हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch

KVKs 1974-2024
कृषि विज्ञान केन्द्र
Krishi Vigyan Kendra
Serving Farmers

वार्षिक प्रतिवेदन
Annual Report
2023

भाकृअनुप
ICAR

ICAR-Agricultural Technology Application Research Institute, Zone-II

भाकृअनुप–कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान, क्षेत्र–II

(ISO 9001-2015)

Jodhpur-342 005, Rajasthan, India

जोधपुर 342 005, राजस्थान, भारत

अटारी ATARI
JODHPUR
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Cover photographs

- Crop cafeteria block of rabi crops at KVK, Kota
- Farmers participatory seed production of mungbean at village Basani Sahaja under KVK, Nagaur-I
- Strawberry intercropped with cauliflower at KVK Farm, Tonk
- Cumin at Keshwana village under Jalore-I KVK

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Citation

@ 2023. ICAR-Agricultural Technology Application Research Institute, Jodhpur, Pp. 167.

Printed at

Evergreen Printers, 14-C, Heavy Industrial Area, Jodhpur - 342 003 # 9414128647

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PREFACE

The 2030s decade is the witness of two landmarks in National Agricultural Research, Education, Extension System (NAREES) in India. The year 2024 is being celebrated as the Golden Jubilee Year of KVKs establishment and 2029 shall be the Centenary Year of ICAR's establishment. In March 1974, under the dynamic leadership of *Bharat Ratna* (Late) Prof. M. S. Swaminathan, a structural change was unfolded in NAREES when the first KVK was established in erstwhile Pondicherry (renamed as Puducherry in 2018) with a strong support from the Government. This path breaking policy decision of establishing special purpose vehicle for dissemination of technologies through frontline extension popularly called as KVK (Krishi Vigyan Kendra) brought a new dimension in agri-research-education-extension linkages. The KVKs, since 1974, have marched briskly with the research and development agencies and partnered actively in all the major agricultural revolutions in the country. India's model of research-extension integration has been appreciated globally and adopted in many developing countries. The movement which started with 1 KVK in 1974 kept on adding and become 731 in 2024. Today, one KVK exists in each rural district while larger districts have 2 KVKs.

The KVKs since their inception have been working under diverse and complex man-animal-plant-material and machine interface. During their inception and formative stage, they worked for dissemination and deployment of green revolution technologies to achieve higher foodgrains production. The consolidation phase of KVKs coincided with mission-mode actions for enhancing oilseeds and pulses production under Technology Mission on Oilseeds & Pulses (TMOP) in 1986 onwards. The efforts of KVKs and other agencies doubled oilseeds production between 1986 to 1998, although the pulses remain static. Post 1991, when economic liberalization opened various sectors for global players and markets, the KVKs took a driving seat and popularised export focus crops and varieties and good agricultural practices (GAP) like basmati rice, fruits, vegetables for export promotion and import substituting crop like pulses, oilseeds, etc. They proved reliable player for last mile delivery of improved technologies and farm advisories, much faster than the mass extension system. Several of the innovative programs in which KVKs proved their mettle during 70s, 80s and 90s were Lab to Land (1979), Integrated Cereal Development Programme (ICDP 1992), Technology Mission on Cotton (1995). The KVK's mandate evolved over time from vocational training to technology assessment and demonstration for its application and capacity development. Presently, KVKs are single window for knowledge resource for technologies and advisories. The extension system is evolving itself moving away from input and production centric technology transfer to market-led,

income augmenting and job creating vocational trainings. The actions and activities of KVKs left strong footprints with remarkable policy implications and far-reaching impacts in agriculture and allied sectors in India. While dealing and delivering its prime and core responsibilities of science-based frontline extension, they worked for all the national priorities and contributed significantly in green, white, yellow, brown, pink and sweet revolutions. The recent revolutions in pulses and sugar production are the testimony of KVKs contribution aligned with Agriculture Export Policy, 2018. Promotion of millets and millet products and biofortified crop varieties is another policy implications towards food security and nutrition of the households. The capacity development of farmers for Good Agriculture Practices (GAPs) and popularization of export focus crops and their varieties under one-district-one product initiative is the focus of KVKs in the changing scenario along with reducing food loss and waste through improving capacities of farmers and entrepreneurs in food processing. KVKs are also contributing in implementation of non-price policies for quality, diversification and value addition and providing market information and advisories for price policy implementation thereby adding to income and livelihood of the people.

Dissemination of production centric technologies has been the forte of frontline extension system that equally contributed for natural resource and stress management under climate change initiatives aligning with national priorities of reducing GHGs emissions and economising the chemical fertilizer usage. Agro-advisories for de-risking of farmers is one of the core delivery services of KVKs. Post-Agriculture Export Policy, 2018, India is exploring for new export destination with quality produce. KVKs have augmented their efforts for diversification, and introduction of export focus crops and capacity development of producers and produce owners for quality produce with minimum chemical loads in the produce. They have joined hands with all the line departments including agencies such as APEDA and other export agencies/private players for creating awareness about sanitary and phyto-sanitary standards (SPSs) in export materials. The successes in basmati rice, pomegranate, cumin, groundnut, date palm, medicinal and aromatic plants, etc are very encouraging. In the present context of agri-food system and ecological services, the KVKs are focussing on awareness and capacity development at all points of value chain and sustainable management of the natural resources.

The role and nature of agricultural extension including frontline extension is changing with rising aspirations and expectations of farmers and policy makers from agriculture. The entire extension system is changing with pluralistic approach by involving private, public, NGOs, FPOs, FPCs, SHGs, with much space and scope to decentralized decision making and advisories, contracting for extension services and its cost recovery. The greater attention is now towards making advisory services a demand-driven service. As Indian agriculture is being reimagined with deeper penetration of digital technologies and hand-held ICT devices, the KVKs have positioned themselves to provide demand-driven services to the farmers for smart farming. Several innovations are already in the offing in extension services with ICT interface focussing on farmers, youths, entrepreneurs, e-market platform, input dealers, local food systems and nutrition, value addition, product diversification and technology incubation and climate smart extension in agriculture. The past has been glorious and the future is full of potentials and prospects for the farmers and the farming. We need to look at and practice agriculture differently than what we have been doing in the past. The KVKs are always there for the service of farmers and farming in all the changed and changing scenarios.

Place : Jodhpur
Date : June 5, 2024

(J.P. Mishra)

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कार्यकारी सारांश

भाकृअनुप–कृषि तकनीकी अनुप्रयोग अनुसंधान संस्थान, जोधपुर अग्रणी प्रसार शिक्षण कार्यक्रमों के समन्वय और निगरानी के साथ–साथ कृषि विज्ञान केन्द्रों, भाकृअनुप के संस्थानों और कृषि विश्वविद्यालयों के माध्यम से कृषि प्रसार अनुसंधान और ज्ञान प्रबंधन को मजबूत करने और प्रौद्योगिकी अनुप्रयोग एवं अनुसंधान के लिए कार्यरत है। राजस्थान, हरियाणा और दिल्ली राज्यों में अटारी–केवीके–भाकृअनुप संस्थानों के माध्यम से कई नवीन पहल की गयी हैं।

अग्रणी प्रसार और प्रक्षेत्र परीक्षण

वर्ष 2023 के दौरान, 11 नई फसल किस्मों का 8963.9 हेक्टेयर क्षेत्र में 23475 अग्रिम पंक्ति प्रदर्शनों द्वारा बढ़ावा दिया गया। राष्ट्रीय खाद्य सुरक्षा मिशन के अतंर्गत तिलहन और दलहन के उत्पादन को बढ़ाने के लिए दलहन पर 6985 और तिलहन पर 6416 समूह अग्रिम पंक्ति प्रदर्शन लगाये गये। पशुधन की 3 और मुर्गियों की 4 उन्नत नस्लों को 305 प्रदर्शनों द्वारा बढ़ावा दिया गया। विविध सूक्ष्म परिस्थितियों में एकीकृत फसल प्रबंधन, एकीकृत कीट प्रबंधन, खरपतवार प्रबंधन, उन्नत और उच्च उपज देने वाली प्रजातियों, संकर किस्मों, पशुधन प्रबंधन, कृषि मशीनरी, कृषक परिवारों के पोषण और स्वास्थ्य पहलुओं आदि पर 299 तकनीकियों के कुल 2468 प्रक्षेत्र पर परीक्षण आयोजित किए गए। अनार, जीरा, मैथी और सौंफ पर उत्पन्न समस्याओं के निदान के लिए कृषि विज्ञान केन्द्र समूह अवधारणा पर कार्य कर रहे हैं।

प्रशिक्षण और क्षमता विकास

वर्ष 2023 के दौरान केवीके ने 3921 प्रशिक्षण पाठ्यक्रमों में 114156 पुरूष एवं महिला किसानों को प्रशिक्षण प्रदान किया। गैर–संस्थागत प्रशिक्षणों में किसानों की भागीदारी संस्थागत प्रशिक्षणों की तुलना में 27% अधिक थी। अनुसूचित जनजाति के किसानों की भागीदारी संस्थागत प्रशिक्षणों में 35.4% और गैर–संस्थागत प्रशिक्षणों में 34.5% थी। केवीके के द्वारा अनार में कैनोपी प्रबंधन, निर्यात केंद्रित फसल और अच्छी कृषि पद्धतियों पर विशेष प्रशिक्षण कार्यक्रमों के आयोजन की नवीन पहल की गई।

सूचना एवं प्रसार सेवाएँ

जोन–2 के केवीके ने 12561 सलाहकार सेवाएं, 1498 नैदानिक दौरे किये। कुल 442 प्रक्षेत्र दिवस, 683 समूह चर्चाएं, 669 किसान गोष्ठी, 1010 फिल्म शो, 101 किसान मेले, 683 प्रदर्शनियां, 4605 वैज्ञानिकों का किसानों के खेतों का दौरा, 601 पद्धति प्रदर्शन आयोजित किए जिसमें 3389715 किसानों और 28567 प्रसार कर्मियों, इनपुट डीलरों, स्थानीय व्यापारियों और सार्वजनिक नेतृत्व की भागीदारी रही। इसके अलावा केवीके द्वारा इलेक्ट्रॉनिक मीडिया, समाचार पत्र कवरेज, रेडियो वार्ता, टेलीविजन वार्ता, लोकप्रिय लेख, पशु स्वास्थ्य शिविर के माध्यम से 204739 अन्य प्रसार गतिविधियाँ का प्रदर्शन किया गया। वर्ष 2023 में, मिट्टी के 17134, पानी के 7744 और पौधों के 3932 सहित कुल 22404 नमूनों का विश्लेषण किया गया, जो 3582 गांवों और 22404 किसानों के खेतों से लिये गये।

फसल अवशेष प्रबंधन

राष्ट्रीय राजधानी क्षेत्र में फसल अवशेष प्रबंधन प्राथमिकता है, जिसके लिए हरियाणा के 15 कृषि विज्ञान केन्द्रों ने चावल के अवशेषों के प्रबंधन और पराली को जलाने से रोकने के लिए सूचना, शिक्षा और संचार गतिविधियों का आयोजन किया, जिसमें 20542 किसान सीधे तौर पर शामिल हुए। इस परियोजना के तहत बोये गये गेहूँ की उपज (51.45 क्वि./है.) पारंपरिक तरीके से बोये गये गेहूँ की उपज (48.04 क्वि./है) से 7.1% अधिक थी तथा गेहूं की खेती की लागत में रु. 2627/हेक्टेयर की बचत हुई।

अनुसूचित जाति और अनुसूचित जनजाति के किसानों को लाभ

जोन–2 के केवीके जनजातीय उप–योजना (टीएसपी) और अनुसूचित जाति उप–योजना (एससीएसपी) योजनाओं पर काम कर रहे हैं। राजस्थान के कुल 24 केवीके टीएसपी के कार्यान्वयन में और 15 केवीके (राजस्थान के 9 और हरियाणा के 6) एससीएसपी के कार्यान्वयन में शामिल हैं। टीएसपी के तहत, उन्नत तकनीकियों पर 33 संस्थागत परीक्षण और 3645 आदिवासी किसानों के खेतों पर 4922 प्रथम पंक्ति प्रदर्शन आयोजित किए गए। इन योजनाओं के माध्यम से 79941 एसटी और 48855 एससी के किसानों को लाभ हुआ।

महत्वपूर्ण उत्पादन आगतों (इनपुट) की आपूर्ति

वर्ष 2023 के दौरान केवीके ने विभिन्न फसल समूहों के 14207.02 क्विंटल बीज का उत्पादन किया, जिनकी कीमत रु 496.51 लाख थी। जिसमें से 63% से अधिक मात्रा अनाज, 16. 6% दालों और 13.8% तिलहन के बीजों की थी। बाजरा और चारा फसलों की हिस्सेदारी 4.6% और बागवानी फसलों की हिस्सेदारी 2% थी। यह बीज 8694 किसानों को प्रदान किया गया। इसके अलावा, बागवानी फसलों की 79368 रोपण सामग्री भी उत्पादित की गई और 906 किसानों को और 193 अनुसूचित जाति के किसानों को 45095 पशुधन नस्लें और फिंगरलिंग उपलब्ध कराई गईं। दालों पर बीज केंद्र कार्यक्रम राजस्थान और हरियाणा में 10 केवीके में क्रियान्वित है। 2023 के दौरान सहभागिता के माध्यम से कुल 3556.01 क्विंटल दालों के बीज का उत्पादन किया गया है।

किसानों की आय बढ़ाना

नेटवर्क परियोजना ''नई विस्तार पद्धति और दृष्टिकोण–किसानों की आय बढ़ाना'' के अतंर्गत 11 अटारी और नौ भाकृअनुप के संस्थानों को शामिल करके कार्यान्वित की गई है। ट्रांस–गंगा मैदानी क्षेत्र में प्रदर्शित तकनीकियों के सकारात्मक प्रभाव के कारण 2016–17 की तुलना में 2020–21 में कृषि क्षेत्र के रकबे में वृद्धि, नई फसलों की शुरूआत एवं गोद लिए गए और अन्य गांवों में पशुधन की संख्या में वृद्धि हुई है। दूसरी तरफ गोद न लिए गए गांवों में अनाज के रकबे में गिरावट दर्ज की गई। वहीं गोद लिए गए गांवों में दलहन, सब्जियों में 173.7 और 270 प्रतिशत की आशाजनक वृद्धि दर्ज की गई और गैर–गोद लिए गए गांवों में तिलहन में 41.9 प्रतिशत और सब्जियों में 279.9 प्रतिशत की वृद्धि हुई। गोद लिए गए गांवों में मवेशियों की संख्या में 95.8 प्रतिशत और भैंसों की संख्या में 59.8 प्रतिशत की वृद्धि हुई, जबकि गैर–गोद लिए गए गांवों में 12.2 और 21.5 प्रतिशत की वृद्धि हुई। निष्कर्षों से पता चला कि नवीन तकनीकी ने कृषि पद्धतियों को सकारात्मक रूप से प्रभावित किया है। दलहनी और सब्जियों की खेती में हुई उल्लेखनीय वृद्धि किसानों का उच्च मूल्य वाली फसलों की ओर बदलाव का संकेत देती है, जो संभावित रूप से कृषि आय में वृद्धि में योगदान करती है। इसके अलावा, गोद लिए गए गांवों में पशुधन आबादी में पर्याप्त वृद्धि एवं पशुपालन तकनीकों में सुधार के कारण किसानों की आजीविका में सुधार की संभावना बढ़ी। विभिन्न कृषि और संबद्ध क्षेत्रों में किए गए नवाचार के कारण परिवारों की उच्चतम औसत शुद्ध आय पूरक उद्यमों के साथ 208 प्रतिशत तक बढ़ी, इसके बाद बागवानी से 190 प्रतिशत, 171 प्रतिशत पशुधन से और 115 प्रतिशत क्षेत्रीय फसलों से बढ़ी जबकि गैर–गोद लिए गए गांवों में आय क्रमशः 100, –4, 87.7 और 51.7 प्रतिशत थी। अग्रिम पंक्ति के प्रसार संस्थानों के तकनीकी हस्तक्षेप और किसानों द्वारा इसे अपनाने से छोटे किसानों की आय 2.46 गुना और सीमांत, मध्यम और बड़े भूमि धारकों की आय क्रमशः 2.29, 2.11 और 2.10 गुना तक बढ़ गई। गोद लिए गए गांवों में रोजगार में 1.21 गुना की वृद्धि भी किसानों को विविध रोजगार में बेहतर संलग्न होने और कृषि और गैर–कृषि गतिविधियों में आय बढ़ाने के लिए प्रेरित करने में प्रसार प्रणाली की सकारात्मक भूमिका का प्रतीक है।

प्राकृतिक खेती को बढ़ावा

देश में प्राकृतिक खेती को बढ़ावा देने की परियोजना में राजस्थान, हरियाणा और दिल्ली के कुल 38 केवीके प्रयासरत है। 2023 के दौरान, प्राकृतिक खेती के विभिन्न पहलुओं पर कुल 1163 जागरूकता कार्यक्रम, 60 प्रशिक्षण कार्यक्रम आयोजित किए गए, जिनमें क्रमशः 87093 और 2543 किसानों ने भाग लिया। इसके अतंर्गत 298.3 हेक्टेयर में 787 प्रदर्शनों का आयोजन किया गया। राजस्थान में गेहूं, मोठ, बाजरा, सरसों, चना, मूंग, जौ, जीरा, हल्दी, अश्वगंधा, आंवला, नींबू, टमाटर, बैंगन, भिंडी, मिर्च, हरियाणा में चना, अलसी, गेहूं, मक्का, धान, जौ, गन्ना, सरसों, मूंग, कपास, आम, केला, बेर, शकरकंद, टमाटर, कद्दू, प्याज, गाजर, मूली आदि और दिल्ली में गेहूँ, चना, लौकी आदि प्राकृतिक कृषि पद्धतियों और नवाचार के साथ उगाई जाने वाली प्रमुख फसलें हैं। प्राकृतिक खेती के कारण मिट्टी की जल धारण क्षमता में वृद्धि और मिट्टी के स्वास्थ्य में सुधार के साथ ही लागत में 12–45% की बचत हुई है। किसानों को प्राकृतिक खेती के उत्पादों की बेहतर कीमत भी मिली है।

जलवायु अनुकुल प्रौद्योगिकियाँ

जलवायु अनुकूल कृषि पर राष्ट्रीय नवाचार (NICRA) परियोजना के तहत राजस्थान और हरियाणा के 18 केवीके ने गांवों में किसानों के खेतों में जलवायु अनुकुल प्रौद्योगिकियों का प्रदर्शन किया। निकरा के तहत विभिन्न मॉड्यूल (प्राकृतिक

संसाधन प्रबंधन–871, फसल उत्पादन–2824, पशुधन और चारा उत्पादन–1377, कस्टम हायरिंग सहित संस्थागत हस्तक्षेप–2151, क्षमता निर्माण–5366, प्रसार गतिविधियां–11943) पर आयोजित कार्यक्रमों में कुल 24532 किसानों ने भाग लिया। कस्टम हायरिंग केन्द्रों द्वारा 200171.0 रुपये का राजस्व अर्जित किया गया, जिससे 2151 किसानों को लाभ हुआ और 2229 हेक्टेयर क्षेत्र को कवर किया गया।

फार्मर फर्स्ट एवं आर्या

फार्मर फर्स्ट कार्यक्रम को दिल्ली, हरियाणा और राजस्थान के 12 भाकृअनुप के संस्थानों और राज्य कृषि विश्वविद्यालयों द्वारा कार्यान्वित किया जा रहा है। फार्मर फर्स्ट कार्यक्रम के अन्तर्गत बागवानी में 1086 किसानों को सम्मिलित करते हुए 6 प्रदर्शन, फसल–आधारित प्रणाली में 2380 किसानों को सम्मिलित करते हुए 21 प्रदर्शन, पशुधन और चारा–आधारित प्रणाली में 8850 पशुधन और 2996 कृषक परिवारों को सम्मिलित करते हुए 14 प्रदर्शन आयोजित किए गये। एकीकृत कृषि प्रणाली के तहत 187 भागीदार किसानों को शामिल करते हुए 4 इकाइयां स्थापित की गईं। कुल 26 क्षमता निर्माण कार्यक्रम आयोजित किए गए जिनमें 1378 किसानों और कृषक महिलाओं ने भाग लिया। कुल 7869 किसानों और कृषक परिवारों को शामिल करते हुए विभिन्न मॉड्यूल के तहत 62 सहभागी प्रदर्शन आयोजित किए गए। आर्या के तहत, 86 युवाओं को प्रशिक्षित किया गया, जिनमें से 30 ने अपनी उद्यम इकाइयाँ स्थापित कीं।

कृषि-ड्रोन

जोन 2 के अतंर्गत, राजस्थान और हरियाणा में 25 संस्थानों (10 केवीके, 11 भाकृअनुप संस्थान और 4 कृषि विश्वविद्यालयों) को 32 ड्रोन प्रदान किये गए। कुल 32 ड्रोन खरीदे गए हैं और 27 ड्रोन पायलटों ने प्रशिक्षण लिया है। 2816 हेक्टेयर क्षेत्र में कीटनाशकों आदि के प्रयोग पर कुल 2289 क्षेत्रीय प्रदर्शन आयोजित किए गए जिनमें 83660 किसानों ने भाग लिया।

सूचना एवं संचार प्रौद्योगिकी (आईसीटी) का अनुप्रयोग

किसान सारथी भाकृअनुप और डिजिटल इंडिया कॉर्पोरेशन, इलेक्ट्रॉनिक्स और सूचना प्रौद्योगिकी मंत्रालय, भारत सरकार की एक संयुक्त पहल है। अब तक जोन–2 के 66 केवीके किसान सारथी पोर्टल पर पंजीकृत हैं। मार्च 2022 में इसकी शुरुआत के बाद से केवीके द्वारा कुल 3,671,687 किसानों को किसान सारथी पोर्टल पर पंजीकृत किया गया है।

सहयोग और अभिसरण

भाकृअनुप–अटारी, जोधपुर कृषि और किसान कल्याण विभाग; मत्स्य पालन; पशुपालन और डेयरी मंत्रालय; ग्रामीण विकास मंत्रालय; जलशक्ति मंत्रालय; नीति आयोग; खाद्य प्रसंस्करण उद्योग मंत्रालय; सूक्ष्म, लघु और मध्यम उद्यम मंत्रालय; पृथ्वी विज्ञान मंत्रालय, पेट्रोलियम मंत्रालय, महिला एवं बाल विकास मंत्रालय, राष्ट्रीय कृषि विस्तार प्रबंधन संस्थान, अर्ध–शुष्क उष्णकटिबंधीय के लिए अंतर्राष्ट्रीय फसल अनुसंधान संस्थान, भारतीय किसान उर्वरक सहकारी समितियां, केंद्रीय मीठे पानी जलीय कृषि संस्थान, आकाशवाणी, राष्ट्रीय सहकारी विकास निगम आदि के साथ मिलकर काम कर रहा है। आईसीएआर–उद्योग इंटरफेस के तहत, भाकृअनुप–अटारी बायर, धानुका, अमेजॅन, बाड़मेर लिग्नाइट कंपनी लिमिटेड, अल्ट्रा टेक सीमेंट (बिरला ग्रुप), शिव किसान फार्मर्स प्रोड्यूसर्स कंपनी, बालोतरा के साथ काम कर रहा है। भाकृअनुप–अटारी, जोधपुर ने अनुसंधान, शिक्षा और विस्तार गतिविधियों को बढ़ावा देने के लिए कृषि विश्वविद्यालय, जोधपुर के साथ एक समझौते पर भी हस्ताक्षर किए।

राष्ट्रीय एवं क्षेत्रीय अभियान

सितंबर 2023 से 25 जनवरी 2024 के दौरान राजस्थान, हरियाणा और दिल्ली की सभी ग्राम पंचायतों में विकसित भारत संकल्प यात्रा शुरू की गई। केवीके ने मिट्टी के स्वास्थ्य, जैविक खेती, प्राकृतिक खेती, टिकाऊ कृषि और जलवायु अनुकुल प्रौद्योगिकियों के बारे में जागरूकता पैदा की। सभी 66 केवीके ने इस यात्रा में सक्रिय भाग लिया और 5951 व्याख्यान दिए, कुल 3030564 किसानों को सम्मिलित करते हुए 6471 ग्राम पंचायतों में यह अभियान चलाया गया।

