid-term review of National network research projects of ICAR-ATARIs during February 21-22, 2022 organized by Agricultural Extension Division, ICAR, New Delhi.
 - SAC meeting of KVK, Thiruvananthapuram held on 08 March, 2022
 - SAC meeting of KVK, Idukki held on 11 April, 2022
 - Action Plan Meeting of KVKs under the jurisdiction of DEs of UAS, Dharwad and UAS Raichur to be held at UAS, Dharwad during 21-23 April, 2022.
 - Annual review cum Action Plan 2022 for the KVKs of Kerala and Lakshadweep held at KAU, Thrissur during 28-30 April, 2022.
 - On line meeting to review KVK KISAN KART Software development at KVK Pathanamthitta on 23 May, 2022.

- Review meeting of KVK Shivamogga held on 18 June, 2022
- Zonal Workshop of KVKs 2022 organized by ICAR-ATARI, Bengaluru at UAS, Dharwad during 19-22 June, 2022.
- Stakeholders meeting of IFS project for Northern dry zone and Northern transition zone to be held at KVK Gadag on 22 July, 2022.
- Stakeholders meeting of IFS project for Central dry zone, Southern transition zone, Hilly zone and Coastal zone to be held at KVK, Chikkamagaluru on 26 July, 2022
- Stakeholders meeting of IFS project for Eastern dry zone and Southern dry zone held at KVK, Mandya on 29 July, 2022
- Statistical and Socio economic methods and impact assessment for technology refinement in agriculture held at ICAR-CPCRI, Kasaragod on 11 August, 2022.
- Review meeting of KVK Idukki held during 17-19 October, 2022
- SAC meeting of KVK, Dharwad held on 29 October, 2022
- Meeting on guidelines for the preparation of KVK Award document to be held at KVK, Gadag during 03-04 November, 2022.
- Review meeting of KVKs Belagavi-I and II held during 09-11 November, 2022
- Interaction meeting of FPOs with Hon'ble Minister organized by KVK, Davanagere on 14 November, 2022
- Review meeting of KVK, Davanagere held on 15 November, 2022
- Review meeting of KVK, Chikkamagalur held on 16 November, 2022
- Online meeting on Natural Farming organized by Division of Agricultural Extension, ICAR, New Delhi on 13, December, 2022.

Dr. Thimmappa K., Principal Scientist (Agricultural Economics)

- Participated in the SAC meeting of KVK Koppal on January 04, 2022.
- Participated in the SAC meeting of KVK Ramanagara on January 11, 2022.
- Participated in the webinar on “Smart Agriculture and Budget Implementation” which was addressed by the Hon'ble Prime Minister and Hon'ble Agriculture Minister & organized by ICAR on February 24, 2022.
- Participated in special lecture on “Astro Medicine for Health and Happiness: Understanding the Truth and Absoluteness Beyond Matter” by Dr. Ramesh Rao Narayan, Cosmic Harmony, Bengaluru organized by ICAR-ATARI, Bengaluru on February 26, 2022.
- Participated in the FPO progress review meeting organized by NCDC on February 27, 2022.
- Participated in the meeting of Petroleum Conservation Research Association (PCRA) organized by ICAR-ATARI, Bengaluru on February 16, 2022.
- Participated in the KVK Kodagu Scientific Advisory Committee meeting on February 16, 2022.
- Participated in the Research advisory committee meeting on Mid-term review of National network research projects of ICAR-ATARIs during February 21-22, 2022 organized by Agricultural Extension Division, ICAR, New Delhi.
- Participated in the Azadi Ka Amrit Mahotsav Programs lecture series organized by ICAR given by Dr. R S Paroda, Former Secretary, DARE and Director General, ICAR organized by ICAR on April 21, 2022.
- Participated in the XII Biennial National KVK Conference-2022 held at Dr. YSPUH & F, Solan, Himachal Pradesh during June 01-02, 2022.