संसाधन सृजन और सी.एस.आर निधि

केवीके, बाड़मेर–द्वितीय ने प्रशिक्षण और प्रदर्शन के माध्यम से ग्रामीण परिवारों की आय में सुधार के लिए बाडमेर लिग्नाइट माइनिंग कंपनी लिमिटेड से 880 लाख का फंट जुटाया। केवीके, करनाल ने सीएसआर फंडिंग के तहत एआईसी

ऑफ इंडिया लिमिटेड, नई दिल्ली से 98.54 लाख रुपये का फंड जुटाया। सीएसआर फंडिंग के लिए अल्ट्राटेक और अंबुजा सीमेंट और अन्य उद्योगों/कॉर्पोरेटों के साथ चर्चा हुई। वर्श 2023 में केवीके द्वारा रु. 1373 लाख रुपये की निधि को जुटाया गया जबकि वर्ष 2022 में यह 1147 लाख रूपये था। प्रायोजित और बाह्य वित्त पोषित परियोजनाओं से 566.69 लाख रुपये जुटाए गए।

नवीन आधारभूत निर्माण

वर्ष 2023 के दौरान, नए केवीके के चल रहे बुनियादी ढांचा निर्माण को पूरा करने के लिए 388.25 लाख रुपये प्रदान किए गए। जालोर–द्वितीय, पाली–द्वितीय और सीकर–द्वितीय में तीन केवीके के प्रशासनिक भवनों का निर्माण किया गया है। इसके अलावा, केवीके भीलवाड़ा–द्वितीय, जयपुर–द्वितीय, जालौर–द्वितीय, पाली–द्वितीय, प्रतापगढ़, सीकर–द्वितीय और उदयपुर–द्वितीय में किसान भवनों का निर्माण पूरा हो चुका हैं। 9 केवीके को रू 78.32 लाख नए वाहनों के लिए प्रदान किए गये।

उत्पाद व्यावसायीकरण और समूह गतिविधियाँ

वर्ष 2023 के दौरान जोन–2 के केवीके ने 150 से अधिक उत्पादों जैसे बाजरा, शहद, सीताफल, जामुन, गुलाब, दुग्ध उत्पाद, आंवला, बेर, आम, अचार, जैम, जेली, कैंडी आदि के व्यावसायीकरण को बढ़ावा दिया। केवीके, पाली–द्वितीय द्वारा सोजत मेहंदी जो कि जीआई आधारित उत्पाद है को बढ़ावा दिया गया। इसके अलावा सिरोही के आबू की सौंफ और नागौरी की पान मेथी के उत्पाद भी तैयार कर विपणन किया गया है। क्षेत्र में छह केवीके एफपीओ के सीबीबीओ के रूप में कार्य कर रहे हैं। इसके अलावा, केवीके ने व्यवसाय को बढ़ावा देने और बैकवर्ड और फॉरवर्ड लिंकेज के लिए 104 से अधिक किसान उत्पादक संगठन, स्वयं सहायता समूह और संयुक्त देयता समूह को तकनीकी सहायता प्रदान की गई।

मॉडल/विस्तार दृष्टिकोण

केवीके चूरू–प्रथम द्वारा किसानों की समस्याओं का समाधान करने के लिए किसान परामर्श कक्ष, केवीके जयपुर–प्रथम द्वारा यूरिया गुड़ बहु–पोषक तत्व ब्लॉक उत्पादन तकनीक तथा केवीके हिसार द्वारा किसानों के बीच गुणवत्तापूर्ण बीज उत्पादन उद्यम को बढ़ावा देना जैसे दृष्टिकोण को बढ़ावा देने का प्रयास किया गया।

शासन और मान्यता

राजस्थान के केवीके के लिए 10–11 जनवरी, 2023 को और हरियाणा और दिल्ली के लिए 18 जनवरी, 2023 को आयोजित बैठकों में केवीके की वार्षिक कार्य योजना को अंतिम रूप दिया गया। वार्षिक क्षेत्रीय कार्यशाला 19–21 जून, 2023 को उप महानिदेशक (कृषि प्रसार), भाकृअनुप की अध्यक्षता में कृषि विश्वविद्यानय, जोधपुर, राजस्थान में आयोजित की गई थी। अटारी की अनुसंधान सलाहकार समिति की बैठक 5–6 अगस्त, 2023 को बेंगलुरु में आयोजित की गई। 13वीं और 14वीं संस्थान प्रबंधन समिति की बैठकें क्रमशः 24 जुलाई, 2023 और 15 नवंबर, 2023 को आयोजित की गईं। जोन–2 के कुल 9 अरबपति किसानों और 67 करोड़पति किसानों को कृषि जागरण समूह द्वारा मान्यता के लिए नामांकित किया गया। इंडिया टुडे ग्रुप ने वर्ष 2023 में केवीके झुन्झुनु को सर्वोत्तम केवीके के लिए सम्मानित किया।

EXECUTIVE SUMMARY

ICAR-ATARI is mandated to work for technology application research along with coordination and monitoring of front-line extension, and strengthening of agricultural extension research and knowledge management. Several new initiatives have been taken through the network of ICAR-ATARI-KVK-SAUs in the States of Rajasthan, Haryana and Delhi.

Frontline Extension and On-Farm Trials

During 2023, 11 new varieties of crops were promoted through 23475 FLDs on 10743.15 ha farmers' fields. These included *878* cluster frontline demonstrations (CFLDs) on pulses and 8474 on oilseeds for enhancing oilseeds and pulses production. Three improved breeds of livestock and 4 varieties of poultry were also popularized in 305 demonstrations. Total 299 technologies on ICM, IPM, INM, integrated weed management, HYVs/hybrids, livestock management, farm machineries, nutritional and health aspects of farm families etc. were tested under diverse farming micro-situations through 2468 on-farm testing (OFTs). Cluster approach of KVKs adopted to solve emerging problems in pomegranate, cumin, fenugreek and fennel.

Trainings and Capacity Development

During 2023, total 114156 farmers including farm women were trained in 3921 training courses by KVKs of Zone-II. About 27% higher number of farmers participated in off-campus trainings as compared to on-campus trainings. The participation of SC/ST farmers in on-campus trainings was 35.38 % and 34.52% in off-campus trainings. Special trainings for canopy managers in pomegranate and good agricultural practices (GAPs) in export focus crops initiated.

Information and Extension Services

KVKs of Zone-II provided 12561 advisory services and conducted 1498 diagnostic visits. Total 442 field days, 683 group discussions, 669 kisan ghosthi, 1010 film shows, 101 kisan mela, 298 exhibitions, 4605 scientists' visit to farmers field, 601 method demonstrations with the participation of 3389715 farmers and 28567 extension personnel, input dealers, local traders, and public leadership was also organised. In addition, 204739 other extension activities viz. coverage in print and electronic media, animal health camps, etc were performed. Total 28820 samples including 17134 of soil, 7744 of water and 3932 of plants were analysed which represented 3582 villages and 22404 farmers' fields.

Crop Residue Management

Crop residue management campaign was organised by 15 KVKs of Haryana in NCR through various Information, Education and Communication (IEC) activities for in-situ management of rice residue and reduce its burning involving 20542 farmers directly. The average grain yield of wheat 51.46 q/ha was recorded under CRM which was 7.1% higher than conventional sowing methods (48.04 q/ha). The cost of cultivation was Rs. 2627 less in CRM (Rs 38665/ha) than conventional methods (Rs. 41292/ha).

Benefits to scheduled tribes and scheduled castes

KVKs of Zone-II have been implementing Tribal Sub-Plan (TSP) and Scheduled Caste Sub Plan (SCSP). Total 24 KVKs of Rajasthan implemented TSP and 15 KVKs (9 of Rajasthan and 6 of Haryana) for SCSP. Under TSP, 33 on-farm testing on improved technologies and 3645 FLDs at 4922 tribal farmers' fields were conducted. These programmes benefitted total 79941 ST and 48855 SC farmers including women farmers.

Supply of Critical Production Inputs

Total 14207.02 qtls of seeds of various crop groups worth Rs. 496.51 lakh were produced during 2023. Over 63% of the total quantity was shared by cereals followed by pulses (16.6%) and oilseeds (13.8%). The millets and fodder constituted 4.6% and horticultural

crops about 2%. These seeds were provided to 8694 farmers. Seed hub on pulses programme are operational in 10 KVKs in Rajasthan and Haryana. Total 3556.01 qtls of seeds of pulses have been produced during 2023 in participatory mode.

Enhancing Farmer's Income

The network project "New Extension Methodology and Approach-DFI" is implemented by involving 11 ATARIs and nine ICAR Institutes. In transganetic plain region, the extension gap between demonstrated technology and farmer's practices ranged from -0.11 to 97.2 q/ha in field crops, 59.0 to 459.1 q/ha in horticultural crops, −0. 4 to 2.2 q/ha in commercial crops and 218.1 liter/ lactation in dairy animals. The positive impact of technological intervention caused higher area coverage, introduction of new crops and increase in numbers of animals in adopted and non-adopted villages with varying degrees in 2020-21 over 2016-17. While cereals recorded a decline in area in adopted and non-adopted villages, the pulses, vegetables recorded promising increase of 173.7 and 270.0 per cent in adopted villages and 41.9 per cent in oilseeds and 279.9 per cent in vegetables in non-adopted villages. The cattle population grew by 95.8 per cent and that of buffalo by 59.8 percent in adopted villages as compared to the growth of 12.2 and 21.5 per cent in non-adopted villages. The increase in cropped area under pulses was 173.7 and 184.9 per cent, and was 270.0 and 119.6 per cent in vegetables in adopted and non-adopted villages, respectively in 2020-21. These findings indicate that technological interventions have positively influenced agricultural practices, leading to diversification in crop cultivation and an increase in livestock numbers. The significant growth observed in pulses and vegetable cultivation suggests a shift towards high-value crops, potentially contributing to enhanced farm incomes. Moreover, the substantial increase in livestock population in adopted villages reflects improved animal husbandry practices, which could further augment farmers' livelihoods. Among the intervention undertaken in different agriculture and allied sector, the highest average net income of the household of 208 per cent increased with supplementary enterprises followed by 190 per cent with horticulture, 171 per cent with livestock and 115 per cent with field crops over the base year in adopted villages. The income in non-adopted villages for corresponding sectors was 100, -4.0, 87.7 and 51.7 per cent, respectively. The income of small farmers increased by 2.46 times and that of marginal, medium and large land holders by 2.29, 2.11 and 2.10 times, respectively with the technological intervention by frontline extension institutions and agencies and its adoption by the farmers. The growth in employment by 1.21 times in adopted villages also signifies the positive role of extension system in motivating farmers to engage better in diversified employment and income augmenting on-farm and off-farm activities.

Outscaling of Natural Farming

Out scaling of natural farming project implemented by 38 KVKs in Rajasthan, Haryana and Delhi. During 2023, total of 1163 awareness programmes and 60 training programmes were conducted which was attended by 87093 and 2453 farmers respectively. Total 787 demonstrations were conducted on 298.3 ha area. They major crops grown with natural farming practices and protocols are wheat, moth, pearl millet, mustard, chickpea, green gram, barley, cumin, turmeric, ashwagandha, aonla, citrus, tomato, brinjal, okra, chili, in Rajasthan; chickpea, linseed, wheat, maize, paddy, barley, sugarcane, mustard, moong, cotton, gram, mango, banana, ber, sweet potato, tomato, cucurbits, onion, carrot, radish etc. in Haryana; and wheat, gram, bottle gourd, etc. in Delhi. The farmers given positive feedback on water holding capacity and soil health improvement, reduction in cost of cultivation by 12-45% in natural farming. Natural farming produce reportedly fetched better price to farmers.

Climate Resilient Technologies

Climate Resilient technologies demonstrated by 18 KVKs of Zone-II under Technology Demonstration Components of NICRA. Total 24532 farmers participated under various modules (NRM-871, crop production-2824, livestock and fodder production-1377,

institutional interventions including custom hiring - 2151, capacity building-5366, extension activities-11943). A revenue of Rs 200171.0 earned by CHC which benefited 2151 farmers and covered 2229 ha area.

Farmers First and ARYA

Farmer FIRST Programme was implemented by 12 centres involving ICAR institutes and SAUs of Delhi, Haryana and Rajasthan. The activities included 6 demonstrations covering 1086 farmers in horticulture, 21 demonstrations covering 2380 farmers in crop-based module, 14 demonstrations covering 8850 number of animals and 2996 farm families in livestock and fodder-based module. Under IFS Module, 4 units established involving 187 partner farmers. Total 26 capacity building programmes organized in which 1378 farmers and farm women participated. Overall, 62 participatory demonstrations were conducted under different modules involving 7869 practicing farmers and farm families. Under ARYA, 86 youths were trained of which 30 established their enterprises units.

Agri-Drone

Total 32 drones were assigned to 25 institutions in Rajasthan and Haryana (10 KVKs, 11 ICAR institutes, and 4 SAUs). Total 32 drones have been purchased and 27 drone pilots have undergone trainings. Total 2289 field demonstrations on application of pesticides etc have been conducted covering 2816 ha area with the participation of 83660 farmers.

Application of ICT

Kisan Sarathi a joint initiative of ICAR & Digital India Corporation, Ministry of Electronics and Information Technology, Govt. of India. So far 66 KVKs of Zone-II are registered on Kisan Sarathi portal. Since its inception in March 2022 total 3,671,687 farmers have been registered by KVKs of Zone-II on *Kisan Sarathi* Portal.

Collaboration and Convergence

ICAR-ATARI has been closely working with DAFW; M/o Fisheries, Animal Husbandry & Dairying, Ministry of Jalshakti, NITI Aayog, MoFPI MSME, IMD, WCD, MANAGE, International Crop Research Institute for Semi-Arid Tropics, Indian Farmers Fertilizers Cooperatives, All India Radio, National Cooperative Development Corporation. Under ICAR-Industry interface, ICAR-ATARI is working with Bayer, Dhanuka, Amazon, Barmer Lignite Company Ltd, Ultra tech Cement (Birla Group), Shiv Kisan Farmers Producers Company, Balotara. ICAR-ATARI, Jodhpur entered into a MoU with Agricultural University, Jodhpur for the promotion of research, education and extension activities

National and Regional Campaigns

Vikshit Bharat Sankalp Yatra was undertaken in all the Gram Panchayats of Rajasthan, Haryana and Delhi during September 2023 to 25 January 2024. The KVKs created awareness about soil health, organic farming, natural farming, sustainable agriculture and climate resilient technologies. All the 66 KVKs took active part in VBSY and delivered 5951 lectures, carried out campaigns covering total 6471 Gram Panchayats and 3030564 farmers.

Resource Generation and Revolving Funds

Mobilised Rs. 880 Lakh from Barmer Lignite Mining Co. Ltd for KVK, Barmer-II for improving income of rural households through training and demonstration by KVKs. CSR funding of Rs. 98.54 lakh to KVK, Karnal by AIC of India Limited, New Delhi. Discussions with Ultratech and Ambuja Cement held for CSR Funding. Mapping of other Industries/Corporates to seek funding under CSR. Total revolving funds of Rs. 1373 lakh generated by KVKs in 2023 against Rs. 1147 lakh in 2022. Rs 566.69 lakh generated from sponsored and externally funded projects.

New Infrastructure Developed

During 2023, Rs 388.25 lakh were provided to complete the ongoing infrastructure of new KVKs. Administrative Buildings of three KVKs at Jalore-II, Pali-II and Sikar-II has been constructed. Besides,

farmers hostels at KVK Bhilwara-II, Jaipur-II, Jalore-II, Pali-II, Pratapgarh, Sikar-II and Udaipur-II have been completed. The mobility has been improved in 9 KVKs through new vehicles amounting to Rs. 78.32 lakhs.

Products Commercialised and Group Activities

During 2023, the KVKs of Zone-II promoted more than 150 products. The products of millets, honey, custard apple, jamun, roses, milk products, aonla, ber, mango, pickles, jam, jelly, candy, etc were promoted. One GI based product of sojat mehndi prepared by KVK, Pali-II. Besides, products of Abu Saunf of Sirhohi and Nagauri Pan Methi has also been prepared and marketed. Six KVKs in the Zone are functioning as CBBOs of FPOs. Besides, KVKs provided technical backstopping to more than 104 FPOs/SHGs and JLGs for business promotion and backward and forward linkages.

Models/Extension Approach

Three extension approach tried by KVKs which are Kisan Paramarsh Kaksh (KPK) to address farmers' problems by KVK Churu-I; Urea Molasses Multi-nutrient Block (UMMB) production technology -group and mass mobilization by KVK Jaipur-I and Promoting quality seed production enterprise among farmers by KVK Hisar.

Governance and Recognition

Annual work plan of KVKs was finalised in the meetings held on 10-11 January 2023 for KVKs of Rajasthan and 18 January 2023 for Haryana and Delhi. Annual Zonal Workshop was organized on 19-21 June, 2023 at AU, Jodhpur, Rajasthan under the Chairmanship of Deputy Director General, (AE), ICAR. The RAC meeting of ATARIs was held on 5-6 August, 2023 at Bengaluru. The 13th and 14th Institute Management Committee meetings were held on 24th July, 2023 and 15th November, 2023. Total 9 billionaire farmers and 67 millionaire of Zone-II were nominated for recognition by Krishi Jagaran Group.

CHAPTER 1

ICAR-ATARI - An Introduction

ICAR-Agricultural Technology Application Research Institute (ATARI)-Zone-II, Jodhpur catering to needs of 66 KVKs for fund and finance management, research & extension coordination and monitoring in the states of Delhi, Haryana and Rajasthan is functioning under overarching governance of Division of Agricultural Extension of Indian Council of Agricultural Research (ICAR), New Delhi.

1.1 Genesis of ICAR-ATARI

During the ICAR's Golden Jubilee year in 1979, eight Zonal Coordinating were established in September, 1979 to monitor and coordinate Lab to Land Programme (LLP) launched in 1979. The Zonal Coordinating Units, Zone-VI consisting of KVKs of Rajasthan, Gujarat and UTs Daman & Diu and Dadra & Nagar Haveli was established at Ahmedabad in 1979 and shifted to Jodhpur in September 1991. The Zone-VI aimed at addressing agricultural extension of hot, arid and semi-arid regions. The zonal coordinating units were converted into a plan scheme with additional staff in 1986 and additional objective of monitoring other Transfer of Technology (ToT) project of ICAR i.e., Krishi Vigyan Kendra, Trainers Training Centre (TTC), National Demonstration Scheme (NDS), Operational Research Project (ORP), Scheduled Caste and Schedule Tribe Project and Special Project on Oilseeds. In 1990-91, implementation and monitoring of pulses of Technology Mission on Oilseeds & Pulses National was added. The Zonal Coordinating Units were elevated to Zonal Project Directorates and Zonal Coordinators redesignated as Zonal Project Directors with financial and administrative powers akin to other ICAR institutes in 2009. These Zonal Project Directorates were further elevated into ICAR-Agricultural Technology Application Research Institute (ATARI) in 2015. The Zone VI was also re-delineated as Zone-II with the addition of Haryana and Delhi replacing Gujarat, Daman & Diu and Dadra & Nagar Haveli which have been included under newly created ATARI-Zone-VI headquartered at Pune.

Mandate of ATARI

- Coordination and monitoring of technology application and front-line extension programs.
- Strengthening of agricultural extension research and knowledge management

1.2 Organizational Structure of ICAR-ATARI

The organizational structure of ICAR-ATARI, Zone-II, Jodhpur and KVK functioning in Zone is depicted in Fig 1.1.

1.3 KVKs functioning under ICAR-ATARI, Jodhpur

Total of 66 KVKs are functioning under ICAR-ATARI, Jodhpur, 47 KVKs in Rajasthan, 18 KVKs in Haryana and one KVK in Delhi (Table 1.1). There have been 14 large districts in Rajasthan which have 2 KVKs. However, after reorganization of districts in Rajasthan, 17 new districts have been notified in 2023 and many of new districts are now unrepresented by KVKs. In Haryana, three new KVKs have been proposed in Nuh, Charkhi-Dadri and Palwal which are under advance stage of approvals.

Fig 1.1 Organizational structure of ICAR-ATARI, Zone-VI, Jodhpur

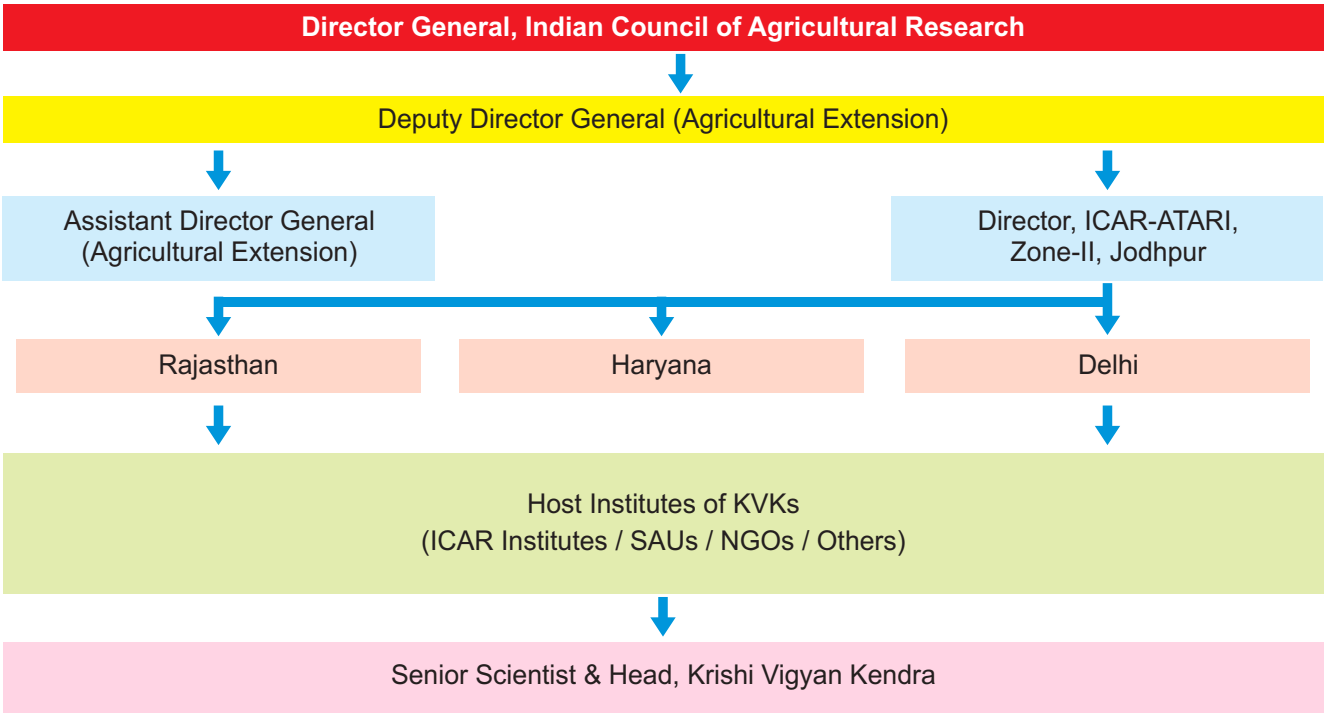


Table 1.1 KVKs functioning under ICAR-ATARI, Jodhpur

State	Number of KVKs	Host Organization-wise KVKs				Total
		SAUs	NGOs	ICAR	Educational Institutions/ Others	
Rajasthan	47	38	4	3	2	47
Haryana	18	14	2	2	0	18
Delhi	1	0	0	0	1	1
Total	**66**	**52**	**6**	**5**	**3**	**66**

1.4 National and Regional Campaigns

1.4.1 Viksit Bharat Sankalp Yatra (VBSY)

Hon'ble Prime Minister launched nationwide Viksit Bharat Sankalp Yatra (VBSY) on 15th November, 2023 to create awareness amongst masses about the welfare schemes and enhance their reach through doorstep approach. All the departments including agriculture involved in the VBSY for reaching out to all the Panchayats and villages. The KVKs took a lead role in VBSY for dissemination of sustainable agricultural practices such as organic farming and natural farming, soil health management and water management and climate resilient technologies, etc. The KVKs of Zone-II (Rajasthan, Haryana and Delhi) intensively involved themselves in the districts and reached to 3266 Gram Panchayats (GPs). The subject matter specialists (SMSs) delivered 3136 lectures on the most important topical issues including soil health and natural farming focusing on promising technologies. Direct participation of 1175232 farmers and other stakeholders happened in

the stalls of KVKs at various GPs. A large number of public leaders in Haryana, Rajasthan and Delhi and progressive farmers, entrepreneurs, representatives of women self-help groups participated in the VBSY.

VBSY – KVK, Delhi


VBSY – KVK, Barmer-II


VBSY – KVK, Gurugram

1.4.2 Farmers Registration on Kisan Sarathi

Kisan Sarathi (System of Agri-information Resources Auto-transmission and Technology Hub Interface) is joint initiative of Indian Council of Agricultural Research (ICAR) & Digital India Corporation, Ministry of Electronics and Information Technology (MeitY), Govt. of India and is powered by Interactive Information Dissemination System (IIDS). It is an ICT based intelligent online platform for supporting agriculture at local niche with national perspective. It is intended to provide a seamless, multimedia, multi-ways connectivity to the farmers with the latest agricultural technologies, knowledge base and the pool of large number the subject matter experts. All the 66 KVKs of Zone-II are registered on Kisan Sarathi portal. Each KVKs was initially given task of registering 5000 farmers of the district on Kisan Sarathi portal. Since its inception in March 2022 total 36,71,687 farmers under Zone-II have been registered by KVKs on Kisan Sarathi Portal. Through Kisan Sarathi KVKs can cater location specific problems of their farmers by using the IIDS system.

1.5 Workshops/Seminar/Symposium, etc Organized

Table 1.2 Workshops/Seminar/Symposium

S.No.	Name of the Event	Venue	Duration	Participants
A	**Themes of Meetings in Hybrid and Virtual Mode**			
1.	Special Research Studies	ICAR-ATARI, Jodhpur	11.04.2023	ICAR-ATARI Scientists, Representatives of ICAR Hq and SAUs, DEEs, Heads of KVKs and SMSs of KVKs
2.	Targets Identification of Technologies led Approaches and Kisan Sarthi	ICAR-ATARI, Jodhpur	30.04.2023	ICAR-ATARI Scientists, Representatives of SAUs, DEEs, Heads and SMSs of KVKs
3.	Miscellaneous matters of KVKs	ICAR-ATARI, Jodhpur	15.05.2023	ICAR-ATARI Scientists, Representatives of DEEs, Heads and SMSs of KVKs
4.	Mission LIFE Initiatives	ICAR-ATARI, Jodhpur	22.05.2023	ICAR-ATARI Scientists, Representative of DEEs, Heads and SMSs of KVKs
5.	Format for Zonal Review Meeting and APR 2022	ICAR-ATARI, Jodhpur	30.05.2023	ICAR-ATARI Scientists, DEEs, Heads and SMSs of KVKs
6.	FAO Project	ICAR-ATARI, Jodhpur	31.05.2023	ICAR-ATARI Scientists, Representatives of DEEs, Heads and SMSs of KVKs

S.No.	Name of the Event	Venue	Duration	Participants
7.	Annual Progress Report-2022	ICAR-ATARI, Jodhpur	26.06.2023	ICAR-ATARI Scientists, Representatives of DEEs, Heads of KVKs and SMSs of KVKs
8.	ICAR Foundation Day Celebration	ICAR-ATARI, Jodhpur	13.07.2023	ICAR-ATARI Scientists, Representatives of DEEs, Heads and SMSs of KVKs
9.	XIII Institute Management Committee	ICAR-ATARI, Jodhpur	24.07.2023	IMC Members and ATARI staff
10.	Mobilizing farmers for PM KISAN programme at NASC Complex, New Delhi	ICAR-ATARI, Jodhpur	25.07.2023	ICAR-ATARI Scientists, Representatives of SAUs/ DEEs, Heads and SMSs of KVKs
11.	Review Meeting on DFI Network Project	ICAR-ATARI, Jodhpur	02.08.2023	ICAR-ATARI Scientists, Representatives of SAUs, DEEs, Heads and SMSs of KVKs
12.	preparation of CRM activities	ICAR-ATARI, Jodhpur	05.09.2023	ICAR-ATARI Scientists, DEE of CCSHAU, Hisar, Heads and SMSs of 15 KVKs implementing CRM Project
13.	Administrative and Finance Matters	ICAR-ATARI, Jodhpur	15.09.2023	ICAR-ATARI Scientists, AF&AO, AAO, DEEs Representatives, Heads and SMSs of KVKs
14.	Mid-Term Review of Farmers First Project of Zone-II	ICAR-ATARI, Jodhpur	18.10.2023	ICAR-ATARI Scientists, Representatives of SAUs/ ICAR Institutes implementing FFP
15.	Sensitization on Microbial based waste management using Vermicomposting	ICAR-ATARI, Jodhpur	16.102023	ICAR-ATARI Scientists, Representatives of SAUs/ DEEs, Heads and SMSs of KVKs
16.	National Workshop on Anthrophonic Science vis a vis Food Security	ICAR-ATARI, Jodhpur	20-21 October, 2023	ICAR-ATARI Scientists, Representatives of KVKs, ICAR Institutes, BHU, ADG (AE), ICAR
17.	Information on mustard Farmers Questionnaire	ICAR-ATARI, Jodhpur	25.10.2023	ICAR-ATARI Scientists, SMSs and Sr Scientist & Head of KVKs implementing CFLD-Oilseeds
18.	Regional Committee Exhibition	ICAR-ATARI, Jodhpur	31.10.2023	ICAR-ATARI, Jodhpur Scientists and CAZRI, Jodhpur
19.	Vikshit Bharat Sankalp Yatra for KVKs of Haryana	ICAR-ATARI, Jodhpur	14.11.2023	ICAR-ATARI Scientists, SMSs and Sr Scientist & Head of KVKs of Haryana
20.	XIV IMC meeting of ICAR-ATARI, Zone-II, Jodhpur	ICAR-ATARI, Jodhpur	15.11.2023	IMC Members, AF&AO and other ICAR-ATARI staff
21.	Monthly Review Meeting of KVKs	ICAR-ATARI, Jodhpur	17.11.2023	ICAR-ATARI Scientists, Representatives of DEEs/DEEs of SAUs, Sr Scientists & Heads and SMSs of KVKs
22.	Vikshit Bharat Sankalp Yatra in Haryana and Delhi	ICAR-ATARI, Jodhpur	21.11.2023	ICAR-ATARI Scientists, Representatives of DEEs, SMSs and Heads of 19 KVKs
23.	Vikshit Bharat Sankalp Yatra Haryana, Rajasthan and Delhi	ICAR-ATARI, Jodhpur	29.11.2023	ICAR-ATARI Scientists, Representatives of DEEs, SMSs and Heads of KVKs
24.	Review-cum-Work Plan Work Shop of "Outscaling of Natural Farming through KVKs"	ICAR-ATARI, Jodhpur	06.07.12.2023	ICAR-ATARI Scientists, Representatives of DEEs, SMSs and Heads of 38 KVKs implementing Natural Faming

S.No.	Name of the Event	Venue	Duration	Participants
25.	Vikshit bharat Sankalp Yatra-Rajasthan State	ICAR-ATARI, Jodhpur	16.12.2023	ICAR-ATARI Scientists, Representatives of DEEs, SMSs and Heads of 47 KVKs
26.	Emerging Challenges in Pomegranate Production & Marketing	ICAR-ATARI, Jodhpur	29.12.2023	ICAR-ATARI Scientists, Representatives of DEEs, SMSs and Heads of 19 KVKs
B.	**Meetings in Physical Mode**			
1.	Annual Action Plan 2023 of KVKs of Rajasthan	ICAR-ATARI, Jodhpur	10-11 January, 2023	ICAR-ATARI Scientists, SMSs/Heads of 47 KVKs, DEEs of SAUs of Rajasthan
2.	Annual Action Plan 2023 of KVKs of Haryana and Delhi	ICAR-ATARI, Jodhpur	18 January, 2023	ICAR-ATARI Scientists, SMSs/Heads of 19 KVKs, DEE of CCSHAU, Hisar, Haryana
3.	Zonal Review Meeting of FFP project	ICAR-ATARI, Jodhpur	20.01.2023	SAUs and ICAR Institutes implementing FFP Project
4.	Outscaling Natural Farming through KVKs	ICAR-ATARI, Jodhpur	1-2 February, 2023	ICAR-ATARI Scientists, SMSs/Heads of 38 KVKs implementing Natural Farming, DEEs and their representatives
5.	Zonal Review Workshop NICRA-TDC	ICAR-ATARI, Jodhpur	23.02.2023	ICAR-ATARI Scientists, SMSs/Heads of 18 KVKs implementing NICRA in Haryana and Rajasthan
6.	Content Management System	ICAR-ATARI, Jodhpur	28.02.2023	ICAR-ATARI Scientists, SMSs/Heads of all 66 KVKs, DEEs of SAUs
7.	Annual Zonal Review Workshop of KVKs of Rajasthan, Haryana & Delhi	AU, Jodhpur	19-21, June, 2023	DDG(AE) and ADG(AE), ICAR, VC, AU, Jodhpur, DEEs of SAUs of Rajasthan and Haryana, ICAR-ATARI Scientists, SMSs/Heads of 66 KVKs
8.	Review Workshop of Outscaling of Natural Farming	ICAR-ATARI, Jodhpur	25-26 Sept., 2023	ICAR-ATARI Scientists, SMSs/Heads of 38 KVKs implementing Natural Farming, DEEs and their representatives
9.	Farmers FIRST Project	ICAR-ATARI, Jodhpur	18.10.2023	ICAR-ATARI Scientists, ICAR Institutes implementing FFP
10.	Rajbasha Pakhwada	ICAR-ATARI, Jodhpur	14-15 Sept., 2023	ICAR-ATARI Scientists, Administrative and Finance and Project Staff of ICAR-ATARI, Jodhpur
11.	DFI Network project – Impact Assessment of selected intervention by KVKs	ICAR-ATARI, Jodhpur	15.09.2023	ICAR-ATARI Scientists, SMSs and Sr Scientist & Head of all 66 KVKs

Annual Action Plan Workshop for KVKs of Haryana & Delhi on 18.01.2023 at ATARI Jodhpur

Annual Zonal Review Workshop of KVKs of Rajasthan, Haryana and Delhi at AU, Jodhpur during 19-21 June, 2023

Institute Management Committee held on 15.11.2023

1.6 Budgetary Support

The funds received from different sources and utilized by ICAR-ATARI and KVKs of the Zone-II is summarized in the Table 1.3. The total funds received was Rs. 11477.99 lakh of which Rs. 11438.14 lakh was utilized.

Table 1.3 Fund allocation & utilization at ATARI, DEEs and KVKs for the year 2023-24 (Rs. lakhs)

S.No.	Scheme/projects	Allocation	Expenditure
1.	ATARI, Jodhpur	407.17	407.17
2.	KVK	9924.30	9924.30
3.	NICRA	180.94	180.94
4.	ARYA	39.75	39.75
5.	Farmers First Programme	118.50	118.50
6.	Swachta Action Plan	20.00	16.92
7.	New Extension Methodologies in Agriculture(NEMA)	4.41	4.41
8.	Cluster FLD on Pulses under NFSM	130.97	130.50
9.	Cluster FLD on Oilseed under NMOOP	152.15	152.14
10.	Crop Residue Management	209.61	21.04
11.	District Agromet Units (DAMUs)	290.19	290.19
12.	Cereal Systems Initiative for South Asia (CSISA)	0.00	0.00
	Total	**11477.99**	**11438.14**

1.7 Staff strength at ICAR-ATARI, Jodhpur

The sanctioned staff strength of ATARI, Zone-II, Jodhpur is 18, out of which 12 are filled up (Table 1.4) and the scientific, technical, administrative, finance and other staff in place are presented in Table 1.5.

Table 1.4 Staff strength at ICAR-ATARI, Jodhpur as on 31.12.2023

S.No.	Post/Designation	Sanctioned	Filled	Vacant
1.	Director	1	1	0
2.	Principal Scientist	1	1	0
3.	Senior Scientist (Livestock Production & Management)	1	1	0
4.	Senior Scientist (Agricultural Economics)	1	0	1
5.	Senior Scientist (Vegetable Science)	1	1	0
6.	Scientist (Agricultural Extension)	1	1	0
7.	Scientist (Agronomy)	1	1	0
8.	Senior Technical Officer (Computer)	1	1	0
9.	Assistant Finance & Accounts Officer	1	1	0
10.	Assistant Administrative Officer	1	0	1

S.No.	Post/Designation	Sanctioned	Filled	Vacant
12.	Assistant	2	1	1
13.	Private Secretary	1	0	1
14.	Senior Clerk	1	1	0
15.	Junior Clerk	2	1	1
16.	Driver	1	1	0
17.	Skill Support Staff	1	0	1
	Total	**18**	**12**	**6**

Table 1.5 Staff Position existing on 31.12.2023

Category	Name of staff	Designation
Director	Dr. Jai Prakash Mishra	Director
Scientific	Dr. P. P. Rohilla	Principal Scientist (LPM)
	Dr. B. L. Jangid	Principal Scientist (Agril. Extn.)
	Dr. M. S. Meena	Principal Scientist (Agril. Extn.)
	Dr. Raj Narayan	Principal Scientist (Vegetable Science)
	Dr. H. N. Meena	Senior Scientist (Agronomy)
Technical	Sh. P. K. Satapathy	Chief Technical Officer
	Sr. Ram Niwas	Driver
Administrative	Sh. Prakash Vimal	Assistant Finance & Accounts Officer
	Sh. Rajendra Benda	Assistant
	Sh. Mukesh Tripathi	UDC
	Smt. Nishtha	LDC

1.8 Staff strength at KVKs

Total sanctioned position in 66 KVKs is 1056 against which 585 are in position as on 31.12.2023 which included 44 Sr Scientist & Head and 233subject matter specialists. About 44.6% positions are still vacant for which attempts have been initiated by SAUs to fill the posts. The details are presented in Table 1.6.

Table 1.6 Summary of KVK staff position

Category	Rajasthan			Haryana			Delhi			Total		
	S	F	V	S	F	V	S	F	V	S	F	V
Senior Scientist & Head	47	30	17	18	13	5	1	1	0	66	44	22
Subject Matter Specialist	282	138	144	108	90	18	6	5	1	396	233	163
Programme Assistant	141	73	68	54	29	25	3	3	0	198	105	93
Administrative	94	39	55	36	20	16	2	2	0	132	61	71
Auxiliary	94	57	37	36	25	11	2	2	0	132	84	48
Supporting	94	45	49	36	13	23	2	0	2	132	58	74
Total	**752**	**382**	**370**	**288**	**190**	**98**	**16**	**13**	**3**	**1056**	**585**	**471**

1.9 Transfers/Promotions/Joining, etc.

- Dr. S. K. Singh, ex-Director, ICAR-ATARI, Jodhpur was relieved on 19.02.2023 to join ICAR-ATARI, Kanpur.
- Dr. J. P. Mishra joined as Director, ICAR-ATARI, Jodhpur w.e.f. 20.02.2023.
- Sh. Om Prakash Jayal, AAO, ICAR-ATARI, Jodhpur was promoted as AO and relieved to ICAR-CAZRI, Jodhpur on 29.12.2023.

CHAPTER 2

Rainfall Pattern and Drought Mitigation

Zone II comprised of Rajasthan, Haryana and Delhi. While larger part of Haryana and Delhi are assured irrigated, the large geographies in Rajasthan are rainfed. The crops and livestock often experience stress due to prolong dry spells during monsoon season. The droughts are common and frequently occurring phenomena in the State. Figure 2.1 depicts the normal and actual rainfall in Rajasthan, Haryana and Delhi received during 2023. The figure indicates normal rainfall in Rajasthan, Haryana and Delhi with positive deviation towards surplus by 29.80 % in Rajasthan and 6.90 % in Haryana and Delhi. However, a prolong dry spell of almost 42 days during July and August, 2023 caused damage to crops especially mung bean, mothbean, bajra and groundnut in Rajasthan.

Rainfall Pattern in Rajasthan and Haryana during 2023

The annual rainfall in Rajasthan and Haryana during 2023 is given in Table 2.1. On the whole Rajasthan and Haryana received excess rainfall.

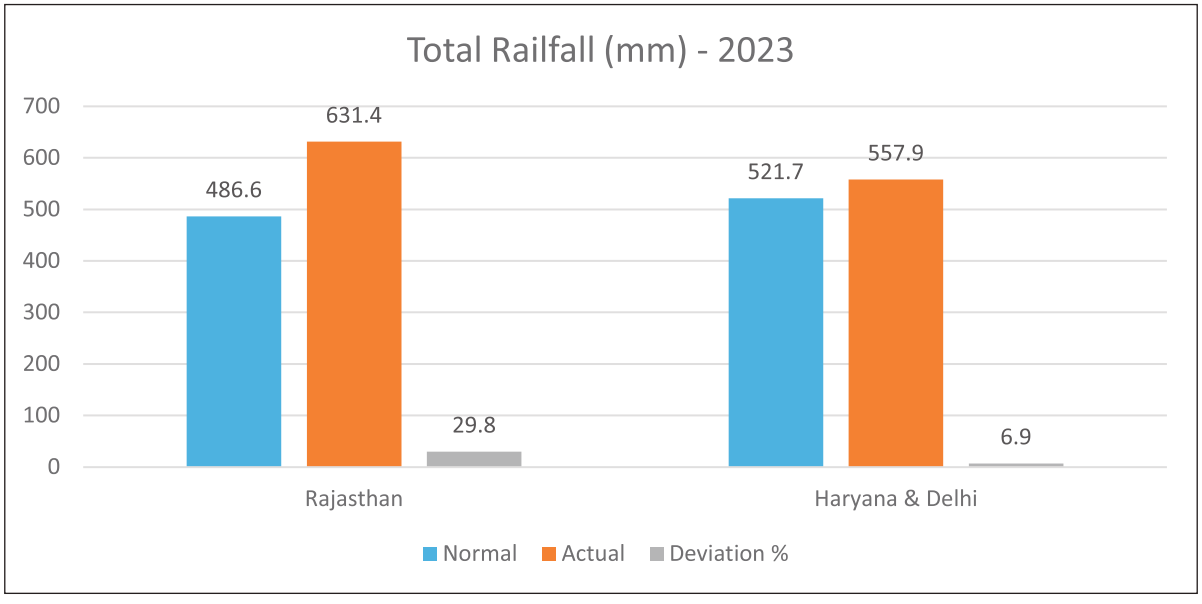


Fig. 2.1 Actual rainfall during 2023 and normal rainfall in Rajasthan, Haryana & Delhi

Table 2.1. Annual Rainfall in mm during 2023 (Jan to Dec) in Rajasthan, Haryana & Delhi

State	Normal	Actual	Departure from Normal%
Rajasthan	486.60	631.40	+29.80 %
Haryana	521.70	557.90	+6.90 %

Intervention

Promotion of Climate Resilient Varieties: The climate resilient varieties of bajra, green gram, blackgram, mothbean, clusterbean, groundnut, wheat, mustard and other field crops and horticultural crops were popularized and promoted by KVKs. The climate resilient varieties of field and horticultural crops were demonstrated by 18 KVKs in Rajasthan and Haryana at farmers' fields.

Rainwater harvesting, Efficient Water Application Tools: *In-situ* rain water conservation and ex-situ water harvesting along with use of efficient water application techniques and tools are the key interventions for drought proofing in these States. KVKs under Zone-II imparted trainings and skills with the farmers to enhance their awareness and knowledge on water conservation, harvesting and efficient recycling for maximum use efficiency under stressed conditions. Altogether, 19 KVKs conducted 46 trainings with the participation of 1426 farmers including 369 female farmers. Of the total participants, 567 were SC/ST farmers which included 198 female SC/ST farmers. The state-wise details are given in Table 2.2.

Table 2.2 Trainings on rainwater harvesting and efficient water application system

State	No. of KVK	No. of Courses	No. of Participants including SC/ST			No. of SC/ST Participants		
			Male	Female	Total	Male	Female	Total
Rajasthan	15	32	765	266	1031	282	141	423
Haryana	4	14	262	133	395	87	57	144
Total	**19**	**46**	**1027**	**399**	**1429**	**369**	**198**	**567**

Soil Water and Plant Analysis

Soil and water testing laboratories have been established in total 66 KVKs and all the 66 KVKs had analyzed soil and water samples for enhancing the soil conditions and proper utilization of water. The soil and water analysis is also used for recommendations to the farmers about nutrient application based on soil test for conducting OFTs and FLDs, suitability of water for irrigation and advisories to the farmers. During the year, 28820 samples, comprising of 17134 soil, 7744 water and 3932 plants were received from 22104 farmers of 1674 villages, were analyzed. A revenue of Rs. 8.49 lakh was also generated by KVKs through this activity.

Table 2.3 Analysis of soil, water and plant samples by KVKs of Zone-II during 2023

State	Samples	No. of samples	No. of Farmers	No. of villages	Amount realized (Rs.)
Rajasthan Total	Soil	12536	9950	983	662002
	Water	5672	4874	693	85758
	Plant	2168	860	58	38360
	Manure	0	0	0	0
	Total	**20376**	**15684**	**1734**	**786120**
Haryana & Delhi	Soil	4598	3282	691	44915
	Water	2072	1778	712	18252
	Plant	1764	1650	435	0
	Manure	10	10	10	0
	Total	**8444**	**6720**	**1848**	**63167**

State	Samples	No. of samples	No. of Farmers	No. of villages	Amount realized (Rs.)
Zone Total	Soil	17134	13232	1674	706917
	Water	7744	6652	1405	104010
	Plant	3932	2510	493	38360
	Manure	10	10	10	0
	Total	**28820**	**22404**	**3582**	**849287**

Method demonstration on Soil sample collection by KVK – Churu-I

CHAPTER 3

Research Achievements, Collaborative and Sponsored Projects

The significant achievements of various ICAR network projects, and sponsored projects are summarized in this chapter. The major projects implemented during 2023 included ARYA, FFP, NEMA-DFI, NICRA-TDP, TSP, SCSP, CRM, Natural Farming, Agri-Drone and DAMU, etc.

3.1 Attracting and Retaining Youth in Agriculture

Indian Council of Agricultural Research (ICAR) launched the *Attracting and Retaining Youth in Agriculture* (ARYA) program in 2015-16 to develop a comprehensive model for the holistic development of rural youth, with a specific focus on those engaged in agriculture. The primary objective was to identify and empower 200 rural youths in each district, nurturing their entrepreneurial skills and facilitating the establishment of micro-enterprises. ICAR-ATARI and KVKs collaborated closely with SAUs and ICAR institutes, serving as valuable technology partners. One or two enterprise units were established at KVK also to serve as training centers for aspiring youth. During 2018-19, the project was expanded to 100 KVKs. In zone-II, ARYA has been implemented in 10 districts of Rajasthan and Haryana viz., Alwar, Banswara, Barmer, Bundi, Jaipur, Jhalawar, Udaipur, Ambala, Gurugram, and Mahendergarh.

During 2023-24, 4 skilled training have been organised by KVK, Alwar-I (Goatery), Jhalawar (Protected cultivation) and Ambala (Mushroom cultivation and nursery management), in which 86 rural youth have been trained. Trainings included theory-based lectures, method demonstrations, and hands-on-learning. In addition to trainings, exposure visits to the successful enterprises were organised for the mutual learning. Out of 86 trained youth, 30 youth (35%) have established their own enterprise.

3.2 Assessment of KVKs intervention in Doubling Farmer's Income

The study was conducted involving 20 farmers each from 364 adopted villages and corresponding numbers from 364 non-adopted villages. Total 7280 farmers of adopted villages and 7280 farmers of non-adopted villages were studied for analyzing the impact of KVKs interventions in enhancing the income of the farmers during 2016-17 to 2020-21 period. The sdudy was undertaken in 44 adopted and 44 non adopted villages, 16 from Hrayana and 28 from Rajasthan The positive contribution of different agriculture components in farm income was noticed. The farm income of the household increased in the range of 208.1% to 100% through subsidiary agriculture interventions in adopted and non-adopted villages, respectively under Trans Gangetic Plan Agro-climatic Region(TGACR) followed by 145.1, 99.2 and 98.9% through livestock, field, and horticultural crops interventions. The total farm income in adopted villages increased by 111.4% in TGACR against 36.7% in non-adopted villages. The subsidiary enterprises registered the highest of 586.5 % increase during 2016-2021 adopted villages under Central Plateau & Hills Agro-climatic Region (CPHACR) during 2020-21. In livestock the income increase was 235.6 and 116.3% in adopted and non-adopted villages over the baseline year. Under Western Dry Agro-climatic Region (WDACR), the total farm income increased by 104.1 and 67.7 % in adopted and non-adopted villages. Farmers of all classes of land holding are benefitted from the technological interventions of the KVKs during 2016-17 to 2020-21 in all the regions. The household income of all categories of landholders increased during 2020-21 in adopted villages in varying degrees under TGACR, CPHACR and WDACR. The involvement of manpower of different

land class categories in agricultural and allied activities increased in adopted villages, while it is decreased in non-adopted villages, except in the case of small and medium landholders. The engagement of landless farm men decreased in non-adopted villages, which may be due to migration into non-farm services sectors. Likewise, the maximum increase of 254.2 and 178.7% in man-days involvement of landless farmers in agriculture and allied sectors in adopted villages of TGACR and CPHACR Haryana and Rajasthan, respectively was noticed which reduced in all classes of landholders in WDACR of Rajasthan Overall, the average net income increased by over 2 times in 2020-21 as compared to income of farmers households in study area in 2016-17. The net income of marginal farmers increased the most amongst all categories of farmers. Field crops, fruits and vegetables, livestock rearing, high value commodities and on-farm and off-farm enterprises in the rural areas contributed remarkably towards augmenting the income of the farmers. The positive contribution of different components was recorded at both the adopted and non-adopted villages.