- Participated in the Central Silk Board meeting to discuss Mulberry cultivation and silk worm rearing project to be taken up by KVKs at CSB, Bengaluru on July 12, 2022.
- Participated in Zonal ARYA project meeting organized by ICAR-ATARI, Bengaluru on July 04, 2022.
- Participated in ARYA National Research Project Meeting organized by Division of Agricultural Extension, ICAR, New Delhi on July 05, 2022.
- Participated in the ICAR Foundation Day farmers Meeting organized by ICAR, New Delhi on July 16, 2022.
- Participated in the felicitation meeting on National Best KVK Award at KVK Ramanagara, July 22, 2022.
- Participated in the Zonal Workshop 2022 at UAS, Dharwad during July 19-22, 2022.
- Participated in the Azadi Ka Amrit Mahotsav Programs Lecture #74 on Science for the Society: Agricultural Imperatives by Dr. Trilochan Mohapatra, Former Secretary, DARE and Director General, ICAR organized by ICAR, New Delhi on August 12, 2022.
- Participated in the NITI Ayog's Technical workshop on Mapping and Exchange of Practices (MEGP) Initiative for Millets Main Streaming in Asian and African Countries through virtual mode organized by NITI Ayog, New Delhi on September 16, 2022.
- Participated in the Azadi ka Amruth Mahotsav lecture series given by DDG (Crop Science), ICAR, New Delhi through virtual mode on November 11, 2022.
- Participated in the ICAR- NBAIR TSP Programme 22-23 on "ensuring sustainable livelihood security of tribal in remote tribal villages of Adimaly block, Idukki District in Kerala on November 18, 2022.
- Participated in the Azadi ka Amruth Mahotsav lecture series given by DDG (Animal Science), ICAR, New Delhi through virtual mode November 18, 2023.
- Participated in the Azadi ka Amruth Mahotsav lecture series given by Dr. S.K. Chaudhari, DDG (NRM), ICAR, New Delhi through virtual mode December 02, 2022.
- Participated in the Azadi ka Amruth Mahotsav lecture series given by DDG (Horticulture), ICAR, New Delhi through virtual mode on December 05, 2022.
- Participated in the Drone Project progress meeting organized through virtual mode by DDG (AE), ICAR, New Delhi on December 09, 2022.
- Participated in the inaugural function of 'Value Addition and Entrepreneurship Development in Spices' capacity development program held at ICAR-IISR, Kozhikode, Kerala on December 13, 2022.
- Participated in the Certificate distribution function of 'Value Addition and Entrepreneurship Development in Spices' capacity development program held at ICAR-IISR, Kozhikode, Kerala on December 15, 2022.

Dr. D. V. Kolekar, Scientist (Agricultural Extension)

- Participated in PM Kisan Samman Nidhi Fund Release Programme on 01.01.2022.
- Attended SAC Meeting of KVK, Vijayapura-II on 1.1. 2022 (F/N).
- Attended SAC Meeting of KVK, Vijayapura-I on 1.1. 2022 (A/N).
- Attended SAC Meeting of KVK, Bagalkot on 4.1.2022.
- Attended SOC Meeting on 10.1.2022.
- Nodal Officer Review Meeting of KVKs on 13.01.2022.