3.3 *In-situ* Management of Crop Residue in Haryana and NCT of Delhi

Rice-wheat is the predominant cropping system of Haryana accounting 58% of cultivated land. The rice acreage is around 1.21 million ha. The burning of rice residue is a common practice in this system of cropping for an early sowing of wheat. The estimates show that burning one tonne of paddy straw leads to loss of about 5.5 kg N, 2.3 kg P_2O_5, 25 kg K_2O, 1.2 kg sulphur (S), along with 50-70% loss of micronutrients contained in rice straw. Besides, it releases 400 kg carbon, 3 kg particulate matter, 60 kg CO, 1460 kg CO_2, 199 kg ash, and 2 SO_2. To address this problem through icorporation of crop residue in-situ a Centrally Sponsored Scheme "Promotion of Agricultural Mechanization for In-situ Management of Crop Residue in the States of Punjab, Haryana, Uttar Pradesh, and the NCTof Delhi, was launched in 2018. Under the scheme, Information, Education, and Communication (IEC) has been implemented by 60 KVKs of Punjab, Haryana, Delhi and UP.

Information, Education, and Communication (IEC)

Total 20542 farmers of Haryana and Delhi were benefited from KVKs' awareness camps (194) organized at the district, block, and village/panchayat levels. The articles in newspapers and magazines (92) hoardings (73), wall writings (65), posters (284) and publicity material (29878) were distributed. 6 Kisan Melas were organised in Haryana and Delhi. Around 5107 farmers from selected and nearby villages attended and benefited from live demonstrations of machinery used in crop residue management after rice harvest. Different KVKs in Haryana and Delhi selected 53 schools and colleges to mobilize students through an essay competition, painting, debate, and other activities. Approximately (5556) students raised awareness of in-situ crop residue management. KVKs conducted 2452 demonstrations in their respective districts of Haryana and Delhi, covering 1849.01 ha and 2337 farmers. KVKs organized five-day training of farmers in collaboration with a state agriculture department. Total 14 trainings were organized and 344 farmers were trained. 14 exposure visits were organized benefiting 1055 farmers and 4 field/harvest days organised in identified villages benefiting 225 farmers. Total 9 webinars1 were also organised involving 1535 farmers.

Productivity and Income of Farmers The average grain yield of wheat of 51.46 q/ha was recorded under CRM methods against 48.04 q/ha under conventional tillage practice adopted by the farmers in Haryana and Delhi, a gain of 7.1% over conventional sowing methods. The saving in cost of cultivation was Rs. 2627/ha under CRM than conventional sowing methods. The total cost of cultivation was Rs. 38665/ha with CRM method as compared to 41292 with conventional methods. Consequently the net income was 18.8% higher under CRM methods (Rs. 80353/ha) than conventional method (Rs 67613/ha). Every rupee invested in CRM gave a return of Rs 3.02 as compared to Rs 2.64 under conventional methods.

Table 3.1 Grain yield of wheat under demonstration on CRM technology vs conventional method in Haryana and NCT Delhi

District/KVK	No. of demonstrations	Area under demonstration (ha)	Yield (q/ha)	
			CRM	Conventional
Bhiwani	375	151.82	53.85	46.31
Delhi	100	99.95	51.57	49.55
Fatehabad	250	101.21	53.72	52.88
Hisar	15	12.15	48.39	47.10
Jhajjar	150	151.82	45.57	45.25
Jind	250	101.21	54.14	49.25
Kaithal	189	153.04	53.77	50.64
Karnal	174	70.45	59.13	53.11
Kurukshetra	375	151.82	52.24	45.13
Panipat	250	101.21	50.46	48.71
Rohtak	250	101.21	39.74	37.77
Sonipat	250	101.21	48.41	42.83
Sirsa	150	101.21	51.15	49.97
Yamunanagar	250	101.21	58.29	54.09
		Average	**51.46**	**48.04**

3.4 Agri-Drone Project

Indian agriculture is typified as small holders and family farming with 80% of its total land divided into plots of less than 5 acres. In this context, modern technologies such as drones hold promise as a solution for farming, offering the potential to reduce labor and time burdens while generating substantial data for research, thereby facilitating the transition towards sustainable agriculture in the future. The agri-drone project has been initiated to improve efficiency and accuracy in the field operations and enhance crop yield while reduce the cost of cultivation

For the Agri-Drone project, ICAR, New Delhi has sanctioned funds to various State Agricultural Universities (SAUs), Krishi Vigyan Kendras (KVKs), and ICAR Institutions for the procurement of drones and conducting demonstrations during the financial year 2023-24. Under ICAR-ATARI Zone II, Jodhpur, 32 drones were distributed among 25 institutions (10 KVKs, 11 ICAR institutes, and 4 SAUs) in Rajasthan and Haryana. 51 Scientists/SMSs from these 25 institutes were selected for pilot training, for which a total sum of Rs. 1203000/- was allocated. So far all 32 drones have been purchased and 29 pilot have been trained. Total 2289 demonstrations on 2018,9 ha area involving 83660 farmers completed.

3.5 Scheduled Tribe Component

The progarmme was implemented by 24 KVKs of Rajasthan. Total 228 capacity building/skill development programme with participation of 6327 tribal farmer/farm women/youth were organised. Total 33 OFTs involving 226 tribal farmers 3645 FLDs involving 4922 tribal farmers were conducted. Production of 215.3 tonnes seed of field crops, 3,01,910 saplings/seedlings, 8,540 cutting, slips, suckers, etc done which were made available to 2899; 11,588 and 2,099 farmers, respectively. Besides, 799 units of pig, sheep, goat etc. were provided to 562 farmers; 16,991 poultry chicks benefitting 4,111 farmers,

and 12,00,000 fish spawns/fingerlings to 115 farmers. The farm implements of different types and capacities were provided to 1325 farmers on individual and community basis. Overall, under the TSP programme, 76941 tribal farmers were benefited during 2023.

3.6 Scheduled Caste Sub Plan (SCSP)

The SCSP was implemented in 15 districts (9 in Rajasthan and 6 in Haryana) under Zone-II. Total 220 capacity building/skill development activities with participation of 6906 SC farmers; 11 OFTs at 110 SC farmers fields and 3370 FLDs at 4954 SC farmers fields were organised. Seed of field crops of 35.14 tonnes, 2,56,029 numbers of seedlings/saplings 207000 cutting, slips, suckers, etc were produced and made available to 3119; 1097 and 151 farmers, respectively. Total 197 small animals (pig, sheep, goat etc.) benefitting 70 farmers 5895 chicks to 392 farmers, and 10,000 fish fingerlings to 10 farmers were provided. Total 1620 farmers were provided farm implements and machineries of different capacity. Promoted 27 agri-entrepreneurship benefitting 213 farmers and distributed 24344 literature amongst 20185 farmers. Altogether, 48855 SC farmers were involved and benefitted under various activities of SCCP in 2023.

3.7 National Innovations in Climate Resilient Agriculture (NICRA)

The Project has been implemented in 18 districts/KVKs of Rajasthan and Haryana. During 2023-24, 24532 farmers were involved under various components of technology demonstrations and institutional building (Table 3.2). Also earned a revenue of Rs 200171.0 through CHC which benefited 2151 farmers and covered 2229 ha area.

Table 3.2 Module-wise Summary of NICRA during 2023-24

Module	No. and area demos	No. of Partner Farmers		
		Male	Female	Total
NRM	871 (961.3 ha)	--	--	**871**
Crop Production	2824 (1043.3 ha)	--	--	**2824**
Livestock and Fisheries	1190 (3299 animals)	--	--	**1377**
Institutional Intervention	2151 (2229)	--	--	**2151**
Capacity Building	176	4063	1303	**5366**
Extension Activities	345	8854	3089	**11943**
	10040	**12917**	**4392**	**24532**

The Project has been implemented in 18 KVKs (Rajasthan & Haryana) under ICAR-ATARI, Zone-II, Jodhpur is involved in carrying out different activities under Technology Demonstration Components comprised of various modules under NICRA project. Under this project 23318 partner farmers (NRM-771, crop production-2638, livestock and fodder production-1194, institutional interventions including custom hiring -3085, capacity building-3239, extension activities-11922) were involved. Also earned a revenue of Rs 200171/-only through CHC which benefited 3083 farmers and covered 3440.5 ha area.

Under NRM interventions focus on water positive activities through water conservation, micro-irrigation, sprinkler and rain water harvesting; which resulted in 20 to 36 % water economy. Soil test based nutrient application, green manuring, crop residue based compost and crop residue incorporation resulted 22 to 28 % nitrogen saving. Overall these interventions improved crop yield by 12 to 35 per cent and net income augmentation recorded 16 to 38 percent.

Under crop module, short duration varieties of Clusterbean- RGC- 1066, HG-2-20, Pearlmillet-MPMH-17, Cowpea-RC-19, Chickpea GNG-214) Basmati Rice - PB-1509 covered 175 ha area and yield advantage observed 20 to 32.5 percent. Drought tolerant varieties on 452.5 ha area including barley RD-2849 and RD-2786, Clusterbean-RGC 1066, HG-2—02, mungbean-GM-07 and GAM-5, pearl millet- MPMH-17, HHB-67, HHB-299, mothbean- RMO-225-1, Raya- RH-725, chickpea-GNG-1581, cumin-GC-4 and cotton- RCH-776, Ankur-555, US-51, Ajit-155. Yield advantage ranged from 18.7 to 42 percent.

Rain Water harvesting : KVK Bhilwara

Demo om Mothbean : KVK Barmer

Field Day on Clusterbean : KVK Fatehabad

Demo on Sirohi Goat unit : KVK Jhunjhunu

Total 44 demonstrations on moisture stress management in Clusterbean- HG-2-20 over 18.0 ha area yield advantage varied from 16 to 22 percent. In 91 demonstrations on terminal heat stress management in wheat (Raj-4238, DBW-187, WH-1124) per cent increase in yield ranged from 18 to 24. Similarly, in integrated pest and disease management-cumin GC-4, isabgol RI-1, cotton RHC-926, guar HG-2-20 demonstrations the yield increase ranged from 16 to 37.5 percent. Inter-cropping system-green gram (MH-421)/pearl millet (RHB-173)-3:1 RR; maize (DHM-121)/black gram (PU-01) in 2: 2 RR in 36 demonstrations over 13.4ha area the percent increase in yield was recorded 18.3 to 36.5.

Under livestock demonstration on feed management of 749 animals (mitigate mineral deficiency) provided @ 50 to 100 g/d/animal resulted on an average increase of 18.5% in milk production. Deworming of 1912 animals recorded 14.7 to 22 percent increase in milk yield under field conditions; while vaccination of 924 animals for different diseases in various animal health camps organized resulted in 16.5 to 20 percent increase in milk production at village level.

3.8 Farmer FIRST Programme

Farmer FIRST Programme has been implemented at 12 partners ICAR institutes/SAUs under zone-II. Five modules viz. Natural Resource Management, Crop production, Horticulture, Livestock production and Integrated Farming System, in addition to various extension activities have been implemented. Under NRM a total of 196 demonstrations were conducted involving 414 number of farm families. A total of 1437 demonstrations were conducted covering 1723 number of farm families under Crop Based Modules. A total of 1350 demonstrations were conducted covering 1518 number of farm families under Horticulture Based Modules. A total of 6472 demonstrations were conducted covering 13760 number of animals among 6548 farm families under Livestock and Fodder Based Modules. Under Integrated Farming System Module, a total of 43 units were established involving 81 partner farmers. Different Extension Activities were performed through 131 programmes conducted under Farmer FIRST programme involving 6042 partner farmers and farm families all over the country. Overall, 9629 participatory demonstrations were conducted under different modules involving 16326 practicing farmers and farm families. The results of participatory demonstrations have shown superiority over traditional practices, productivity enhancement, income augmentation, increase of area under usable technologies, employment generation, etc. Adaptation of Climate Resilient technologies also helped in timely management of production and protection technologies and cost reduction. Farmers have accepted utility of mineral mixture on milk yield and general health of the animals. Average health of the animals was better than before feeding minerals to the mulch animals under field conditions in adopted villages.

Moongbean Crop :AU Jodhpur

Lemon orchard at FFP field Arnia village : CSWRI Avikanagar

Institute visit and famers interaction: CAZRI, Jodhpur

NRM Module : CCSHAU Hisar

3.9 KVKs as Cluster Based Business Organizations for FPO

Farmer Producer Organisations (FPOs) have emerged as powerful catalysts for change in India's agricultural landscape. FPOs address the challenge of economy of scale of smallholder farmers for access to market and price negotiation as well as facilitate in backward linkages for inputs. The Government launched the scheme Formation and Promotion of 10,000 FPOs, the Cluster Based Business Organizations (CBBOs) are an integral component of the scheme. Indian Council of Agricultural Research and Department of Agricultural Research & Farmers Welfare joined hands and kVKs were entrusted the responsibility of CBBOs. In zone-II, the scheme has been successfully implemented across 6 districts Jalore, Barmer, Sriganganagar, Ambala Fatehabad, and Rewari. ICAR-ATARI, Jodhpur, played a key role in assisting the six KVKs in Rajasthan and Haryana to form and register 13 FPOs. Each FPO has been dedicated to adopting One District One Product approach, focusing on product specialization for development. These FPOs have been entrusted for promoting aggregation and processing of onion, mustard, cumin, pomegranate, and know and also their branding, marketing and export.

Total 13 FPOs mobilized 3779 farmers. Board of Directors have been appointed, and equity grant of Rs. collected from members. KVKs organized training programmes for FPO members on seed production, value addition, marketing, etc.

3.10 Seed hubs pulses in Rajasthan & Haryana

Quality seed is one of the most critical components for ensuring higher yields. Replacing old varieties from seed chains and farmers' fields is major priority for research managers, extension workers and other stakeholders. Realizing the importance of quality seeds in enhancing the productivity of pulses, 'Creation of seed hubs for increasing indigenous production of pulses in India' was initiated during 2016 involving 7 ICAR institutes, 46 AICRP centres in SAUs and 97 KVKs for developing suitable infrastructure for seed quality enhancement, processing and safe storage to ensure the supply of quality seeds and maintain sustainability with profitability to the farmers locally. The interventions included participatory seed production, supply of breeder/foundation seed of greengram and blackgram, frequent monitoring, facilitation in seed certification, grading, packaging, branding, buy back. In zone-II, Seed hub project is being implementing by 8 KVKs (Jhunjhunu, Kota, Udaipur, Ajmer, Jhalawar, Alwar-I, Bundi, and Nagaur-I) of Rajasthan and 2 KVKs (Bhiwani and Sirsa) of Haryana. The strategy of the seed hub project included:

- Production of 1000 q seed by each center annually in participatory mode .
- Partnership with NSC and State Seed Cooperations.
- Improvement in Varietal Replacement and Seed Replacement Rate.
- Establishment of seed processing plant and storage godown.

During Kharif-2023, 7 KVKs of Rajasthan produced 730.23 q seed of greengram and blackgram. During rabi-2023-24, 9 KVKs targeted to produce 4350 q seed. ICAR-ATARI, Jodhpur facilitated the seed hub implementing KVKs for registration on SATHI (Seed Traceability, Authentication and Holistic Inventory) portal, a centralized online system for seed traceability, authentication and inventory designed to deal with the challenges of seed production, quality seed identification and seed certification.

3.11 District Agro-Met Unit (DAMU) under Gramin Krishi Mausam Sewa (GKMS)

Indian Council of Agricultural Research and India Meteorological Department (IMD) have implemented 16 District Agromet Units in 9 KVKs in Rajasthan, 6 in Haryana, and 1 in Delhi in first phase and 18 DAMUs in 10 KVKs of Rajasthan and 8 of Haryana in second phase. Subject Matter Specialists (SMSs) in agro-meteorology and agromet observations were also provided to run these units and help in agro-advisory services. These DAMU units receive advisories from the regional IMD centers or IMD, New Delhi on every Tuesday and Friday and issue advisories including forewarning to farmers based on the

weather forecast of IMD. The advisories and weather forecast are done in local and regional languages through different communication means. All India Radio, Kisan TV and Doordarshan are actively involved in these services.

FARMER AWARENESS PROGRAMME

The KVK based DAMU host farmer awareness events to educate them about the use of various mobile apps and other media to avail meteorological information.

Table 3.3 Farmers awareness programmes conducted under DAMU 2023-24

Name of unit	Block	Total FAP	Total Farmers
Dholpur	1	6	250
Karauli	2	8	256
Jalore	3	6	206
Pali	3	4	130
Sirohi	2	16	400
Jaisalmer-I	1	2	80
Dungarpur	1	2	104
Bhiwani	7	13	668
Rohtak	2	3	200
Gurugram	1	12	1605
Jhajjar	4	11	1800
Jind	3	17	2012
Kurukshetra	2	16	701
Fatehabad	7	9	1702
Panipat	3	9	2300
Sonipat	7	10	1089
Yamunanagar	3	15	1115
Total	**52**	**159**	**14618**

AGRO ADVISORY SERVICES

DAMUs issue agriculture and weather advisory regarding rainfall, temperature, wind speed and direction, relative humidity, and cloud conditions for the next five days based on the medium-term weather forecast it has received from the IMD, Pune, and other centres. It is prepared on Tuesdays and Fridays and delivered to the district's farmers via a variety of channels, including WhatsApp, Facebook, Twitter, email, newspapers, printed publications, radio, television, and different agencies.

Table 3.4 Agro-advisories services by DAMU during 2023-24

Medium of Transfer	No. of Agro Advisory	No. of Farmers
Whatsapp	104	299587
Facebook	104	25698
Twitter	104	105
E-Mail	104	1099
NEWS Paper	104	566387
T.V.	104	780000
Total		**1672876**

FARMER SCIENTIST INTERACTION

The scientists and farmers interaction are held on all important occasions and issues facilitated by KVKs. Farmers were informed about the means and their utility for obtaining weather information in mela, farmers seminars, etc.

Table 3.5 Farmers-Scientists Interaction under AAS during 2023-24

Name of KVK	No. of Interaction	No. of Farmers
Baran	6	160
Jalore	5	170
Jaisalmer-I	4	100
Hanumangarh-I	3	120
Jhajjar	3	70
Bhiwani	9	344
Karnal	3	60
Kurukshetra	6	180
Mahedragarh	13	527
Fatehabad	2	50
Yamunanagar	4	80
Total	**58**	**1861**

3.12 Mera Gaon- Mera Gaurav (MGMG)

There are 26 ICAR Institutes/SAUs in Rajasthan, Haryana and Delhi. Out of these 15 ICAR/SAUs reported activities under MGMG. Total 276 groups/teams of scientists formed involving 1001 scientists and 993 villages were covered with 12531 activities carried out. Total of 5083 messages or advisory were sent to farmers and 104641 farmers benefitted by the activities of these institutes/SAUs under MGMG during the year 2023.

Table 3.6 Summary of activities under MGMG during 2023-24

State	Institutes/ universities involved (No.)	Groups/ team formed (No.)	Scientists Involved (No.)	Villages Covered (No.)	Field activities conducted (No.)	Messages/ advisory sent (No.)	Farmers benefited (No.)
New Delhi	4	127	520	443	1233	243	16053
Haryana	4	48	175	280	2989	1535	20542
Rajasthan	7	101	306	270	8309	3305	68046
Total	**15**	**276**	**1001**	**993**	**12531**	**5083**	**104641**

3.13 Nutri-Sensitive Agricultural Resources and Innovation (NARI)

Nutri-Sensitive Agricultural Resources and Innovation (NARI) programme was undertaken by 49 KVKs in Zone-II. Total 2913 demonstrations on Nutri-garden benefitting 3404 farmers/farm women were conducted during 2023-24. Besides, 1500 demonstrations on bio-fortified varieties, 194 on value additions, and 3 on food fortification were also conducted with the participation of 2532, 639 and 82 farmers/farm women, respectively. Total 121 training programmes and 114 extension activities were organized with participation of 3829 and 5413 farmers/ farm women, respectively.

Table 3.7 Details of NARI activities during 2023-24

State	KVKs	Demonstration (number)				Training (No)	Extension activities (No)
		Nutri-garden	Biofort varieties	Value addition	Food fortification		
New Delhi	1	0	20(20)	10(60)	0	3(70)	5(495)
Haryana	14	586 (791)	140(1100)	39(313)	01(30)	47(1472)	43(2508)
Rajasthan	34	2322(2613)	1340(1412)	145(266)	02(52)	71(2287)	66(2410)
Total	**49**	**2913(3404)**	**1500(2532)**	**194(639)**	**03(82)**	**121(3829)**	**114(5413)**

Note: Figures in parentheses are number of beneficiaries/participants

3.14 Out Scaling of Natural Farming through KVKs

The project 'Out Scaling of Natural Farming through KVK' implemented by 38 KVKs in the states of Rajasthan, Haryana and Delhi during 2023 (Table 3.8). Three major activities were conducted under Outscaling of Natural farming Project-(i) trainings; (ii) awareness creation; and (iii) demonstrations on natural farming practices and protocols.

During 2023-24, total 1163 awareness, 60 trainings and 787 demonstrations were conducted in Rajasthan, Haryana and Delhi. Total participants in the awareness campaigns/programmes were 87093 and 2453

Table 3.8 Summary of various activities carried out during 2023-24 under Out Scaling of Natural Farming Project

State	KVKs (No.)	Awareness Programmes		Trainings Programmes		Demonstrations	
		No	Participants	No	Participants	No	Area (ha)
Rajasthan	19	561	34969	25	1044	383	136.1
Haryana	18	574	51185	34	1369	388	154.2
Delhi	01	28	939	1	40	16	8.0
Total	**38**	**1163**	**87093**	**60**	**2453**	**787**	**298.3**

farmers in trainings. Total 787 demonstrations on natural farming practices in field and horticulture crops were conducted during 2022-23 (Table 3.9). Out of 787 total demonstrations, 388 were conducted in Haryana accounted and 383 in Rajasthan and 16 in Delhi. These demonstrations involved cereals, pulses, and seed spice crops with total area being 298.3 ha area. The demonstrations were conducted at KVK farm as well as on farmer's fields.

Natural farming led to reduction in the cost of cultivation of crops by 12.2% in wheat in Rajasthan to 16.5% in greengram in Haryana as compared to conventional farming practices. The yield of crop decline by 13.2% in wheat to 27.8% in cumin in Rajasthan. The reduction in yield was less in Haryana and Delhi than Rajasthan. The return from natural farming produce was very encouraging as reflected from B:C ratio. The per rupee invested in wheat under natural farming gave Rs. 1.99, 1.91 and 1.5 in as compared to 1.56, 1.77 and 0.81 under conventional practice in Rajasthan, Haryana and Delhi conditions, respectively. Overall, an additional return of Rs. 0.43, 0.23 and 0.69 per rupee invested was received due to natural farming of wheat under Rajasthan, Haryana and Delhi conditions, respectively. The farm produce under natural farming reportedly were sold with premium price farmers in all the cases except for barley in Rajasthan which gave low yield and low return under natural farming. As 22-23 was the first year for the field demonstrations, the yield penalty was a natural outcome as happens in majority of the alternate crop nutrition models and practices against chemical fertilizer application in field crops.

Table 3.9 Performance of crops under natural and conventional farming (chemical fertilizers usage) during 2023-24

State	Crops	Conventional farming				Natural farming			
		Yield (q/ha)	Cost of cultivation (Rs/ha)	Net Return (Rs/ha)	B:C Ratio	Yield (q/ha)	Cost of cultivation (Rs/ha)	Net Return (Rs/ha)	B:C Ratio
Rajasthan	Wheat	38.67	37472	58506	1.56	33.57	32904	65492	1.99
	Barley	48.10	32940	63260	1.92	39.40	28440	50360	1.77
	Cumin	4.50	38840	61510	1.58	3.25	33586	67485	2.01
	Gram	15.58	36746	61980	1.69	24.87	31005	59552	1.92
Haryana	Wheat	38.97	38236	67535	1.77	30.89	32842	62571	1.91
	Moong	33.31	36831	64081	1.74	25.70	30769	54946	1.79
Delhi	Wheat	42.50	48110	39078	0.81	35.00	41950	63050	1.50

CHAPTER 4

Directorates of Extension Education

Directorate of Extension Education (DEE) is the nodal agency for agricultural extension activities of State Agricultural Universities (SAUs) and promoting linkage on agricultural extension with the line departments of the States, concerned. Training, advisory services and supply of farm information to extension professionals, personnel and farmers are carried out for transfer of agricultural technologies. DEEs provide an overarching governance and coordination framework for on-farm testing and front line demonstrations through KVKs as well as all activities of KVKs through the institutional mechanism for planning, implementation, monitoring and evaluation. A multi-disciplinary team of scientists works in the Directorate of Extension Education for close co-ordination with Department of Agriculture, Animal Husbandry, Horticulture, Forestry, Co-operatives, Panchayati Raj Institutions and other agencies involved for socio-economic development of the rural areas.

The **broad objectives** of DEEs are:

- To develop mechanism of diagnosis, identification, prioritization of field problems and their communication to research system of university.
- To impart the trainings to the in-service, extension functionaries of State Agriculture Departments, line departments of state government, non-governmental organisations, private dealers and agencies.
- To coordinate short and long-term vocational trainings for farmers, farm women, youth & school dropouts.
- To develop partnership with research system for technological backstopping to KVKs staff especially various technological packages under are of jurisdiction including NGO's KVKs., and
- To provide farm advisory/information services including literature for fostering dissemination process of agricultural technologies.
- To develop close linkages with different ICAR Institutes, development departments, NGOs, local traders, SHGs, FPOs, FIGs, etc.

Total seven DEEs, 6 in Rajasthan and 1 in Haryana are functioning for delivering extension services. The distribution of DEEs is given in Table 4.1.

Table 4.1 Director of Extension Education & Technology Backstopping to KVKs.

S.No.	Director's name	SAUs	Technological backstopping for KVKs (No.)				
			SAU/CAU	ICAR	NGO	DU	Others
1	Dr. Dr. Subhash Chandra	SKRAU, Bikaner (Rajasthan)	7	0	1	0	1
2	Dr. R.A.Kaushik	MPUA&T, Udaipur Rajasthan)	8	2	1	0	0
3	Dr. Jetawat	Agricultural University, Jodhpur	6	2	1	0	0
4	Dr. S. K. Jain	Agricultural University, Kota	6	0	0	0	0
5	Dr. Sudesh Kumar	SKNAU, Jobner	7	1	1	0	1
6	Dr. R. K. Duria	RAJUVAS, Bikaner	1	0	1	0	0
7	Dr. Balwan Singh Mandal	CCSHAU, Hisar	14	2	2	0	1
			49	7	7	0	3

4.1 Human Resource Development

DEEs have been functioning for enhancing knowledge and upgrading skills of subject matter specialists and Senior Scientist & Heads under human resource development activity. During 2023, 15 training programmes under capacity development programmes were organized by DEEs with 4086 participants.

Table 4.2 HRD activities organized by DEEs in Zone-II

DEEs	Training areas	Trainings (No.)	Participants (No.)	KVKs (No.)
DEE, MPUAT, Udaipur	Directorate of Extension Education organized one day training programme on poultry farming under Mera Goav Mera Gourav.	1	50	8
	Fifteen days Retail Fertilizer Dealers Certificate Course	6	224	8
	Directorate of Extension Education and KVKs organized training on "Energy Efficiency and Energy Conservation"	8	839	8
	DEE and KVKs organized one training programme on Cultivation Techniques and preparation of various recipes of different type of millets.	8	297	8
	DEE and KVKs organized 4 to 5 days training programme on Processing and Value Addition of Minor Millet.	25	626	8
	KVK, Chittorgarh organized training on seed production technologies.	1	50	8
	Pragya institute organized training programme on "Organic Cultivation Harvesting & post Harvesting of Medicinal & Aromatic Plants" at DEE, Udaipur from 10th to 11th July, 2023	1	42	8
	Directorate of Extension Education organized one training course of five days duration on "Integrated Farming System" and "Production and Processing Technology of Horticultural Crops" for farmers of Tonk, Neemach and Mandsaur (MP).	3	95	8
	Directorate of Extension Education organized two days training programmme on Establishment of Agro-Processing Business" under Rjasthan Bal Kalyan Samiti, Udaipur	1	60	8
	Total (a)	**54**	**2283**	**72**
DEE, AU, Jodhpur	One KVK one Product workshop	3	35	8
	PM Kisan Sammelan	2	68	8
	Annual Zonal review Workshop of KVKs of Zone-II	1	110	63
	Total (b)	**6**	**213**	**79**
DEE, SKNAU, Jobner	A 3 days training programme entitled "Promotion Organic farming" was jointly organized at Directorate of Ext. Edu., SKNAU, Jobner in collaboration with Extension Education Institute, Anand (Gujarat) from 16-01-2023 to 18-01-2023.	1	25	11
	A 3 days training programme entitled "Good Agriculture & Allied Practices for Doubling Farmers Income" was organized at Directorate of Ext. Edu., SKNAU, Jobner in collaboration with Extension Education Institute, Anand (Gujarat) from 01 to 03 March, 2023.	1	23	8

DEEs	Training areas	Trainings (No.)	Participants (No.)	KVKs (No.)
	3 days training programme entitled "Training Methods & Training management skill" was organized at Directorate of Ext. Edu., SKNAU, Jobner in collaboration with Extension Education Institute, Anand (Gujarat) from 31 July to 02 Aug, 2023.	1	25	8
	3 days training programme entitled "Communication & motivation skill for effective extension services" was organized at Directorate of Extension Education, SKNAU, Jobner in collaboration with Extension Education Institute, Anand (Gujarat) from 03 to 05 August, 2023	1	25	8
	Training of Master Trainers (Teachers from Govt. schools) under the school Nutrition Garden Initiatives organized at DEE, SKNAU, Jobner on dated 27-09-2023 by UN World Food Programme	1	32	8
	Final examination of trainees of DAESI Diploma course was started from Feb.,2022 at DEE, SKNAU, Jobner for 48 days	1	38	-
	Training of KVK scientists on 'Improved Management Technologies for Milch Animals' organized at DEE, SKNAU, Jobner on dated 07-10-2023	1	20	8
	Total (c)	**7**	**188**	**51**
	Biomass management and its Utilizations (3-4 Feb. 2023)	1	20	6
	Training program on Agriculture Marketing (03.07.2023)	1	30	1
	Total (d)	**2**	**50**	**7**
CCSHAU, Hisar	Recent advances in Rabi & Kharif crops	8	24	19
	Introductory training course for newly recruited scientists	1	30	10
	Total (e)	**9**	**54**	**29**
	Grand Total	**78**	**2788**	**238**

4.2 Workshops/Meetings Organized

The meetings and workshops for guiding, advising and supervising the activities of KVKs were also organized by DEEs . Details of workshops/meetings organized by the DEEs and participation of KVKs are given in the table 4.3.

Table 4.3 Workshops/meetings organized by DEEs

S.No.	Workshop/meeting conducted	No. of KVKs participated
SKRAU, Bikaner, Rajasthan		
1	Review meeting of Action Plan 2023	7
2	Workshop for innovative farmers	7
3	Meeting for convocation	1
4	EAC meeting (15.05.23 &26.10.23)	14
5	Workshop of KVKs for FLD Technology progress	7

S.No.	Workshop/meeting conducted	No. of KVKs participated
MPUAT, Udaipur, Rajasthan		
1	Directorate of Extension Education, MPUAT, Udaipur organized Industry Academia-Meet sponsored by Dhanuka on 28.11.2023.	8
2	Directorate of Extension Education organized pre Annual Review Workshop of KVKs (2023-24) on 4th January, 2023.	8
3	Directorate of Extension Education, MPUAT, Udaipur organized Krishi Vigyan Mela in collaboration with Agriculture Technology Management Agency (ATMA) on 19th March, 2023 at Rajasthan College of Agriculture, Udaipur. The theme of mela was "Millet Production, Natural Farming and Farm Machinery - prosperity of farmers".	8
SKNAU, Jobner		
1	Monthly meeting of KVKs on dated 05-01-2023 at DEE	11
2	Monthly meeting of KVKs on dated 14-02-2023 at RARI, Durgapura	11
3	Monthly meeting of KVKs on dated 10-03-2023 at KVK, Kotputli	11
4	Monthly meeting of KVKs on dated 13-04-2023 at KVK, Vansthali-Tonk	11
5	Monthly meeting of KVKs on dated 28-06-2023 at DEE	11
6	Monthly meeting of KVKs on dated 29-09-2023	11
7	Monthly meeting of KVKs on dated 06-11-2023 at KVK Ajmer	11
AU, Kota, Rajasthan		
1	KVKs monthly review meeting	6
RAJUVAS, Bikaner		
1	SAC Meeting	1
2	Review Meeting	1

4.3 Visits of Directorate of Extension Education Personnel to KVKs

During 2023, Directorate of Extension Education personnel made 247 official visits to KVKs for participation in various programmes and activities (Fig.4.1). The maximum visits (64) were made for visits for participation in training programmes followed by 63 visits for Field Days, 55 visits were done for SAC meetings of KVKs, 49 visits were made for workshops, 11 visits were made for others and 5 visits were for technology week celebrations of KVKs.

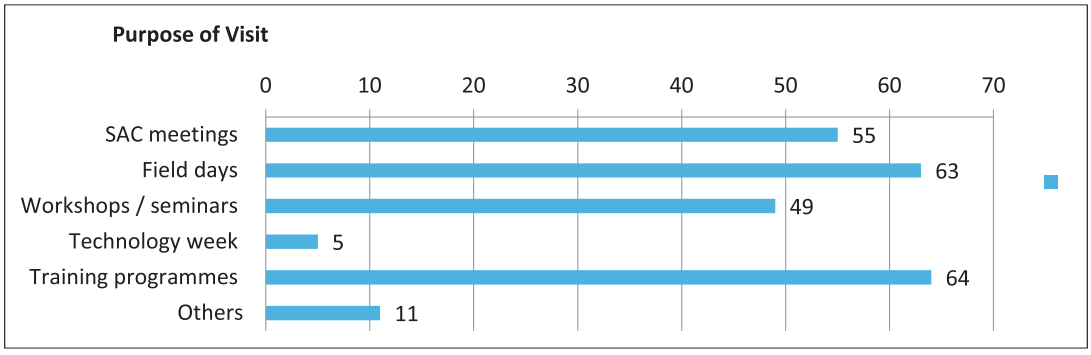


Fig. 4.1 Visits of Directorate of Extension Education personnel to KVKs.

4.4 Publication and Updating of Technology Inventories

Assessing demonstrations of agricultural technologies for its best suitability in local conditions is one of the important functions of DEEs. In the current year, 36 technology inventories published by DEEs, while 32 technology inventories updated for benefit of farming community (Fig. 4.2).

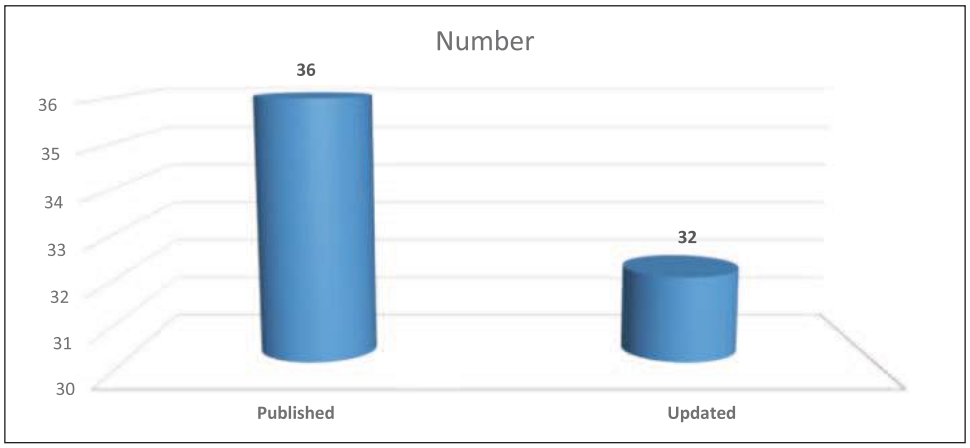


Figure 4.2 Technology inventory published & updated by DEEs.

4.5 Technological Products Provided to KVKs

DEEs provided technological products to KVKs under their jurisdiction in Zone-II as given in fig.4.3. Seed materials supplied **to** 53 KVKs, planting material to 31 KVKs, Bio-products to 15 KVKs, Livestock breed to 22 KVKs, Livestock product to 16 KVKs, Poultry breeds to 24 KVKs and poultry product to 13 KVKs. The details about technological products provided to KVKs are given in fig. 4.3.

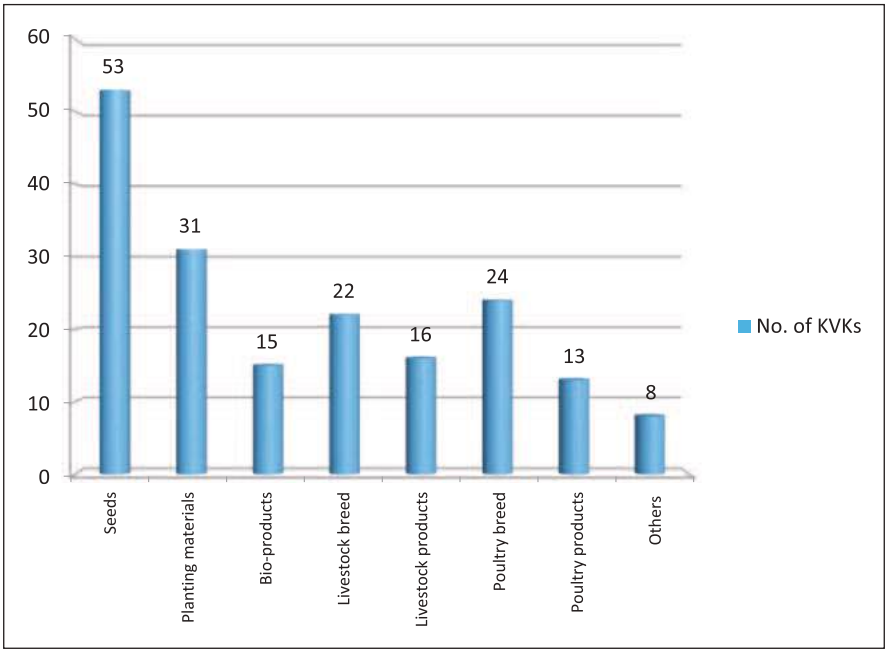


Fig. 4.3: Technology/planting material/breeds/products provided to KVKs.

Training on Organic farming at SKNAU, Jobner of EEI, Anand

Visit to field experiments on field crops at RARI, Durgapura, Jaipur on 14 February, 2023

CHAPTER 5

Agricultural Technology Information Centre

Agricultural Technology Information Centre (ATIC) have been providing the services and information on recent technologies to the farmers for the jurisdiction of SAUs and ICAR Institutes. The ATIC also acts as a delivery window for the technological products of SAUs and ICAR institutes to farmers and other interested individuals and groups as process of innovativeness in technology dissemination. There are 6 ATICs working under various SAUs and ICAR Institutes in Rajasthan, Haryana and Delhi (Table 5.1). The details of activities of ATICs during 2023 are presented in following para.

Table 5.1 ATICs functioning in Rajasthan, Haryana & Delhi

S.No.	Name of ATIC	Host Institute	ATIC Manager
1.	CAZRI, Jodhpur	CAZRI, Jodhpur	Dr. S.P.S.Tanwar
2.	SKRAU, Bikaner	SKRAU, Bikaner	Dr. Meenakshi Choudhary
3.	MPUA&T, Udaipur	MPUA&T, Udaipur	Dr. R.S. Rathore
4.	IARI, New Delhi	IARI, New Delhi	Dr. N. V. Kumbhare
5.	NDRI, Karnal	NDRI, Karnal	Dr. A. K. Misra
6.	CCSHAU, Hisar	CCSHAU, Hisar	Dr. J.K. Malik

5.1 Farmers' visit to ATICs

The total number of 49863 farmers visited ATICs to seek information and technology and 28725 farmers purchased seed and other products developed by ICAR institutes and SAUs. Details are given in Table 5.2.

Table 5.2 Farmers' visits to ATICs

S.No.	Purpose of visit	Number of farmers visited
1	Technology Information	49863
2	Technology Products	28725
3	Others	0

5.2 Operational Facilities in ATICs

The exhibition/technology museum and farmers' feedback register facilities are available in all the ATICs and 6 ATICs have reception and sales counter. Touch screen Kiosk and cafeteria facilities are available in three ATICs. The details of operational facilities available in ATICs of Zone-II are given in Table 5.3.

Table 5.3 Operational Facilities in ATICs

S.No.	Particulars	Availability (•)	No. of ATICs
1	Reception counter	•	6
2	Exhibition / technology museum	•	6
3	Touch screen Kiosk	•	2
4	Cafeteria	•	3
5	Sales counter	•	6
6	Farmer's feedback register	•	6

5.3 Technology information provided by ATICs

The ATICs provide latest information to the farmers about varieties / hybrids, pest and disease management, agro-techniques, soil and water conservation, post-harvest technology and value addition, animal husbandry, dairying and fisheries. The number of farmers benefited by the information provided on these commodities through Kisan Call Centre/other phone calls from farmers (21680), video shows (6223), written responses on letters received (36) and training to different stakeholders (149). The details are given in Table 5.4.

Table 5.4 Technology information provided by ATICs in Zone- II

S.No.	Information category	No. of ATICs	Farmers benefited (No)	Category of information						
				Varieties / hybrids	Pest management	Disease management	Agro-techniques	Soil and water conservation	Post-harvest technology and Value addition	Animal husbandry and fisheries
1	Kisan Call Centre / other Phone calls from farmers	6	21680	13148	2432	1931	2273	545	627	724
2	Video shows	3	6223	810	1200	312	0	0	5	3896
3	Letters received	2	36	21	2	5	0	0	0	8
4	Letters replied	1	22	5	5	3	0	0	0	9
5	Training to farmers/students/ technocrats	2	149	1	1	1	1	0	0	145

5.4 Publications (Print & Electronic Media)

ATICs of Rajasthan, Haryana and Delhi published books (2978) and technical bulletins (5563) for the benefit of farmers (Table 5.5).

Table 5.5 Publications (Print & Electronic media) provided by ATICs in Zone- II

S.No.	Particulars	Number sold	Revenue generated (Rs.)	Farmers benefited (No)
1	Books	1560	85173.5	1321
2	Technical bulletins	3320	1177	3326

5.5 Technology Products

The technology products like seeds (3181.43 q), planting materials (87181 nos.) and bio-products (1255 q) were provided by different ATICs under Zone-II to 11409, 2804 and 1044 farmers, respectively (Table 5.6).

Table 5.6 Technology Products provided by ATICs

S.No.	Particulars	Quantity	Unit of quantity	Value (Rs.)	Number of farmers benefited
1	Seeds	3181.43	Quintal	7689013	11409
2	Planting materials	87181	Numbers	1701745	2804
3	Bio-products	1255	Quintals	208716	1044

5.6 Technology services

ATICs provided technology services like soil and water testing, plant diagnostics and services to line departments and others benefiting 347, 1201, 5892 and 3228 farmers, respectively. The details of technology services provided by ATICs are given in Table 5.7.

Table 5.7 Technology services provided by ATICs in Zone- II

S.No.	Particulars	Number of farmers benefited
1	Soil and water testing	347
2	Plant diagnostics	1201
3	Services to line departments	5892
4	Others	3228

CHAPTER 6

On Farm Testing

Agriculture is rather diverse and complex activity within a farm and between the farms in the same locality and under different geographies. Every farming situation is complex micro-environment. The problems of the farmers within a micro-climate and farming situations varies from others in the same districts or sometimes the same block. The on-farm trial (OFT) is a problem-solving technology testing wherein a new but proven technology elsewhere is put at farmers fields against an experienced problem of a large group of farmers of an unexplored location. As such it has the farming situation perspective and rather sensitive to farming systems interactions within a farm and between farms. As a principle, an OFT should target the larger groups of farmers and the frequently occurring problems that cause severe productivity loss affecting major crops and enterprises in a given area.

The on farm testing primarily are conducted on varietal evaluations, integrated crop management, integrated pest/diseases/weed management, integrated nutrient managements, NRM (IFS/natural farming/ RCT), livestock health, nutrition and breed management, seed and planting materials and women and child care, drudgery reduction, farm machinery, etc. During 2023, 2468 OFTs were conducted at farmers fields with more than 299 technologies under diverse thematic areas (Table 6.1).

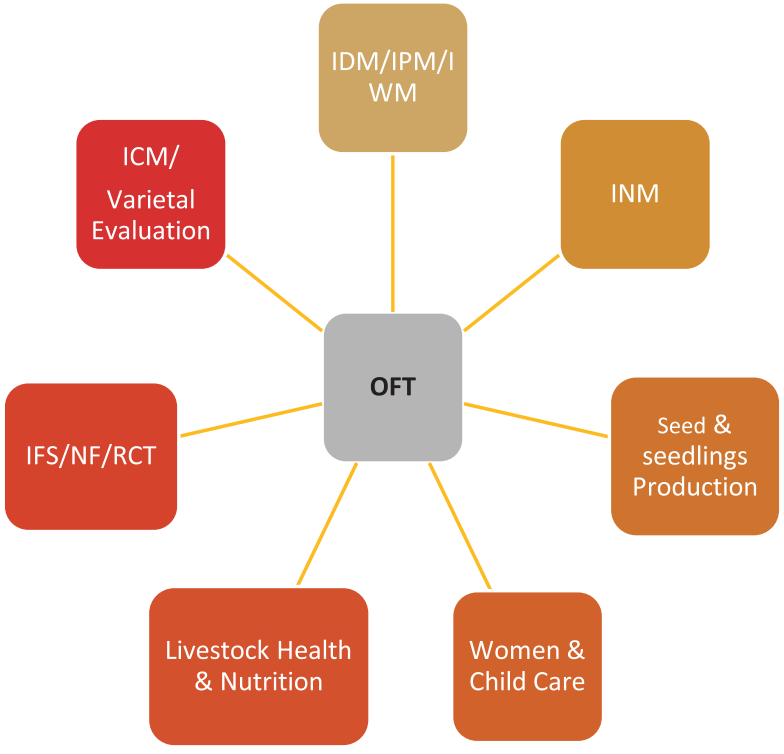


Figure-1: Major Problem Areas of OFTs

Table 6.1 OFTs under various thematic and problem-areas during 2023

Thematic Areas	No. of OFTs	Number of Trials
Varietal Evaluation	28	188
Integrated Pest/Disease/Weeds Management	98	828
Integrated Crop Management	23	143
Integrated Nutrient Management	75	564
IFS/Natural Farming/RCT	29	187
Seed & Seedling production	4	35
Livestock Health, Nutrition & Management	21	224
Women & Child Care	8	160
Miscellaneous	13	139
Total	**299**	**2468**

The maximum numbers of OFTs were conducted on plant protection and weed management options followed by nutrient management which indicated the major problem areas in agriculture by a larger proportion of the farmers, The natural resource related problems and varietal preferences were almost identical in prioritizations of OFTs (Figure-2).