- Attended google meet on 29.1.2022 to discuss 7th CPC arrears to KVKs.
- Attended SAC Meeting of KVK, Dakshin Kannada on 31.1.2022.
- Attended SAC Meeting of KVK, Wayanad on 8.2.2022.
- Attended online meeting to discuss PCRA and RE Budget for KVKs on 9.2.2022.
- Participated in the staff meeting Chaired by Director ATARI Bengaluru on 10.2.2022 at conference hall to deliberate on points to be discuss at the DDG (AE) meeting scheduled later.
- Participated in online workshop on Technology Backstopping to FPOs on February 11, 2022.
- Participated in online Seminar on Fodder Resources Development Plan for the state of Karnataka on 16th February 2022.
- Online Seminar on Fodder Resources Development Plan for the state of Karnataka organized by ICAR-IGFRI, RS, Dharwad on 16 February 2022
- Attended Azadi Ka Amrit Mahotsav special lecture on “Astro Medicine for Health and Happiness: Understanding the Truth and Absoluteness Beyond Matter”. Dr. Ramesh Rao Narayan, Cosmic Harmony, Bengaluru on February 26, 2022.
- Attended online webinar on Budget Implementation on 24.02.2022 which was addressed by Hon’ble Prime Minister and Hon’ble Agriculture Minister followed by 5 parallel sessions.
- Participated in RAC mid-term review meeting of the Eight Network National Projects of the Agricultural Extension Division on 21-22 February 2022.
- Attended Dry run of the Budget Webinar on 23rd February 2022.
- Attended meeting on 28.3.2022 to discuss status of Expenditure at KVKs and DEEs.
- Participated in the preparatory meeting on 11.4.2022 at KVK Lakshadweep and attended the meeting chaired by Advisor to Administrator of UT Lakshadweep at Secretariat Conference Hall on 12.4.2022.
- Associated in organization and coordination of action plan cum review meeting of KVKs under jurisdiction of Directorate of Extension of UAS Dharwad and Raichur at UAS Dharwad during 21 to 23 April 2022 and participated.
- Associated in organization and coordination of action plan cum review meeting of KVKs under jurisdiction of Directorate of Extension of KAU Thrissur at KAU Thrissur during 28 to 30 April 2022 and participated.
- Associated in organization and coordination of action plan cum review meeting of KVKs under jurisdiction of Directorate of Extension of UAS Bengaluru and Shivamogga at UAS Bengaluru during 4 to 6 May 2022 and participated.
- Participated in a meeting to finalize DFI cases of 75000 farmers under chairmanship of the DDG (Agricultural Extension) held during 07-09 May 2022 at College of Agricultural Engineering & Post Harvest Technology, Ranipool, Gangtok, Sikkim.
- Participated in a XII Biennial National Conference of KVKs-2022 during 1-2 June 2022 at Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Nauni in Solan district of Himachal Pradesh.
- Associated in organization and coordination of Zonal Workshop for the KVKs in Karnataka, Kerala and Lakshadweep at University of Agricultural Sciences, Dharwad during 19 to 22 June 2022 and participated during 21 to 22 June 2022.

- Coordinated the organization of Zonal Review cum Action Plan Workshop and ZPMC meeting of Farmer FIRST on 17th August, 2022.
- Attended the SAC meeting of KVK Vijayapura-I on 17.10.2022.
- Attended the SAC meeting of KVK Vijayapura-II on 18.10.2022.
- Attended the SAC meeting of KVK Bagalkot on 19.10.2022.
- Attended the SAC meeting of KVK Wayanad on 05.11.2022.
- Organized and coordinated the Celebration of Swachhta Pakhawada during December 16-31, 2022 at KVKs of zone XI and ATARI Bangalore.
- Participated in the SAC meeting of the KVK Davanagere on 11.01.2023.
- Participated in the SAC meeting of the KVK Bengaluru Rural on 30.01.2023.
- Participated in the SAC meeting of the KVK Dakshina Kannada on 10.02.2023.
- Participated in the SAC meeting of the KVK Mandya on 14.02.2023.
- Trainig Center, Gurukul, Kurukshetra during 5-6 December 2022.
- Attended the pre-action meeting conducted at UHS Bagalkot on 27.3.2023.
- Attended inaugural function of two weeks Capacity Development program for FPOs of Karnataka on 13.3.2023 at KVK Kodagu.
- Attended the Scientific Advisory Committee (SAC) meeting of KVK Belagavi – I on 24.11.2022.
- Attended the Scientific Advisory Committee (SAC) meeting of KVK Kodagu on 8.2.2023.
- Attended the Scientific Advisory Committee (SAC) meeting of KVK Ramanagara on 9.2.2023.
- Attended the Scientific Advisory Committee (SAC) meeting of KVK Belagavi – II on 14.2.2023.
- Attended the Scientific Advisory Committee (SAC) meeting of KVK Mysuru on 16.2.2023.
- Attended the Scientific Advisory Committee (SAC) meeting of KVK Kasaragod on 17.2.2023.
- Attended interface meeting of KVK scientists with scientists of IIHR, NRC Banana, IGFRI Dharwad, CPCRI Kasaragod and Officials of UT Administration Lakshadweep for transferring technologies at Lakshadweep during 11-12 April 2022.
- Attended on line meeting to review KVK KISAN KART Software development at KVK Pathanamthitta on 23.05.2022 by 3 PM.