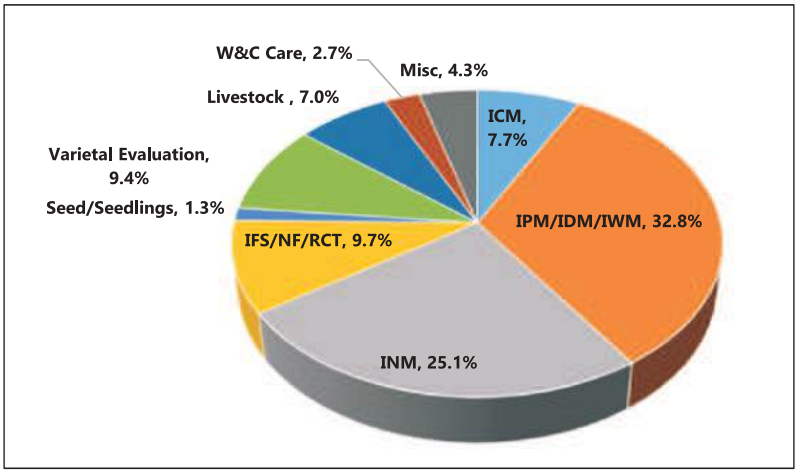


Fig. 2 Distribution of OFTs under Problem Areas

Varietal Evaluation

KVK, Faridabad

Problem definition: Low productivity of existing wheat (Triticum aestivum)

Technology Assessed: New wheat varieties HD-3226 and HD-3086.

Source of Technology: ICAR-IARI, New Delhi

Wheat covers 80% area of cropping in winter in Faridabad with ~ 30000 ha acreage. The farmers have been growing old varieties of wheat the yield of which have been plateauing. HD-2967 cover 57% area in the district. The concentration of one variety has been a matter of concern for any outbreak of diseases and pests and wanted to diversify the wheat varieties with newly

released HYVs. An on-farm testing of newly released wheat varieties viz. HD-3226 was conducted against HD- 3086. The new variety HD-3226 gave 46.2q/ha grain yield compared to 42.5 q/ha of HD-3086. The grain yield of HD- 3226 was 8.7% than HD-3086. The B:C ratio of HD-3226 and HD-3086 was 3.07 and 2.96 respectively (Table 6.2).

HD-3226 and HD-3086 wheat varieties under OFT

Table 6.2 Varietal Performance of timely sown wheat varieties

Technology Option	No.of trials	Yield (kg/ha)	Increase in yield (%)	Net Returns (Rs./ha)	B:C Ratio
HD-3086 (Farmers practice)	5	4250	-	73060	2.96
HD-3226 (New variety)		4620	8.7	79675	3.07

Problem definition: Low nutrition value varieties prevalent in Haryana

Technology Assessed: Biofortified wheat varieties under timely sown conditions.

Source of technology: ICAR-IARI, New Delhi

An on-farm trial was conducted on biofortified wheat varieties under timely sown conditions against existing variety of wheat in Faridabad conditions. The biofortified variety of wheat produced 44.2 q/ha grain yield and 3.19 B:C ratio (Table 6.3). which were slightly lower than the ruling variety of wheat HD-3086 (44.5 q/ha and B:C ratio 3.21) due to slight yield penalty of (-0.67 %).

Table 6.3 Assessment of Biofortified wheat varieties under timely sown conditions

Technology Option	No. of trials	Yield (kg/ha)	Increase in yield (%)	NNet Returns (Rs./ha)	B:C Ratio
T1- HD-3086 (Farmers Practices)	5	4450	-	82310	3.21
T2- HD-3298 (Biofortified)		4420	-0.67	81675	3.19

KVK, Hanumangarh-II

Problem definition: Low yield of wheat variety under salt affected soils

Technology Assessed: Introduction of salt tolerant variety KRL 213

Source of Technology: ICAR-CSSRI, Karnal

On-farm testing of salt tolerant variety of wheat KRL 213 was conducted against existing variety HD 3086 and (T2) KRL 213. The results indicated that new variety KRL 213 produced 29.1 per cent higher yield (28.8 q/ha) as compared to farmers variety HD 3086 (20.2 q/ha) under the salt affected area of the district. Net return with KRL 213 was Rs 38282 with B:C ratio 2.93 which was substantially higher than HD 3086 (Rs 20953 with B:C ratio 2.06). Farmers were satisfied with the performance of KRL 213 new Wheat variety.

KRL 213 wheat under Hanumangarh conditions

KVK Nagaur-I

Problem definition: Low nutrition varieties prevalent in Rajasthan

Technology Assessed: High yielding new wheat variety under timely sown conditions.

Source of Technology: ICAR-IARI, New Delhi

On-farm testing of wheat variety HI 8759 (Pusa Tejas) against farmer practices (Raj-3765) was conducted under Nagaur conditions during Rabi 2022-23 at three locations on 10 farmer's fields. The farmers were advised to sow improved high yielding wheat variety with optimum seed rate along with use of balanced fertilizers and timely management of weeds, irrigation, insect and pests. The HYV of wheat HI 8759 gave 61.04 q/ha grain yield, Rs. Rs. 88055./ ha net return and 3.11 B:C ratio against 51.13 q/ha grain yield, Rs. 68322/ha net return and 2.69, B: C ratio with Raj 3765 Farmers were satisfied with the results of HI – 8759 (Pusa Tejas).

KVK Delhi

Problem definition: Low yield of mustard in salt affected soils and water

Technology Assessed: High yielding salt tolerant mustard variety

Source of Technology: ICAR-CSSRI, Karnal

The PRA survey conducted by KVK Ujwa established low yield of mustard due to saline irrigation water. Keeping in view, AN on farm testing of mustard variety CS 60 was conducted against the existing variety T-59 at 5 locations. The salt tolerant variety of mustard (CS 60) gave 22.5 q/ha seed yield as compared to 19.5 q/ha under T-59. The net return of Rs.91000/ha and BC ratio of 1:1.35 was obtained with 'CS 60' mustard and Rs.71500/ha and 1:1.28 with farmers practiced variety. Farmers were are satisfied with the results of CS 60 variety of mustard.

KVK Panipat

Problem definition: Pusa 1121 getting susceptible to diseases and pests

Technology Assessed: New high yielding basmati rice varieties

Source of Technology: ICAR-IARI, New Delhi

About 90 per cent of total area under rice is under Basmati in Panipat district of Haryana wherein PB 1121 is the dominant variety. Of late this variety has shown susceptibility to diseases and consequently higher pesticide load in the produce. The productivity has also shown decline at farmers' fields. In order to diversify the varietal profile of the basmati rice in the district, an on-farm testing of newly released basmati varieties resistant to bacterial leaf blight (BLB) and Blast was introduced at farmers conditions. The basmati rice varieties PB 1718

and PB 1885 which are resistant to BLB and Blast were tested against PB 1121. The grain yield of PB 1718 was the highest of 48.2 qt/ha registering an advantage of 2.8 qtls/ha over PB 1121. Net returns and benefit-cost ratio was higher with PB 1885 because its market price being at par with PB 1121 (Table 6.4). Farmers also got good price for straw in manually harvested crop.

The higher yields were obtained in 2023 as the crops were almost free from the incidence of plant hoppers and blast. However, the infestation of stem borer and leaf folder was more. No incidence of Southern Rice Black Streaked Dwarf Virus (SRBSDV) was observed at any of the location. The market also behaved optimally and farmers got good price of their produce. The technology is accessible as enough seed of new varieties would be available to farmers in kharif 2024; acceptable due to better returns and higher yields and affordable as basmati rice has been an ongoing practice and no additional cost is involved in these varieties.

Table 6.4 Comparison of different Varieties of Basmati Rice

Treatment	Yield (q/ha)	% increase	Net Returns (Rs./ha)	B:C Ratio	BLB incidence
PB1121	45.4		173465	4.01	Nil
PB 1718	48.2	6.2	175791	4.07	Nil
PB 1885	46.8	3.1	181600	4.24	Nil

Problem definition: Low yield of ruling wheat variety

Technology Assessed: High yielding wheat variety

Source of Technology: ICAR-IARI, New Delhi

An on farm experiment was conducted to assess the performance of different varieties of wheat varieties. Higher productivity was observed in DBW 303, DBW 303 and DBW 222 in comparison to HD 2967. Neither the yellow rust and nor the aphid incidence was observed this year. Low productivity of leading wheat variety "HD 2967" is very major problem. This variety is susceptible to yellow rust. Yellow rust has emerged as yield limiting factor and it can be best managed through use of resistant varieties. There is a need to diversify the varietal basket by including the yellow rust resistant varieties (Table 6.5).

Higher productivity was observed in DBW3 03, WH 1270 and DBW 222 in comparison to HD 2967. Neither the yellow rust and nor the aphid incidence was observed this year

Table 6.5 Performance of new wheat varieties at farmers fields

Treatments	Av. Yield (q/ha)	Net returns (Rs/ha)	B: C Ratio	Rust Incidence	Rank 1st
T_1- HD 2967	53.8	91598	3.89	Nil	0
T_2- DBW 1270	54.6	93298	3.94	Nil	2
T_3- DBW 303	56.5	97336	4.07	Nil	3
T_4- DBW 222	54.5	93086	3.93	Nil	0

KVK Rewari

Problem definition: High incidence of YMV in farmers varieties of okra

Technology Assessed: High yielding YMV resistance varieties of okra

Source of Technology: ICAR-IIVR, Varanasi

Okra is an important crop of Rewari district grown in summer and kharif seasons The yield of okra get affected due to incidence of yellow vein mosaic virus & leaf curl virus disease in farmers practiced varieties. An

on-farm experiment was ocnudcted at Nimoth, Siha, Bhuriyawas, Guryani villages of Rewari district during kharif 2023 involving okra varieties Kashi Lalima and Pusa Bhindi 5. The soil was sandy loam and good quality groundwater used for irrigation. YMV and leaf curl resistant variety Kashi Lalima resulted into 5.1 % higher yield (14.4 tons/ha) with Rs. 260000/ha net return without any incidence of the YMV and leaf curl virus against the net return of Rs. 174000/ha and yields of 13.7 tons/ha with Pusa Bhindi 5 which showed about 1% incidence of yellow vein mosaic virus & leaf curl virus.

KVK, Sawai Madhopur

Problem definition: Low yield of existing onion variety

Technology Assessed: High yielding onion variety

Source of Technology: NHRDF, New Delhi

KVK, Sawai Madhopur in Rajasthan conducted on-farm trial to assess high yielding varieties of onion. The trial was conducted during rabi season 2022-23. The onion var. NHRDF RED-4 recorded highest yield (31.8 t/ha) and net return (Rs. 318000/ha) followed by NHRDF RED-3 (29.0 t/ha and Rs 290000/ha). The farmers practices gave 23.5 tons/ha bulb yield and Rs. 235000/ha net return.

KVK Kaithal

KVK Kaithal assessed low yield of wheat due to soil salinity. KVK, Kaithal conducted on-farm trial to assess the performance of latest salt tolerant variety of wheat KRL 283 in terms of yield, net returns and B:C ratio against the existing wheat variety HD 3086. The results revealed an increase of 1.46 % in wheat yield of KRL 283 (48.7 q/ha) compared to HD 3086 (48.0 q/ha). Moreover, net returns and B:C ratio were higher for KRL 283 (Rs. 38488/ha; 1.51) as compared to HD 3086 (Rs. 37000/ha; 1.49).

KVK Kaithal assessed low yield of wheat due to soil salinity. KVK, Kaithal conducted on-farm trial to assess the performance of latest salt tolerant variety of wheat KRL 210 in terms of yield, net returns and B:C ratio against the existing wheat variety HD 3086. The results revealed an increase of 1.25 % in wheat yield of KRL 210 (48.6 q/ha) compared to HD 3086 (48.0 q/ha). Moreover, net returns and B:C ratio were higher for KRL 210 (Rs. 38725/ha; 1.51) as compared to HD 3086 (Rs. 37000/ha; 1.49).

Weed Management

KVK Delhi

Problem definition: High infestation of weeds in wheat causing low yield

Technology Assessed: Broad spectrum herbicides for control of weeds flora in wheat

Source of Technology: ICAR-IIWBR, Karnal

The PRA conducted in various villages of NCT Delhi established low yield of wheat due to severe infestation of weeds. Considering the problem, on farm testing on weed management in wheat at Jatikra and Sarangpur villages of S-W District of Delhi was conducted during *rabi* season 2022-23 to assess the effect of broad spectrum herbicides on weeds. The treatments comprised of 2,4 D (T 1-farmers practice) and chlorsulfuron 75% + metsulfuron methyl 5% @ 32 g a.i./ha at at 25 DAS as post-em (T2-improved practice). The results revealed that the grain yield of wheat was higher (48 q/ha) in T2 as compared to 42 q/ha under farmers practice. The economic indicators were also

favoring to T2 with net return of Rs. 74500/ ha and B:C ratio of 1:6 as caomared to Rs.60750/ ha and 1.2 under T1.

KVK, Gurugram

Problem definition: Reduction of productivity due to a lot of weed in Pearl Millet crop.

Technology Assessed or Refined: Weed control measures on Pearl Millet yield in Gurugram (Haryana)

Source of Technology: IARI, New Delhi

An on-farm trial on weed management in pearlmillet was conducted under Gurugram condicitons. The results indicated that the use of Atrazine @ 0.75kg *ai* + 2,4-D ethyl ester 0.5kg ai per ha. @ 25-30 DAS gave 11.60 % increase in grain yield over no use of weedicides by farmers. The weed population was reduced by 81.47 percent and grain yield was recorded as 28.90 q/ha with straw yield 65.80q/ha under technical intervention, whereas under farmers practice it was 26.02 q/ha and straw yield 57.48 q/ha.

OFT on Weed management in pearlmillet at Hazipur villages in Gurugram

KVK, Jhunjhunu

Problem definition: Heavy infestation of weed in Pearl millet

Technology Assessed: Weed management in Pearl millet

Source of Technology: IARI, New Delhi

The o-farm trial on chemical weed management in pearlmillet comprising of application of Tembotrine 42% SC @ 120 g. a.i/ha at 20 DAS (T2-imporoved practice) and hand weeding (T-1-farmers practice) was conducted under Jhunjhunu conditions of Rajasthan. Application of Tembotrine 42% SC @ 120 g. a.i/ha resulted the grain yield of 13.13 q/ha of pearl millet which was 18.7% over over hand weeding. The net return was 28569/ ha and B:C ratio was 2.02 in improved treatment against Rs. 20573/ha and 1.76, respectively under farmers practice.

KVK Kaithal

KVK Kaithal assessed low yield of wheat due to high incidence of *Phalaris minor* in wheat. KVK, Kaithal conducted on-farm trial to assess the performance of herbicides T_0: Farmers Practice; T_1: Pyroxasulfone 85 WG @ 150 g/ha and T_2: Pendimethalin 30 EC @ 5 l/ha and yields, net returns and B: C ratio against the Farmers Practice. The results revealed an increase in wheat yield by 7.10 % in treatment T_2 (49.8 q/ha) and 3.01 % in treatment T_1 over T_0 (46.5 q/ha). Moreover, net returns and B:C ratio were higher T_2 (Rs. 36325/ha; 1.46) and T_1 (Rs. 34788/ha; 1.45) as compared to Farmers Practice (Rs. 33813/ha; 1.45).

Management of *Phalaris minor* in wheat

KVK, Karauli

Efficacy of Post emergence herbicides to control the weeds in wheat was assessed by KVK Karauli using two practices - Farmer practice (T1) i.e., application of 2,4-D @ 1.0 kg /ha and improved practice (T2), i.e., application of Sulfosulfuron 75% WG + Metsulfuron Methyl 5% WG @ 32 gm a.i./ha. The weed control efficiency was 77.6% with application of Sulfosulfuron 75% WG + Metsulfuron Methyl 5% WG @ 32 gm a.i./ha against 39.5 % in case of 2,4-D @ 1.0 kg /ha. The grain

yield of wheat was 10.1% higher in T-2 as compared to T-1. The application of Sulfosulfuron 75% WG + Metsulfuron Methyl 5% WG suppressed both borad and narrow leaved weeds in wheat.

KVK Karauli also conducted OFT on weed management in pearl millet using **T**embotrione 42% SC @ 120 g a.i./ha (T2) against Farmer practice- application of 2-4 D @ 0.5kg.a.i./ha (T1). The weed control efficiency was 64.2% with the application of Tembotrione 42% SC @ 120 g a.i./ha at 3-4 leaf stage of weed (20 DAS) while 31.7 % in case of 2,4-D @ 0.5 kg.a.i./ha. Pearl millet yield increased by 9.4% in T-2 treatment as compared to T-1. Application of Tembotrione 42% SC @ 120 g a.i./ha effectively reduced population of narrow as well as broad leaf weeds.

KVK Panipat

KVK Panipat conducted on farm trials on weed management in Direct Seeded Rice (DSR). The treatments included post emergence application of bispyribac sodium 250ml (25 ml a.i.) +125gm (18.75 gm a.i.) ethoxysulfuron/ ha at 25-30 DAS (T1), trifamone+ ethoxysulfuron @ 225 g/ha at 20-25 DAS (T2) ans post em. application of bispyribac sodium 250 ml (25 ml a.i.) +250 g pyrazosulfuron ethyl (25.0 g a.i.) / ha at 25-30 DAS (T3). The highest grain yield of rice was obtained T_2 with marginal difference than other two treatments. Weed control efficiency slightly higher in case of T_2. Under T 2 low population of *Cyperus rotundus* was observed which is the dominant weed flora in DSR. During 2023-24, due to favorable rains in June and July proved advantageous to DSR due to water stagnation in the rice fields for reasonably long period.

An OFT was also conducted in wheat for weed management. Weed control efficacy improved in T_3- PRE application of pyroxasulfone 85% WG @ 150 g (127.5 g a.i.) + pendimethalin 30% EC @ 5 lt (1.5lt a.i.) /ha with respect to *Phalaris minor* and also with respect to broad leaf weeds than T_1- Cross top dressing of metribuzin 70% WP @ 375 g (262.5 g a.i. /ha) at field capacity after first irrigation and T_2- PRE pendimethalin 30% EC @ 5 lt- (1.5 lta.i.) /ha followed by cross top dressing of metribuzin as in T_1. The adverse effect of metribuzin on tillering capacity and on overall growth of the plant was apparent but the compensatory physiological phenomenon operating at the later stage of crop ontogeny was disturbed by terminal heat providing extra advantage in T3.

KVK Rewari

Problem Definition: Low productivity of wheat due to infestation of BLW

Technology Assessed: Herbicidal control of broad leaf weeds in wheat

Source of Technology: HAU Hissar

KVK Rewari conducted OFT on weed management in wheat using Metsulfuron methyl 20% wp@20g/ ha (T_2) against Carfentra zone-ethyle 40% DF + Metsulfuron 10% @50 g/ha (T1-farmers practice). The grain yield under T_2 increased by 5% over farmers practice (T_2) and was maximum (52.50 q/ha.) followed by farmers practice (50.0 q/ha). Further the net profit earned from T_1 was also high (Rs.123352.0 with 3.29 BC Ratio followed by T_2 (Rs.114915.0 and 3.13 BC ratio). Farmers have accepted usability of post emergence weedicide in wheat to control major broad leaf weeds.

KVK Rohtak

Problem Definition: Severe weed infestation in DSR

Technology Assessed: Herbicide weed control in direct seeded rice

Source of Technology: PAU, Ludhiana

Farmers are using only post emergence herbicide application i.e. Bispyribac sodium, 2,4-D for weed

control in rice (T 1) was tested against the recommended herbicides -Pendimethalin 3.25 l/ha + pyrazosulfuron 250 g/ha followed by Council active (Triafamone 20% + Ethoxysulfuron 10% WG) 225 g /ha as post emergence at 25 DAS (T2). The recommended herbicides assessed practice of weed management in DSR found to be better with 16.9% increase in yield over farmers' practice and earned a net profit of Rs 173665 with B:C ratio 4.48 while net profit and BC ratio in control treatment was Rs 143910 and 4.03 respectively.

KVK Udaipur - I

Problem definition: Low yield of soybean due to high infestation of weeds

Technology Assessed: Chemical weed management in Soybean

Source of Technology: AU Kota, Rajasthan

An on-farm trials to manage weed infestation in soybean was conducted in 2023-24. The treatments included T1- farmer's practice (hand/ mechanical weeding); T2- farmer's practice Spray of imazethapyr 10 SL @ 1.0 lit/ha (14-25 DAS) and improved recommendation T3- spray of sodium acifurofen 16.5% + clodinofop-propargyl 8% @ 1.0 lit/ha (14-25 DAS). The trial was conducted at 10 farmers' fields on 0.1 ha each. The treatment T3 caused maximum reduction of weed population and resulted into the lowest weed density at 30 DAS. Consequently, T3 led to the highest grain yield, net return and B/C ratio proving its advantages. The farmers accepted this treatments for next season application.

Management of weeds to increase Soybean yield

Table 6.6 Assessment of application of weedicide to increase Soybean yield

Treatments	Weed density (no.m^{-2})	Grain yield (kg/ha)	Gross Income (Rs/ha)	Cost of Cultivation (Rs/ha)	Net Returns (Rs/ha)	B/C ratio
T_1 (Hand Weeding)	37.4	901	40040	17860	22180	2.24
T_2 (Imazethapyr 10 SL @ 1.0 lit. per ha)	23.2	1190	54740	20985	33755	2.60
T3 (Sodium acifurofen 16.5% + Clodinofop-Propargyl 8%	21.3	1320	60720	22010	38710	2.75

KVK Yamunanagar

Problem definition: Lower yield of maize due to weed pressure

Technology Assessed: Atrazine 1250 g/ha (PRE) fb Tembotrione 287.5 ml/ha at 15-20 DAS

Source of Technology: PAU, Ludhiana

Weed Management in spring maize was assessed by KVK Yamunanagar. Use of Atrazine 1250 g/ha at 0-3 DAS (farmers practice-T1) and Atrazine 1250 g/ha (pre-em.) followed by Tembotrione 287.5 ml/ha at 15-20 DAS (T2) were tested. Higher yield was obtained under pre emergence application of atrazine 1250 g/ha *fb* early post emergence application of tembotrione 287.5 ml/ha at 15-20 DAS due to reduction is weeds population. The grain yield was 14.9 % under improved recommendation with higher B:C ratio (3.01) as compared to farmer's practice (2.69).

Integrated Crop Management

KVK Alwar-I

Problem definition: Difficult to sow bottle guard in field under low temperature

Technology Assessed: Seeding technology of bottle gourd for summer season

Source of Technology: IARI, new Delhi

The bottle gourd is usually sown in Feb-March by farmers in open fields, the germination of which often affected due to lower ambient temperature. An OFT was conducted to assess early seed sowing in polythene bags/ pro-trays on 15th January under protected structure transparent polythene sheet (30 micron thickness) covering low tunnel and transplanting on 25th February in the fields (T2) against farmers practice (T1- direct sowing of seeds in main field between 25th February to 5th March) at 10 farmers field of 50 sqm. The crop growth under T2 advanced by one month with 15.3% increase in production (225 q/ha) due to longer growth period. Higher price was also received by the farmers. The net return and B:C ratio were higher at Rs 21150 and 1:4.11, respectively under T_2 as compared to T_1 (Rs 168850 and 1:3.59). The farmers have received this practice well. During scientist farmers interactions 18 farmers of Khillora, Navgaon and Kanor villages agreed to adopt the technology in next season.

Problem definition: Flower and fruit drop of chilli in summer season due to high temperature

Technology Assessed: Management of Flower and fruit drop of chilli crop in summer season

Source of Technology: IARI, New Delhi

Flower and fruit drop of chilli in Alwar district is a serious problem of farmers during summer. An OFT was conducted involving application of auxin @ 10ppm twice at 45 and 60 days after transplanting (T2) at 10 farmers' fields in 100 sqm area vis-a vis farmer practice(T1 – frequent irrigation at short intervals). The treatment T2 increased remarkably number of fruits/ plant (41) and productivity (13400 kg/ha) over farmers practice (37 and 12100 kg/ha). The net return and B:C ratio was higher in T2 (Rs 159950 and 1:2.97 as compared to T 1(Rs 138050 and 1:2.73). The technology has been accepted by the farmers for adoption.

KVK Panipat

Problem definition: Heavy groundwater exploitation due to rice-wheat system

Technology Assessed: Muskmelon and Mustard as relay crop in R-W system

Source of Technology: IARI, New Delhi

An alternative of rice-wheat system is needed for crop diversification and increase the income of the farmers. The on-farm trial to assess productivity and profitability three cropping systems T1-rice (PB 1509) – wheat (HD 2967); T_2-rice (PB 1509)-wheat (HD 2967) - muskmelon and T_3-rice (PB1509) -mustard (P45S46) –muskmelon was conducted during 2023-24. The rice-mustard-muskmelon sequential cropping resulted into the highest wheat equivalent yield (WEY) with the highest net return and B: C ratio. The relay cropping of muskmelon in wheat increased the system productivity by 68.3 % over the rice-wheat cropping system. In another OFT, rice –wheat; rice- cole crop –wheat and rice- pea –muskmelon was tested at farmers' fields. The highest system productivity in terms of wheat equivalent yield of 333.1 q/ha was obtained under rice-pea-muskmelon system with net profit of Rs 421045/ha and B: C ratio 4.1 followed by rice-cole crop-wheat system (WEY 300.4 q/ha and B: C ratio 3.6), The lowest system productivity, net return and B:C ratio of 126.9 q/ha, Rs.173138 and 2.76, respectively were recorded in rice-wheat system. The system productivity in rice-pea-muskmelon was 162.5% higher than rice-wheat cropping system.

KVK Hanumangarh-II

Problem definition: Low seed germination, high disease and weed infestation

Technology Assessed: Assessment of plug tray for raising healthy seedlings of vegetables

Source of Technology: IARI, New Delhi

An OFT was conducted by KVK Hanumangarh - II to assess the plug tray for raising healthy seedlings of vegetables. Under T-1 Seedling is produced in flat bed as

practiced by the farmers; while under T-2 Seedling is produced in plug tray by improved method. The results of the trial clearly showed that seedling production in plug tray had more germination percent, low disease & weed infestation and days ready to seedling are minimum in comparison to seedling production in flat bed. Further, it is also recorded that the net income in and B:C ratio in improved method was Rs 26550 per ha and 2.05, respectively while in farmer practising method it was found Rs 10140 per ha and 1.62, respectively.

KVK Nagaur-II

An assessment trial was conducted by KVK Nagaur to assess the efficacy of mulching and drip irrigation on growth and yield of tomato. Under T-1 no use of mulching and drip irrigation as practiced by the farmers; while under T-2 use of drip irrigation and mulching was introduced. It was found that tomato yield increased by 23.7% (58.1q/ha) as compared to control group (47.0q/ha) earning net profit of Rs 69879 with B:C ratio of 4.1.

KVK Nagaur-II

Problem Definition: Higher mortality in tomato seedlings in nursery

Technology Assessed: Arka Microbial Consortium and pro tray in tomato seedling production

Source of Technology: IIHR, Bengalure

The Krishi Vigyan Kendra, Nagaur-II conducted on-farm trial on assessment of Arka Microbial Consortium and pro tray for healthy tomato seedling production. Seedling raising in pro tray and seed treatment with Arka Microbial Consortium and its spray had increased the seed germination (33.33%), reduced weed intensity (63.33) and time taken for nursery raising (40.63) along with net profit of Rs.18800/ha.

Table 6.7 Effect of Arka Microbial Consortium and pro tray for healthy tomato seedling production

Technology Option	No. of trials	Survival rate (%)	Net Returns (Rs./ha)	BC Ratio
Nursery raising in open field (Farmers Practice)	10	65	9200	1.75
Nursery raising in pro-tray and use of AMC as seed treatment and foliar spray		91	18800	2.32

KVK Sikar-II

Problem Definition: Low germination and seedling vigor leading to low survival in chilli

Technology Assessed: Arka microbial consortium on germination and growth of chili

Source of Technology: IIHR, Bengalure

KVK Sikar-II conducted an on-farm trial on the effect of the Arka microbial consortium on germination and growth of chilli. The results brought out that the growth of inoculated seedlings was significantly more compared to un-inoculated seedlings. Inoculating the substrate in pro-trays with microbial consortia results in minimum days to germination (8.70), maximum germination (86.50) and seedling length (11.74 cm).

KVK Sonipat

Problem definition: Low income from paddy- wheat rotation

Technology Assessed: Economic viability of Moringa Oleifera L. (moringa)

Source of Technology: TNAU, Coimbatore

KVK Sonipat conducted the trial on the domestication & assessment of economic viability of Moringa Oleifera L. (moringa) to introduce and to assess the economic viability of Moringa Oleifera L. (moringa) the plant variety PKM-1 were planted in March 2023 at three locations in the district. The income from Moringa Oleifera L. (moringa) was obtained as 45000/- Rs/ha as compared to rice wheat cropping system 123500 Rs/ha hence not achieved the expected income in the trial.

KVK Churu-I

Problem identified: Heavy incidence of Alternaria blight in Sesame

Technology Assessed: Thiophanate methyl for management of Alternaria blight in Sesame

Source of Technology: ICAR-IIOR, Hyderabad

Sesame accounts about 3837 ha area in Churu district. It is severely attacked by Alternaria blight resulting in defoliation of leaves and decrease in yield. The repeated use of same chemicals proving less effective against the disease. Farmers have been using higher dose of chemicals than recommended which has been causing hazardous effect on human as well as plant health. Spray of Mancozeb at appearance of disease symptom (farmers practice) and spray of Thiophanate methyl 70 WP @ 1ml/liter (at 35 & 50 DAS) were tested under OFT. The foliar application of Thiophanate methyl 70 WP @ 1ml/liter water managed the *Alternaria* blight in Sesame more efficiently and increase the yield by 21.3% with B:C ratio 2.62 and additional benefits of Rs 9600/ha over farmer's practice (2.26)

Integrated Pest & Disease Management

KVK Churu-I

Problem identified: Yield loss in mungbean due to pod borer

Technology Assessed: Emamection benzoate to manage pod borer in mung bean

Source of Technology: NCIPM, New Delhi

Mung bean (*Vigna radiata*) is an important pulse crop of Churu district grown on over 3.7 lakh ha. However, the productivity is very low at 364 kg/ha. One of the major reasons of low yield is pod borer causing about 35% loss in yield. In view of this, OFT with farmer's practice-Quinalphos 25 EC 1.2 ml/lit water (T1) and foliar application of Emamectin benzoate 5% SG @ 0.5g/lit water (T2) was conducted to control the pod borer. The foliar application of Emamectin benzoate 5% SG @ 0.5g/lit water managed the pod borer in mung bean more efficiently by reducing the incidence of pod borer and increase the yield 23.4 % with B: C ratio 2.60 and additional benefits of 8265/ha over farmer's practice (2.19).

KVK Alwar-I

Problem definition: Quantity and quality loss of ber fruits

Technology Assessed: Management of fruit flies in Ber

Source of Technology: ICAR-CIAH Bikaner

Alwar district covered more than 248 ha area under Ber orchards in which the fruit fly is a serious pest and heavy loss to the orchard owners. An OFT on IPM against fruit flies was conducted at Shekhambas village. The farmers of the village use to apply Melathion 50 EC 2 ml/ litre of water for control of fruit fly. The IPM module of deep summer ploughing+ 2 foliar spray of Dimethoate 30 EC @1 ml /litre of water with 0.5 per cent Jaggery solution + 25 pheromone trap per ha was applied. The first spray of chemical was done at flowering and second at fruit setting stage. The fruit flies infested 46.2% fruits under farmers practice which was reduced to 12.4 % under IPM module. Under IPM module, the production of non-infected fruits was 113.14 q/ha against 79.43 q/ha with farmers practice The IPM practices led to the higher net return and B:C ratio of Rs 203389/ha and 4.14, respectively against Rs 150003/ha and 3.65 with farmers practice. Due to good quality fruits that fetched better price, the farmers readily accepted the IPM module as evident during scientist farmers interactions wherein 20 farmers of Shekhambas, Navgaon and Ramgarh villages were ready to adopt the IPM technology in their ber orchards.

Problem definition: Yield loss due to heavy infection of

white rust and downy mildew in mustard

Technology Assessed: Integrated Management of white rust and downy mildew in mustard

Source of Technology: DRMR, Bharatpur

Mustard is cultivated on 3.50 lakh ha area in Alwar district of Rajasthan. The is often infected by white rust and downy mildew and other diseases causing up to 48% loss in yield. An OFT on IPM of white rust (*Albugo candida*) and downy mildew (*Peronospora parasitica*) was conducted at 10 farmers fields of 0.4 ha area each during 2022-2023. Seed treatment with metalaxyl (Apron 35 SD) @ 6 g/kg seed + one foliar spray of Ridomil MZ 72 WP @ 0.2 per cent after appearance of disease symptoms was tested along with farmers practice. The disease incidence reduced to 6.4% under improved package against 32.1% under farmers practice of no control measures adopted. The mustard yield increased of 15.6 % (19.81 q/ha) as compared to farmers practices 17.13 q/ha. The net return and B:C ratio in improved technology was Rs 91630 and 4.34, respectively as compared to Rs 78910 and 4.30 under farmer's practice. Farmers of village Bamboli and Mandapur have accepted the technology in mustard cultivation.

KVK Bundi

Problem Definition: Heavy infestation of fall army worm (FAW) in maize

Technology Assessed: Management of fall army worm in maize

Source of Technology: Indian Institute of Maize Research, Ludhiana

Maize is an important cereal crop of the Bundi district with 30,484 ha area. Since last 2-3 years FAW, (*Spodoptera frugiperda*) is becoming serious pest of maize in the district. Farmers of the district generally applied systematic insecticide. An assessment trial was conducted by KVK, Bundi during Kharif 2023 for the management of FAW in maize. The farmer's practice of spray of imidacloprid 17.8 SL at 300 ml/ha and spray of Emamectin benzoate 5 SG at 200 ml/ha was tested. The highest yield (3480 kg/ha), gross return (Rs. 72732/ ha) and B:C ratio (2.23) was obtained with spray of Emamectin benzoate 5 SG at 200 ml/ha. The spray of Emamectin benzoate 5 SG at 200 ml/ha reduced the damage of fall army worm from 33% to 18% leading to increase in yield by 33.3%.

KVK Fatehabad

Problem definition: Low yield in cotton

Technology Assessed: Assessment of insecticides to manage PBW in cotton

Source of Technology: CICR Sirsa

KVK, Fatehabad conducted on-farm trial to assess the application of insecticides in Bt cotton. Yield of cotton was higher (10.3 q/ ha) in T_2 over farmer practice (9.2 q/ha). The B:C ratio was 1.39 in case of T_2 as compared to 1.21 under farmer practice Table 6.8.

Table 6.8 Effect of insecticides on Bt Cotton at Fatehabad (Haryana) conditions

Technology Option	No.of trials	Yield (qtl./ha)	Increase in yield (%)	Gross Cost (Rs./ha)	Gross return (Rs./ha)	Net Return (Rs./ha)	B:C Ratio
Farmer practice T_1	10	9.2	-	53000	64400	11400	1.21
T_2 (I^{st} spray of Nimbecidine (0.3 %), 2^{nd} spray of Profenofos 50EC & 3^{rd} spray of Cypermethrin 25 EC		10.3	11.95	51800	72100	20300	1.39

Problem definition: Poor quality & low yield in paddy

Technology Assessed: Management of sheath blight in paddy

Source of Technology: PAU, Ludhiana

KVK, Fatehabad conducted on-farm trial to assess the application of fungicides in paddy. Yield of paddy was found higher (59.0 q/ha) in T_3 over T1 (57.9 q/ha) and farmer practice (55.8q/ha). The BC ratio was assessed higher (2.51) in case of T_2 as compared to T2 (2.46) and farmer practice T_1 (2.39).

Table 6.9 Impact assessment of fungicides on Rice under Fatehabad conditions

Technology Option	No.of trials	Yield (q/ha)	Increase in yield (%)	Gross Cost (Rs./ha)	Gross return (Rs./ha)	Net Return (Rs./ha)	B:C Ratio
T 1: Farmer practice T_1	5	55.8	-	77000	184140	107140	2.39
T2: Luster @ 1 ltr. per ha. at appearance of disease and repeat 15 days after first spray		57.9	3.76	77500	191070	113570	2.46
T3: Nativo @ 200 ml. per ha. at appearance of disease and repeat 15 days after first spray		59.0	5.73	77400	194700	117300	2.51

KVK, Gurugram

Problem Definition: Pink ball worm infestation in cotton

Technology Assessed: IPM module against pink ball worm in cotton

Source of Technology: Anand Agricultural University, Ahmedabad

Pink ball worm insect is a serious problem in cotton, especially in Pataudi block of district Gurugram of Haryana. The KVK Gurugram surveyed the areas, interacted with farmers and selected the cotton growing farmers of village Maujabad. The on-farm trials were conducted at 10 farmer's fields. Pheromone traps @ 25 number/ha + spray of Spinosad 45%SC@ 1ml /liter at flowering stage during 2nd week of August+ spray of Profenophos 40% + Cypermethrin 4% @ 1 ml/litre after 10 days of first spray. The IPM module increased the cotton yield by 27.0% over the farmers practice (one spray of cypermethrin 25% at flowering)with the net profit of Rs. 1,20250/ha.

KVK Hanumangarh-I

Problem Definition: Heavy infestation of pink bollworm in cotton effecting

Technology Assessed: Pheromone traps @ 40/ha with IPM practices.

Source of Technology: MKV, Parbhani

An OFT using various insecticides for pink bollworm management as practiced by the farmers and mass trapping of male adults of pink bollworms by installing pheromone traps @40/ha +IPM was conducted during 2023-24. The cotton yield increased by 15% (14.38 q/ha) as compared to farmers practices (12.5 q/ha) earning net profit of Rs 62290 with B:C ratio of 2.18.

IPM against pink bollworm in Bt.Cotton at village Dhaban, Hanumangarh

KVK Jaipur-1

Problem Definition: Infestation of Fruit Borer

Technology Assessed: Pheromone trap + Indoxacarb 14.5 SC against Tomato Fruit Borer

Source of Technology: NCIPM, New Delhi

Low yield of tomato reported owing to infestation of fruit borer. To manage this pest, farmers spray Profenofos 50 EC@1.0 ml/liter of water (after outbreak of pest) which is not very effective. To suggest an IPM module, KVK Jaipur-I conducted an OFT with Pheromone trap @ 2.0/acre (Monitoring) + Need based two sprays of Indoxacarb 14.5 SC @ 1.0 ml/liter of water at 15 days interval (1st spray before flowering). IPM module resulted into the lowest pest infestation score of 2.31% as compared to farmers' practice (14.2%). Larval populations were more than 3 larva/plant in farmer practice whereas less than 0.4 in recommended practice. The yield, net return and B:C ratio was 530 q/ha, Rs 3,09,750/ ha and 2.40, respectively under recommended IPM module which were much higher than farmer's practice (yield 460 q/ha, net return-Rs 2,44,000/ha and B:C ratio-2.13).

Problem Definition: Gummy Blight in muskmelon

Technology Assessed: Tebuconazole 50% + Trifloxystrobin 25%

Source of Technology: NCIPM, New Delhi

An OFT was conducted to manage gummy blight of muskmelon. Majority of farmers misdiagnose gummy stem blight incidence as infestation of fruit fly and use insecticide to manage the same. The farmers practice is spray of carbendazim 12%+ mancozeb 63% @ 2gm/lit after incidence of disease. A new technological recommendation of Tebuconazole 50%+ Tryfloxystrobin 25% @1gm/lit (1st spray in the last week of February and 2nd after 10 days) was tested. The disease incidence reduced to 3.5% under Tebuconazole 50%+ Tryfloxystrobin 25% application against 26% in farmers' practice. The yield of muskmelon was 260 q/ha, net return at Rs. 2,81,000/ha and B: C ratio 2.60 under tested technology against 220 q/ha, Rs. 2,12,000/ha and 2.15 with farmer practice.

KVK, Jaipur-II

Problem definition: Low yield of wheat

Technology Assessed: Biological control of termite in wheat

Source of Technology: SDAU Gujarat

Termites, pose great threat to wheat due to severe reduction in plant population. Until recently, termite control has largely relied on broad spectrum and persistent organochlorine insecticides. Application of these chemicals have serious limitations due to legal restrictions. KVK, Jaipur-II carried out on farm trial for assessment of eco-friendly management of termites in wheat through Metarrhizium anisopliae as biological control agents.

Table 6.10 Assessed Eco-friendly management of termite in Wheat **(2023)**

Technology Option	No.of trials	Yield (q/ha)	Cost of cultivation	Gross returns	Net returns	B: C ratio
Farmers Practice (T_1)	10	38.87	35140	114405	79196	3.26
Metarrhizium anisopliae		42.35	36180	125376	89196	3.47

Av. Sale rate @ RS 2075 Rs./qt. grain and 750 Rs./qt straw

KVK, Jalore-I

Problem Definition: Low quality of fruit in pomegranate due to thrips attack

Technology Assessed: Installation of blue sticky traps @ 50 traps/ha

Source of Technology: SDAU Gujarat

KVK, Jalore observed low quality of fruit in pomegranate due to thrips attack. An OFT comprising of spray of Spineturam 11.70 %SC@ 1 ml/ltr (farmers practice) and installation of blue sticky traps @ 50

traps/ha was conducted to control thrips in pomegranate. The incidence of thrips/3 tapping was 10.66 as compared to farmers practice incidence of thrips/3 tapping was 9.33, respectively.

KVK Jhunjhunu

Problem Definition: Sucking pest in clusterbean

Technology Assessed: Control measure for sucking pest in clusterbean

Source of Technology: NCIPM, New Delhi

Clusterbean is an important Kharif crop of Jhunjhunu district in Rajasthan. However, there is high incidence of sucking pest resulting in heavy yield loss. An on-farm trial was conducted to assess the control measure for sucking pest. Spray of Diamethoate 30 EC (farmers practice) and Spray of Thiamethoxam 25% WG (0.025 %) 30-35 DAS with+ 5% Neem Seed Kernel Extract (recommended practice) was tested. Incidence of sucking pest reduced with recommended practice over farmer practice. The yield of clusterbean was recorded at 1593 kg/ha which was 19.0% higher than farmer's practice. The net return of Rs. 49433.0 and B:C ratio of 2.35 was recorded with Thiamethoxam 25% WG and NSKE against Rs 37727 net return and 2.09 B:C ration under farmers practice.

KVK Kota

Problem Definition: Low yield of soybean due to severe incidence of foliage feeders

Technology Assessed: Beauveria bassiana against leaf eating caterpillars in soybean

Source of Technology: ICAR-IISR, Indore (MP)

Soybean is a major kharif crop with 1.88 lakh ha area in the Kota district. The incidence of leaf eating caterpillars (tobacco caterpillar, semilooper, pod borer etc.) result in sizeable yield loss. To avoid losses caused by these pests' microbial insecticide was used for on-farm testing (OFT). Spray of Beauveria bassiana ($1x10^8$ cfu) @ 1 liter/ ha after initial incidence of leaf eating caterpillars and 2nd Spray after 15 days interval reduced the larval population to 2.33/ meter row length against 4.0 larvae/m row length under farmers practices (4.00). The yield increased by 8% with net profit of Rs 38036 and B:C ratio of 2.11 in Beauveria bassiana treatment.

Chickpea has 49700 ha area in Kota district and is a major rabi pulses of the district. The incidence of collar rot disease causes severe mortality and yield losses in chickpea. An on-farm testing carried out to assess the efficacy of Trichoderma as soil and seed treatment for management of collar rot in chickpea during 2021-22 and 2022-23. The Results indicated that seed treatment with Trichoderma viride at 10 g/kg seed plus application of T. viride at 5 kg/ha multiplied on decomposed with 100 kg FYM at the time of sowing resulted the lowest mean disease incidence (3.25%) against 19.49% in farmers practice. The seed yield of 23.12 q /ha was recorded with Trichoderma viride treatment as compared to 19.20 q/ha under farmers practice. The net return and B:C ratio were also higher in Tricoderma treated plots during both the years. The farmers like to adopt this technology for future.

Management of leaf eating caterpillars in soybean-Village-Bagtari

KVK S. Madhopur

Problem Definition: Heavy infestation of phyllody disease in sesame in the district

Technology Assessed: Management of Phyllody disease in sesame crop

Source of Technology: AU, Jodhpur

The phyllody disease is a serious problem in sesame. An OFT to test the seed treatment with imidachloprid @ 5 ml/kg seed + spray of imidachloprid 17.8% SL @ 0.5 ml/ litre water at appearance of disease was conducted against farmers practice. Seed treatment with imidachloprid and spray of imidachloprid at appearance of disease recorded the least disease

incidence (7.3%), the highest seed yield (4.25 q/ha) and benefit cost ratio of 3.47.

KVK Udaipur-I

Problem Definition: Low yield of Ginger due to Rhizome rot disease

Technology Assessed: Soil and Seed Treatment and spray of Mancozeb+Metalaxyl in Ginger

Source of Technology: NCIPM, New Delhi

Ginger is a popular crop of Jhadol and Phalasiya blocks of Udaipur district of Rajasthan. However, increased incidence of rhizome rot has forced farmers to abandon the cultivation of ginger due to severe loss in yield. AN OFT was conducted to assess the efficacy of soil treatment, seed treatment and sprays of Mancozeb 64 % + Metalaxyl 4 %WP insecticide against farmer's practice foliar spray of M 45. The seed treatment of ginger stored for the next season was also done. Soil treatment with Trichoderma viridae (3kg / 100 kg FYM) + Seed treatment (Carbendazim 50% WP 2 gm / kg + Chloropyriphos 20 % EC WP 1 ml per kg + Streptocyclin 6 gm per 20 kg seed) + Soil drenching with Ridomil gold (2 gm/kg) (Mancozeb 64 % + Metalaxyl 4 %WP) and seed treatment with (Carbendazim 50% WP 2 gm/kg seed + Chloropyriphos 20 % EC 1 ml/kg seed) resulted into lowest infected plants at 16.3% against 65.2% under M 45 treatment. The germination, tillers/plant and suckers yield also improved considerably with integrated treatments.

Table 6.11 Effect of plant protection measures on Ginger under Udaipur conditions

Treatment details	Germination (%)	Tillers/ plant	Infected Plants (%)	Yield (t/ha)
T1-Farmer's practice (Foliar Spray with M-45)	59.38	8.7	65.2	4.07
T2-Soil treatment with Trichoderma viridae (3kg / 100 kg FYM) + Seed treatment (Carbendazim 50% WP 2 gm / kg + Chloropyriphos 20 % EC WP 1 ml per kg + Streptocyclin 6 gm per 20 kg seed) + Soil drenching with Ridomil gold (2 gm/kg) (Mancozeb 64 % + Metalaxyl 4 %WP) and finally put seed treatment with (Carbendazim 50% WP 2 gm/kg seed + Chloropyriphos 20 % EC 1 ml/kg seed)	84.29	17.75	16.3	14.42

Problem Definition: Low yield of Colocasia due to leaf blight and sucking pest.

Technology Assessed: Seed treatment + Soil drenching with mixture against bligt and pests

Source of Technology: NCIPM, New Delhi

Colocasia is a popular tuber crop of Jhadol and Phalasiya blocks of Udaipur district of Rajasthan. However, the attack of leaf blight and sucking pest have caused server dent to its cultivation. An OFT was conducted to identify the suitable treatment for leaf blight and sucking pest. By comparing the package (T2) of seed treatment and sprays of Mancozeb 64 % + Metalaxyl 4 %WP insecticide with farmer's practice of M 45. Seed treatment with thiophanate methyl 5 gm per kg seed + Soil drenching with mixture of (Mancozeb 64 % + Metalaxyl 4%WP) and need based spray produced the higher yield of 11.34 t/ha against 8.12 t/ha under farmers practice. The infection to plants reduced significantly to 19.3% with integrated treatment against 78.4% under farmers practice.

Table 6.12 Application of plant protection measures in Colocasia under Udaipur conditions

Treatment details	Plant infected Disease incidence (%)	Yield (t/ha)
T1-Farmer's practice (Foliar Spray with M-45)	78.39	8.12
T-2 Seed treatment with thiophenate methyl 5 gm per kg seed + Soil drenching with mixture of Mancozeb 64 % and Metalaxyl 4 %WP and need based spray	19.29	11.34

Problem Definition: Low yield of pea due to wilt

Technology Assessed: Seed treatment with *Trichoderma* and spray of thiophanate methyl.

Source of Technology: NCIPM, New Dehli

Pea is a cash crop of farmers of Jhadol and Phalasiya blocks of Udaipur district of Rajasthan. But with continuous attack of wilt in the crop, farmers have stopped the cultivation of pea facing heavy losses in yield. KVK Udaipur-I conducted an OFT to identify the suitable treatment for wilt. By comparing the package of seed treatment with Trichoderma and sprays of thiophanate methyl with farmer's practice of M 45. Treatment T2 was the most effective as it reduced the infection and increased the yield as compared to farmers practice.