Dr. Mallikarjun B. Hanji, Chief Technical Officer (Computer)

- Attended the Agri-startup conclave and Kisan Samman Nidhi at Mela grounds, IARI New Delhi during 17-18 October 2022.
- Resource person delivered lecture on Meta-Analysis at capacity development program “Statistical and Socio-economic methods and impact analysis for technology assessment and refinement” organized by CPCRI Kasaragod for KVKs on 12.8.2022.
- Attended the National Workshop on Natural Farming at RVSKVV Gwalior on 3.12.2022
- Attended the orientation cum training program Natural Farming at Natural Farming

Shri. J. Mathew, Administrative Officer (AO)

- Meeting for giving recommendations on administrative and financial guidelines for operation of KVKs (virtual) on 11.05.2022
- Meeting for giving recommendations on administrative and financial guidelines for operation of KVKs (virtual) on 10.06.2022

- Submission of revised SFC/EFC documents (virtual) on 09.06.2022
- EFC (physical) on 23.04.2022
- Ernakulam and Lakshadweep (virtual) on 29.04.2022
- SoC on 04.04.2022
- SoC on 18.05.2022
- Discuss Status of Soybean Project at KVK Belagavi II (virtual) on 23.06.2022
- Kisan Drone (virtual) on 05.07.2022
- LRMS (virtual) on 11.07.2022
- GeM chaired by Secretary ICAR (virtual) on 12.07.2022
- Divisional Meeting (virtual) on 25.08.2022
- Meeting to discuss the issue of procurement of the vehicles for KVKs/ATARIs (virtual) on 29.08.2022
- GeM meeting chaired by ASFA (virtual) on 06.09.2022
- DAMU ZBA Meeting of KAU KVKs (virtual) on 24.11.2022
- DAMU ZBA Meeting (virtual) on 25.11.2022
- Budget Meeting (virtual) on 14.12.2022
- GeM meeting chaired by ASFA (virtual) on 20.12.2022



Chapter - 8

Farmers Feedback on Assessed Technologies of Crops and Livestock

State wise farmers feedback on performance of production technologies of crops and livestock through OFTs are presented in this chapter.



Krishi Vigyan Kendras 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 farmer's feedback on performance of crop varieties (Table 125), agronomic practices (Table 126), pest and disease management (Table 127), farm machineries (Table 128), and livestock and fisheries technologies (Table 129) are given as under.

Table 125: Farmers feedback on performance of crop varieties

Crop varieties/hybrids assessed/ demonstrated	Farmer's feedback
Wheat	UAS-304 dwarf variety recorded larger ear head as compared to DWR -162 and tolerant to rust.
Groundnut	Dh-256 tolerant to foliar diseases and recorded higher yield compared to TMV-2.
Sorghum	SPV-2217 recorded higher grain and fodder yield as compared to M 35-1.
Chilli	Arka Khyati hybrid recorded 10% higher fruit yield per plant than the existing hybrids. It is suitable for both fresh and dry chilli market.
Capsicum	Arka Athulya hybrid is tolerant to powdery mildew disease. It has long shelf life and fetches higher market price.
Turmeric	CIMAP Pitamber is a short duration variety (Harvest at 180-185 DAP) and high curcumin content 6.2 to 7.3%. Due to short duration, the variety escapes leaf spot and rhizome rot in November & December months.
Field bean	HA-4 variety, more branches, recorded higher yield and has smaller seed size as compared to local variety.
Rice bean	KBR-1 is suitable for less fertile soils and has resistance to diseases.
Fodder sorghum	Variety, COFS-31 recorded higher yield, leaves are succulent, easy to harvest, and no spines on edge of leaves.
Ridge gourd	Arka Prasanna is an early maturing variety; fruits are tender with good taste and low incidence of powdery mildew compared to local variety.
French bean	Arka Arjun recorded higher yield and has stringless pods with good cooking quality.
Dolichos bean	Arka Amogh recorded higher yield with consumer acceptability.
Coriander	Arka Isha recorded higher yield, higher shelf life with low cost of cultivation due to multiple cuttings.
Onion	Bheema Super recorded 26% higher yield bulbs are attractive with light pink colour and fetches higher market price compared to local Ballary Red variety.
Potato	Kufri Karan is tolerant to late blight and reduced fungicidal usage.

Tuberose	Arka Prajwal is medium sized with light pinkish colour and higher number of florets per plant. It is suited for loose flowers and garland. It has 2 to 3 days shelf life.
Turmeric	IISR Pratibha is a high yielding variety. It is a shade tolerant crop and suitable for pure crop as well as inter crop in Arecanut garden.
Ragi	Variety, KMR-630 is a short duration, drought resistant and recorded higher fodder yield.
Bengal gram	JG-11 is a wilt resistant variety and recorded higher yield.
Paddy	Variety, GNV-1109 is suitable for saline soils, tolerant to blast disease and preferred for making puffed rice.
Castor	ICH 66 variety is disease resistant, bold seeded and fetches higher market price than local variety.
Bhendi	Phule Vimukta is resistant to yellow vein mosaic disease, recorded higher yield and bigger fruits.
Blackgram	LBG-791 resistant to yellow vein mosaic disease.
Pigeonpea	Variety, GRG-152 recorded lower pods per plant compared to TS-3R.
Finger millet	KMR-630 is a short duration variety, well suited for late sowing and double cropping system.

Table 126: Farmers feedback on performance of agronomic practices

Agronomic practices	Farmers feedback
Bed method of Cultivation in turmeric	This method helps in performing interculture operations, intercropping, enhance rhizome penetration helps to drain out the excess water during rainy season.
Banana special as all-in-one micro nutrient solution.	Foliar spray of banana special supplies adequate micronutrient which helps to increase the yield and reduces cost of production.
Trichoderma seed treatment in Groundnut	Trichoderma seed treatment reduced root rot disease.
Seed treatment with Biofertilizers like <i>Rhizobium</i> and PSB	Helps to reduce use of nitrogenous and phosphatic fertilizers
Use of pulse magic in Greengram	Foliar spray of pulse magic in greengram at flowering stage helped in healthy growth of plant without any deficiency symptoms besides increasing number of pods per plant and resulted in higher grain yield.
Adoption of border crop and trap crops in Byadagi Chilli	Maize as border crop and marigold as trap crop resulted in less incidence of sucking pest and fruit borer respectively.
Foliar spraying of Sampoorna in rice	Paddy farmers got higher yield along with increased grain weight compared to other areas

Application of Nano Urea in paddy	Easy to apply and reduced cost of cultivation which resulted in increased income.
Plastic mulching in black pepper	Mulching reduced wilt incidence.
Paired row planting in rice	This method resulted in 48% increase in yield, planting operation is time consuming and makes intercultural operations are easy.
Trash mulching in Sugarcane	Weed management made easy.
Nipping in Pigeonpea	This method recorded higher yield and quality produce.
Foliar nutrition spray in Cotton	Foliar nutrition spray in Cotton reduced leaf reddening and got higher yield.
Maize + Pigeon pea (3:1)	Maize (CP-818) and pigeonpea (TS-3R) intercropping recorded higher profitability as compared to mono cropping of maize.

Table 127: Farmers feedback on performance of pest and disease management technologies

Pest and disease management in crops	Farmer’s feedback
Management of leaf webber in redgram	Spraying of the Trifenophos for the management of early instar of pod borer reduced the pest infestation.
Seed treatment to manage pests in Byadagi chilli	Seed treatment of <i>Trichoderma viride</i> and Imidachloprid in Byadagi Chilli helped to reduce seedling rot and incidence of sucking pests at early vegetative growth stage.
IPDM in groundnut for major pest and disease	Use of Trichoderma as soil application reduced stem rot incidence and sticky blue traps reduced bud necrosis incidence.
Management of leaf miner in tomato	Use of Pheramone traps in tomato reduced fruit damage.
Management of pod borer in bengalgram	Use of Pheramone traps in Bengal gram reduced fruit damage.
Management of wilt incidence in black pepper	Use of bio agent Arka Microbial Consortium reduced wilt incidence to 8% from 22%.
Management of leave spot of disease and incidence thrips in chrysanthemum	Use of bio agents <i>Trichoderma</i> , <i>Pseudomonas</i> , neem soap, yellow sticky trap decreased leaf spot of disease and incidence thrips in Chrysanthemum.
Bio-intensive management of Fall Army Worm (<i>Spodoptera frugiperda</i>) in Maize	Use of pheromone traps controlled Fall Army Worm in maize.
Management of Rugose white fly in Coconut	It is an effective technology, but it needs to be implemented by all the farmers of the cluster.
Use of bio formulations for management of diseases in Pomegranate	Application of AMC + ACT and drenching with <i>Aspiligus niger</i> + <i>Pseudomonas</i> + VAM reduced the disease incidence and improved the fruit quality.

Table 128: Farmers feedback on performance of farm machinery technologies

Farm machinery technologies	Farmer's feedback
Manually drawn onion seeder	Use of manually drawn onion seeder saved 30% seed. However, seeder design needs to be improved by reducing row to row and plant to plant spacing.
Sugarcane harvesting machine	Sugarcane harvesting machine is a better option to solve the labour problem during peak harvesting period.
Mechanized transplanting	Mechanized transplanting in paddy has reduced the dependence on labours and cost of transplanting which resulted in reduction in production cost.
Seed cum fertilizer drill	Use of Seed cum fertilizer drill has reduced seed rate in Maize and Groundnut crops and cover larger area in a short period.
Battery operated Onion detopper	Use of battery operated onion detopper reduced drudgery of operation involved in manual detopping of onions and saved time.
Paddy Harvester	Use of paddy harvester reduced labour requirement and saved time required to harvest harvesting paddy.
Portable high head sprinkler gun	Water application and water use efficiencies were maximum in case of rain gun sprinkler irrigation system as compared to basin and furrow irrigation system. It saved 50% of the water used by flood irrigation. It also saved labour and electricity.
Battery operated banana pseudostem injector	Use of battery operated banana pseudostem injector resulted in reduction in the pesticide quantity and free from limitation of weather conditions.
Soil Moisture Indicator Tool	Soil Moisture Indicator Tool helps to know soil moisture status which is easy to understand, saves water, electricity and time. This is suitable for knowing moisture content in different types of soils and useful in nurseries and potted plants.
Fruit plucker for harvesting clove	Fruit plucker is very simple and light in weight. The picker is suitable for harvesting fruits from a 5–6 meter height tree. The efficiency of fruit picker was found to be 38.93 kg/8hrs. for clove
Machinal harvesting of Bengal gram	Use of machinal harvesting of Bengal gram reduced labour cost and time.
Super Grain Bags	Use of super grain bags increased storage life by 6 months and decreased loss by 9 to 12 %.
Nutmeg seed sheller	Use of nutmeg seed sheller saved time, labour and easy to use.
Demonstration of Mango ripening chamber	Ripening takes place without hazardous effect of chemicals and tastes good
Drones for spraying micronutrients	Use of drone in spraying micronutrients covered larger area in a short period and reduced labour requirement.

Table 129: Farmers feedback on performance of livestock and fisheries technologies

Livestock/fisheries technologies	Farmer's feedback
Pangasius fish farming	Pangasius fish under monoculture at high density stocking in farm pond. The fish growth is faster than carp species. Fish is resistant to water quality changes.
Supplementation of bypass fat for higher milk and fat yield in buffaloes	Feeding of bypass fat and area specific mineral mixture increased milk yield and fat in buffaloes.
Integrated reproductive management for anoestrous in cattle	Hormonal therapy was found to be beneficial for increasing the conception rate in the cattle.
Black Soldier Fly (<i>Hermetia illucens</i>) larvae as protein source in poultry feed	Black Soldier Fly Larvae is very useful to convert biodegradable waste (Vegetable waste -0.5 kg + Poultry waste -3 kg + Rice bran -0.5 kg.) into useful larvae converted to one kg of BSF larvae. The frass and the wash obtained during the BSFL production can be utilized as manure.
Integrating fish and duck for the utilization of homestead pond for augmenting farm income	Integrating fish (Tilapia) and duck farming (Kuttanad layer duck) was found very effective to improve growth rate as well as weight of the bird. Improvement of growth rate of fingerlings was 25% over a period of 6 months. Fish yield increased as compared to check.
TANUVAS-TRPVB Tick shield to mitigate the acaricidal resistance of ectoparasites in dairy animals	A reduction in infestation was observed as 25% when compared to check. Milk yield also improved as 13 % when compared to check.
Tree Leaf Meal incorporated concentrate feed for backyard native chickens	Introduced a replacement to conventional chicken feed (grains alone) with nutritious (Rice + Wheat + Egg shell+ Drum stick leaves + Oil cake + Azolla) without over-dependence on grains.
Preservation of green fodder in the form of silage using silo bags	Silo bags can be repeatedly used for preparation of silage and good quality silage can be obtained. Silage preparation using silo bags requires less space and feeding of silage increased milk yield by 10%.
Azolla as economic feed supplement in ducks	Farmers are using azolla as an economic feed protein rich supplement for increasing egg production which reduced the concentrate feed cost by 25%.

Prevention & control of milk fever in cross breed cows	Feeding calcium in advance pregnancy and immediately after pregnancy can save life of cow.
Ultra-high density moringa planting as forage for cows	Palatability of moringa is less compared to other fodder and recorded higher milk yield.
Use of Pro-biotics	Pro-biotics helped gaining body weight and reduced incidence of diarrhea in lambs. Increased the net income by 31%.



Chapter - 9

Personnel

The sanctioned staff strength of ICAR-ATARI includes:

- Research Management Position
- Scientists
- Technical Personnel
- Administrative Staff



Staff working in ICAR-Agricultural Technology Application Research Institute, Zone XI, Bengaluru as on 31December, 2022 is presented below.

Cadre	Name	Designation
Research Management Position	 Dr. V. Venkatasubramanian	Director
Scientific	 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)
Technical	 Dr. Mallikarjun B. Hanji	Chief Technical Officer (Computer)
	 Shri. Hemanth Kumar	Driver
Administrative	 Shri. Shaik Rukman	Assistant Finance & Accounts Officer
	 Shri. J. Mathew	Administrative Officer (additional charge)
	 Mrs. Ramola Pinto	Junior Stenographer
	 Ms. Roopakala K	Upper Division Clerk





ICAR - Agricultural Technology Application Research Institute, Zone XI

(Indian Council of Agricultural Research)

H.A. Farm Post, Hebbal, Bengaluru - 560 024, Karnataka, India

Phone : 080-234101614

Fax : 080-23410615

Web : <https://atari.bengaluru.icar.gov.in>

Email : atari.bengaluru@icar.gov.in