Table 6.13 IPM in Pea under Udaipur conditions

Treatment details	Plant infected (%)	Yield (t/ha)
T-1 Farmer's practice (Foliar Spray with M-45)	71.33	1.34
T 2 Seed treatment with Trichoderma viridae @ 8 gm / kg seed and spray of thiophanate methyl @ 2 gm per litre of water	18.24	2.02

KVK Dungarpur

Problem Definition: Heavy infestation of shoot and fruit borer in okra

Technology Assessed: IPM against soot and fruit borer in okra

Source of Technology: TNAU, Coimbatore

KVK Dungarpur IPM module against fruit borer in okra. The farmers practice of 3-4 foliar applications of broad spectrum insecticide at short interval and installation of pheromone traps @ 10-12/ha + spray of neem based nimbicidine (1500ppm) @ 5ml/L followed by foliar spray of Emamectin benzoate 5% SG @ 150g/ha at ETL was tested. The okra yield was 123.4 q/ha under IPM treatments fetching the highest net returns of Rs. 160300/ha and B: C ratio of 3.03.

Natural Resource Management

KVK Churu-I

Problem Definition: Low yield of cluster bean under moisture stress

Technology Assessed: Foliar spray of TGA to manage moisture stress in cluster bean

Source of Technology: AU, Jodhpur

Cluster bean is the third important pulse crop after moth bean and mung bean in the district covering 212683 ha area. Scanty rainfall and long dry spell during monsoon season crop faces moisture stress resulting decrease in yield. To overcome this problem an on-farm trial was conducted with farmers to assess thio-glycolic acid (TGA) as a foliar application during moisture stress period in cluster bean especially at vegetative and flowering stage. Spray of TGA @ 100 ppm at vegetative and flowering stage managed the moisture stress in Cluster bean efficiently and increased the yield by 19.3% with B:C ratio 2.46 and additional benefits of Rs. 5805/ha over farmers practice (no use of chemical).

KVK Kaithal

KVK, Kaithal conducted on-farm trial to assess the performance of dry DSR and Vattar DSR. The results revealed an increase in paddy yield by 5.3 % in dry DSR (40.0 q/ha) over vattar DSR (38.0 q/ha). The net returns

and B: C ratio were higher in dry DSR (Rs. 123000/ha and 1.98) as compared to vattar DSR (Rs. 110600/ha; 1.88).

An OFT was also conducted in wheat to assess the performance of happy and super seeder in wheat. Wheat yield increased by 2.0% in treatment happy seeder (50.0 q/ha) over super seeder (49.0 q/ha). The net returns and B: C ratio were higher in happy seeder (Rs. 38750/ha and 1.50) as compared to super seeder (Rs. 32875/ha and 1.40), respectively.

KVK Panipat

Different tillage practice -T_1-broadcast sowing of wheat with rotary tillage, T_{2-} zero till sown wheat with zero till seed drill, T_3- zero till sown wheat with happy seeder and T_4- super seeder sown wheat were tested at farmers fields under OFT. The highest yield of wheat was recorded under super seeder sown wheat. The net return and B:C ratio was the highest under T_{2-} zero till sown wheat with zero till seed drill. The farmers have greater acceptability for super seeder for convenience of operations although economics favored for zero till drill sown wheat.

An on-farm trail was conducted to assess different tillage practices for sowing of wheat under combine harvested rice. The treatments included T_1- conventionally sown wheat after RI with rotavator/disc harrow and pre-sowing irrigation, T_2- super seeder sown wheat after RI with rotavator/disc harrow and pre-sowing irrigation, T_3- super seeder sown wheat after pre-sowing irrigation and T_4- super seeder sown wheat after baling and pre-sowing irrigation. The highest yield was observed in case of super seeder sown wheat after pre-sowing irrigation without any prior residue incorporation. The rice residue incorporation provides advantage to wheat crop and yield decline was observed wherein the straw was removed through baling.

OFT comprising T1 Rice (combine harvested) and sowing of wheat with super seeder and T2 Rice (combine harvested) –spray of waste decomposer and sowing of wheat with super seeder was conducted during 2023-24. Under T-2, 5% Pusa waste decomposer (10 ltr./200 ltr. water) was sprayed just before sowing/incorporation using super seeder. The wheat yield was at par in both treatment (T1-52.3 q/ha; T2-52.5 q/ha). The B:C ratio was 3.62 and 3.36 in T1 and T2, respectively. Waste decomposer could not prove beneficial in wheat crop.

Table 6.14 Assessment of waste decomposer integrated CRM in wheat sown with paddy straw incorporation

Treatments	Yield (q/ha)	Net returns (Rs/ha)	B:C Ratio
T1 Rice (combine harvested) and sowing of wheat with super seeder	52.3	86923	3.62
T2 Rice (combine harvested) –spray of waste decomposer and sowing of wheat with super seeder	52.5	84723	3.36

KVK Sonipat

OFT on resource conservation through direct seeding methods in paddy and zero tillage in Rice-wheat cropping system viz; T1-conventional sowing (transplanted rice + wheat) and T2-direct seeded rice followed by zero tillage was conducted. The direct seeding of rice enhanced the yield of paddy by 7.7 percent followed by zero tillage sowing of wheat and received increased in wheat yield by 11.0%. The labour requirement was 11 man-h/ha in T2 against 70 ma-hr/ha in conventional sowing. The system approach of DSR+Zero tillage in rice-wheat cropping system found suitable in adopted villages.

Livestock Production & Management

KVK Alwar-I

Problem Definition: Lack of proper management

Technology Assessed: Soil treatment of goat shed by butox @ 5%

Source of Technology: RAJUVAS Bikaner

Goat rearing specially for meat purpose is popular but farmers faced problem regarding poor weight gain

due parasites. A trial on management of parasites in goats has assessed with 10 farmers. Five mature goat/buck of 40-45 kg body weight were selected at each farmer using soil treatment of goat shed and use of wormicide. Framers in general do not use wormicide. The soil treatment of goat shed by butox @ 5 percent in March and after three months + Albandazol wormicide @ 10 ml on 50-60 kg body weight basis resulted into 4.9% higher body weight gain after 3 months of treatment as compared to 1.8% under farmer's practice.

KVK, Bundi

Problem Definition: Low weight gain and Higher mortality rate in Kids

Technology Assessed: Feeding mixtures to goat kids

Source of Technology: MPUAT, Udaipur

KVK, Bundi conducted OFT to find out suitable solution against low weight gain and mortality in goat kids. The farmers practice of solely grazing for 6-8 hours on community grazing land and feeding of kids with concentrate mixture at 1.5% of body weight along with grazing + deworming by Ivermectin 1 ml per 50 kg body weight + microbial feed additives (bio bloom) at 5 g per day per kid for 90 days was tested under farmers conditions. The body weight of goat kids increased @ 88.95 g/day with improved feeding and deworming practice against 45.14 g/day under farmers practice. The goat rearers feeding with 5g microbial feed supplement to kids per day can lead to 3.5 kg extra body weight gain in 90 days. Hence feeding of microbial feed supplement 5 g/kid/day is recommended to increase body weight and to check mortality rate in kids.

Problem Definition: Long calving interval in buffaloes

Technology Assessed: Post partum anoestrus in buffaloes.

Source of Technology: IVRI, Izatnagar

Feeding practice of farmers (wheat straw/paddy straw/green fodder + 2.5 kg cotton seed cake) and improved feeding of 2.5 kg concentrate up to 3 kg milk after that additional 33% concentrate per kg milk production + 50 gram mineral mixture + dewormer 0.5 g per 100 kg body weight + vitamin A 10 ml per animal (three dose on alternate day I/M injection.) was tested under OFT. The calving interval in buffaloes under improved feeding system was 400.2 days which is about 100 days less than farmers practice (500.2 days). The cost benefit ratio was highest under improved feeding system.

KVK Delhi

Problem definition: Parasitic infestation & problem of repeat breeding in buffaloes

Technology Assessed: Deworming and mineral supplementation in buffaloes

Source of Technology: SKNAU, Jobner, Rajasthan

Repeat breeding/anestrous and low milk yield in lactating buffaloes assessed by KVK Delhi using different feeding ingredients. Farmers practice-no deworming and no mineral mixture and deworming followed by mineral mixture supplementation @ 50 g/day/animal were tested. The buffaloes under deworming followed by mineral mixture supplementation yielded 10.5 lit/day milk as compared to 9.5 lit/day under farmers practice. The benefit:cost ratio was 1:15 under deworming and mineral mixture supplementation.

KVK, Hanumangarh-I

Problem definition: Low income from male goat rearing for meat purpose

Technology Assessed: Improved feeding complex in goats

Source of Technology: GADVASU, Ludhiana

KVK, Hanumangarh-I conducted trial to evaluate low cost and nutritious feed for growing goat kids in which moringa leaves were included in place of 50%

concentrate feed. Moringa leaves that have 18.23% CP, and 9.6 MJ/kg energy which improve the growth performance in goats. Feeding Moringa leaves increases goat body weight, reduce input cost, improve the digestion and absorption of nutrients in GI track.

KVK, Hanumangarh-II

Problem definition: Low body weight gain in buck (male goat)

Technology Assessed: Probiotics to improve growth performance in buck

Source of Technology: Marathwada Agricultural University, Parbhani

An OFT was conducted to find out the growth performance of buck at the age of 8 month. The balanced ration + probiotics @ 15gm per buck per day for 60 days improve the growth performance of buck. Probiotics along with balanced ration recorded 54.2 percent higher gain in body weight in buck as compare to farmers practice. The net profit was Rs 19.97/day with B:C ratio 1.82 due to 74% increase in body weight during 6 to 8 months age.

KVK Jaipur-I

Problem definition: Low milk yield and fat in crossbred cow

Technology Assessed: Feeding of By-Pass Fat (VF@ fat 100 gm/cow)

Source of Technology: NDDB, Gujrat

The poor feed management in cross bred cows causes low milk yield and longer inter-calving interval in crossbred cows as reported by the farmers. To suggest an alternative to farmers practice in feed management in cross bred cows, KVK Jaipur-1 assessed farmers existing feed management (available ingredients with farmer / prepared feed from the market-T1) vs (farmers practice + bypass fat 100 g /day/animal for 60 days-T2). The crossbred cows yielded the highest milk of 14.53 lit/day with the fat content of 3.80% under T2 against 13.37 lit/day with fat content of 3.6% under T1. The cost: benefit ratio was higher (1.77) in T2 as compared to T1 (1.64). Hence, feeding of 100 g bypass fat/day/animal is recommended for two months in a year.

KVK, Jhajjar

Low milk yield, short lactation period, late expression of heat/estrous cycle and poor conception of buffaloes due to poor nutrition was noticed in many villages in Jhajjar district. The KVK assessed feeding mineral mixture @ 50g/buffalo/day one month after parturition for 3 months against farmers practice of no mineral mixture. Feeding of mineral mixture one month and parturition for three months resulted in 10.5 per cent higher milk yield, 30 per cent higher expression of heat/estrous and 30 per cent more conception rate as compared to farmer's practice. Feeding of mineral mixture is recommended to increase milk yield and early expression of heat and successful conception in lactating buffaloes.

KVK Karauli

Problem definition: Mastitis disease in buffaloes causing low productivity and profit

Technology Assessed: Potassium permanganate ($KMNO_4$)+Povadin iodine solution

Source of Technology: ICAR-NDRI, Karnal

OFT on control of mastitis in buffaloes was done by KVK Karauli. Washing of udder with luke-warm water and washing with potassium permanganate ($KMNO_4$) solution+ Povadin iodine solution immediate after milking was tested. The buffaloes treated with $KMNO_4$ and Povadin iodine solution yielded the highest milk (11.55 lit having 7.10% fat) against farmers practice (10.30 lit having 5.26% fat). The net profit of Rs

410.4/animal/day and B:C ratio of 2.51 was recorded under $KMNO_4$ and Povadin iodine solution treated buffaloes as compared to 304.97/animal/day and 2.14 under farmer's practice.

KVK Karauli conducted an OFT on feed management in cows. Farmer practice (wheat straw + mustard cake) and Satawari Root powder @50 g/day/animal mixed with balanced concentrate mixture as per requirement was fed to two groups of cows. Feeding of buffaloes with satawari powder produced 10.60 lit/day milk yield which was 23.6% higher than farmers' practice (8.10 lit milk/day). The benefit: cost ratio was maximum in treated group (1.98) as compared to 1.77 under farmer practice.

KVK Karnal

Problem Definition: Low productivity in crossbred cows due to feeding issues

Technology Assessed: Polyherbal mixture in crossbred cow

Source of Technology: ICAR-NDRI Karnal

KVK Karnal assessed effect of herbal mixture supplementation on milk yield, its quality and economic viability in crossbred cow. The lactating crossbred cows (n=20) with similar milk yield, body weight and calving period were fed herbal mixtures @100g/day/animal for 90 days costing Rs 21/day/animal along with concentrates as well as another group of farmer's practice. The milk production increased by 27.6%, cost reduced by 15% and profit increased by 32.5% due to feeding of herbal mixture over farmer's practice. The polyherbal formulation supplementation has a beneficial effect on milk composition. The fat and SNF content in the milk of supplemented crossbred cows increase (4.1 vs 3.8%) and (8.6 vs 8.4%), respectively.

KVK, Kota

Problem Definition: Poor growth rate of goat kids

Technology Assessed: Supplementary feeding of goat kids

Source of Technology: ICAR-CSWRI, Avikanagar, Tonk

An OFT was conducted to assess supplementary feeding of goat kids for higher growth during 2022 and 2023. Results indicated that feed + 1.5 % concentrate on body weight basis recorded maximum mean body weight of 12.45 and 12.80 of 3 months goat kids and 19.60 and 23.25 of 6 months goat kids during 2022 and 2023, respectively. The percent increase in mean body weight was 2.8 and 18.6 for 3 months and 6 months goat kids over farmers practices during 2022 and 2023, respectively.

Another OFT to assess the efficacy of poly-herbal mixture on milk production and postpartum reproduction in Gir cows during 2022 and 2023 was conducted. The average milk yield of 9.5 lit/day was obtained under T2 which was 14.4% higher than farmers practices (8.3 lit/day). The timing of expulsion of placenta also lowered to 3.1 hrs and 3.0 hrs in treated cows against and 6.3 hrs and 6.5 hrs under farmers practice during 2022 and 2023, respectively.

Post-Harvest Management and Value Addition

KVK, Faridabad

Problem definition: Poor shelf life of whole pulses

Technology Assessed: Narrow neck plastic bottles to enhance shelf life of mungbean

Source of Technology: ANGRAU, Hyderabad

Effect of packaging in narrow neck plastic bottles on shelf life on mungbean was assessed by KVK Faridabad. Three groups were formed namely T_1- Storage in wide mouth plastic container; T_2- Storage in plastic zipper bags and T_3-Storage in narrow neck plastic bottles. The results of the study indicated that there was a maximum grain damage of 120 grains and presence of either dead or live dhora 30 in number per 100 gm of mungbean in treatment T_1 followed by T_2 group in which 35 grains per 100 gram of mungbean were found damaged along with the presence of 15 dhora in number. However, in T_3 group there was no presence of dhora and therefore no damaged grains were observed. Hence, it is evident that shelf-life of mungbean stored in narrow neck plastic bottles was better than other two treatments and therefore recommended to farmers for mungbean storage.

Which KVK is this?? Introduction of Hallur: Bajra flour with added gluten at household level. Hallur was introduced to 30 farm families for testing at household level. The results show that Hallur is better in kneading of dough and Chpati making as compared to traditional pearl millet flour. The Score of overall acceptability is higher 8.3 than traditional pearl millet flour 7.40.

Table 6.15 Cooking and taste characteristics of Traditional pearl-millet flour and Halur (Pusa Technology)

Parameter	Traditional Pearl-millet flour	Halur (Pusa Technology)
Ease in kneading of the dough#	1.8	3.9
Ease in rolling of *chapati*#	1.6	4.2
Puffing of *chapati*#	1.8	4.3
Appearance of *chapati*	2.5	4.1
Softness of *chapati*	1.7	3.5
Color	7.1	8.2
Taste	7.3	8.1
Flavor	7.5	7.6
Texture	6.9	7.8
Appearance	6.8	7.4
Overall acceptability	7.4	8.3

Note- Flour was judged on a scale of 1-5. The sensory evaluation was done using sensory score card with parameters viz. color, taste, flavor, texture, appearance and overall acceptability on 1-10 scale

KVK Jaipur-1

Problem Definition: Anemia in pregnant women

Technology Assessed: Intake of aonla green leafy balls to increase homoeoglobin level

Source of Technology: MPUAT, Udaipur

An Assessment Trial was conducted by KVK Jaipur-1 to improve the homoeoglobin level in pregnant women. Under T-1 treatment, pregnant women were fed only milk and house hold products such as dal, khichadi etc. as a weaning food- as a control group. Under T-2 treatment, aonla green leafy balls (prepared by aonla 1.0 kg + jaggery 750 gm + drumstick leaves 150 gm) was fed for 6 months daily. There was significant increase in body weight from 60 to 65 kg and improved Hb level 11.0 to 12.5 in comparison to f 8.5 under control.

Drudgery Reduction

KVK, Hanumangarh-II

Problem definition: Drudgery associated with cotton plucking activity

Technology Assessed: Cot bags for drudgery reduction

Source of Technology: CCSHAU, Hisar

An OFT was conducted to assess the effect of cot bags in lowering the drudgery of worm workers picking the cotton balls. The cotton balls plucking by using cot bag gave better results over traditional method.

KVK, Sawai Madhopur

Problem definition: Unhygienic and drudgeries in cleaning of cattle sheds

Technology Assessed: Cow dung collector

Source of Technology: ICAR-CIAE, Bhopal

An on-farm trial was conducted using cow dung collector, spade and khurpi. The cow dung collector helped reduce movability, backpain, dirty hands and foul smell of dung. The price of dung collector is Rs.300/- with efficiently works with results of heartbeat 70-110 and time taken was 8 minutes. This technology is very helpful for farmwomen in performing day to day cleaning of cattle sheds with less fatigue, save energy, time, reduce body pain and protects skin during winter.

Integrated Nutrient Management

KVK, Faridabad

Problem definition: Low yield and poor quality of Guava.

Technology Assessed: Balanced use of fertilizers on yield and quality of guava

KVK, Faridabad conducted OFT to assess the performance of yield of trees having the age of 12-14 years through application of doses of phosphorus, potassium and zinc fertilizer. The recommended dose of phosphorus along with other fertilizers gave 221 q/ ha yield whereas in case of farmers practice the yield was 192 q/ha. There was an increase of 15.1 per cent in yield where full recommended dose of fertilizers was applied in the orchards of Guava. B:C ratio of check trial was 1: 2.04 whereas the B:C ratio of recommended technology was 1:2.14

Table 6.16 Balance use of fertilizer in Guava (*Psidium guajava*)

Technology Option	No. of trials	Yield (q/ha)	Increase in yield (%)	Net Returns (Rs./ha)	B:C Ratio
One kg urea + 500 gm DAP per tree/year. (Farmer's practice)	5	192	-	246050	2.04
1.5 Kg Urea + 1.25 Kg SSP + 500 gram Potassium Sulphate+ 100 gram Zinc sulphate per tree/year		221	15.1	336700	2.14

Problem definition: Low yield and poor quality of ber fruits

Technology Assessed: Balanced use of fertilizers in Ber (*Zizyphus mauritiana)*

Source of Technology: CCSHAU,Hisar

KVK, Faridabad conduction On-Farm Trial to assess the performance of yield of ber cv. Umran of trees having the age of 14-16 years through application of doses of phosphorus fertilizer., Result showed that the recommended dose of phosphorus along with other fertilizers gave 320 q/ha yield whereas in case of farmers practice the yield was 275 q/ha. There was an increase of 16.36 per cent in yield whereas in case of farmers practice the yield whereas in case of farmers practice the yield was 275 q/ha. There was an increase of 16.36 percent in yield

where full recommended dose of fertilizers was applied in the orchards of Ber. B:C ration of check trial was 1:2.31 whereas the B:C ratio of recommended technology was 1:2.47.

Table 6.17 Balance use of fertilizer in Ber

Technology Option	No. of trials	Yield (q/ha)	Increase in yield (%)	Net Returns (Rs./ha)	B:C Ratio
FYM 20 kg and Urea - 1 Kg per tree (Farmer's practice)	5	275	-	237495	2.31
FYM-50 kg, Urea- 1.25 kg & SSP- 2.5 kg per tree		320	16.4	310750	2.47

KVK, Fatehabad

Problem definition: Low yield in DSR

Technology Assessed: Foliar application of $ZnSO_4$ in DSR

Source of Technology: PAU, Ludhiana

KVK, Fatehabad conducted on-farm trial to assess the foliar application of $ZnSO_4$ in DSR. Yield of rice was higher (62.3 q/ha) with the spray of zinc sulphate over no foliar spray (60.5 q/ha). The BC ratio was 2.84 in zinc fertilized plots against 2.78 under farmers practice.

Table 6.18 Application of Zinc in DSR at Fatehabad conditions

Technology Option	Trials	Yield (q/ha)	Increase in yield (%)	Gross Cost (Rs./ha)	Gross return (Rs./ha)	Net Return (Rs./ha)	B:C Ratio
Farmer's practice (no spray)	08	60.5	-	76000	211750	135750	2.78
Two foliar spray of Zinc sulphate @ 0.5 %		62.3	2.97	76700	218050	141350	2.84

KVK, Hanumangarh-I

Problem definition: Low quality and yield in Kinnow.

Technology Assessed: KNO_3 nutrition in Kinnow

Source of Technology: IARI, New Delhi

KVK, Hanumangarh-I assess the technology of nutrient management by the foliar application of potassium nitrate. No foliar spray as practiced by the farmers and three foliar spray of KNO3 @ 0.1% in the end of May, June & July month. It was found that the assessed technology had enhanced the yield by 6.9 per cent compared to farmer's practice.

KVK, Jaislamer

Problem definition: Low Productivity of cumin due to no use of micronutrient

Technology Assessed: Management of Micro Nutrient in cumin crop

KVK, Jaislamer assessed the micronutrient management practice in cumin. No use of micronutrients (Farmers Practice) was assessed with 5 ton compost + 36 kg N ha^{-1} + 26 Kg P ha^{-1} + 18 kg K ha^{-1} (Recommended Practice) and 10 kg Zinc Sulphate + 7.5 Kg Sulphur (90 % WG) 30 DAS + 0.5 % Ferrous sulphate at the time of flowering + 10-15 ton FYM + 30 kg N ha^{-1} + 20 Kg P ha^{-1} + 15 kg K ha^{-1}. The assessed practice of 10 kg Zinc Sulphate + 7.5 Kg Sulphur (90 % WG) 30 DAS + 0.5 % Ferrous sulphate at the time of flowering + 10-15 ton FYM + 30 kg N ha^{-1} + 20 Kg P ha^{-1} + 15 kg K ha^{-1} gave 31.7 % increase in yield of cumin over the farmers' practice .

KVK, Jalore-I

Problem definition: Fruit Cracking in pomegranate

Technology Assessed: Micronutrient mixture application in pomegranate

Source of Technology: NRCP. Solapur

KVK, Jalore-I conducted OFT to find out solution against fruit cracking in pomegranate. The OFT included spray of borex 0.2-0.3% and spraying of gypusum 2 kg/plant or Boron 0.25% +Gibberellic acid 50 ppm in soil application. The net return of Rs 542600 /ha with B:C ratio of 5.40 was noticed in micronutrient mixture as compared to farmers practices (Rs 408400/ha and B:C ratio of 4.71).

KVK Sirsa

Problem definition: Low productivity and fruit size in Kinnow

Technology Assessed: Nutrient management in kinnow

Source of Technology: PAU, Ludhiana

The impact of micronutrient application was assessed in kinnow by spraying of ZnSO4 @ 4.7 g/lt water + Manganese sulphate 3.3 g/lt water during end of April and mid-August vs farmer's practice (spray zinc sulphate @ 0.5% in May-June and August-September). The combination of two micronutrients enhanced the fruit yield to 260 q/ha against 210 q/ha under local practice. The cost: benefit ratio was also higher with zinc and manganese spays (3.44). Farmers accepted the usefulness of micronutrients management in kinnow for harvesting good quality fruits with higher yields.

KVK Dungarpur

Problem definition: Leaf curl in chilli causing severe yield and income loss

Technology Assessed: IPM package against leaf curl virus in Chilli

Source of Technology: PDKV, Akola

An OFT was conducted by KVK Dungarpur to assess the management of leaf curl disease in Chilli. Under T-1 Spray of Dimethoate30EC@1-1.250L/ha as practiced by the farmers and under T-2 Improved-Seed treatment with imidacloprid 70WS@ 10g/kg seeds and use of yellow sticky strips @12/ha along with destruction of infected plants+ spray with neem oil (1500ppm)@ 5ml/lit + spray of Pyriproxyfen 10EC @ 500ml/ha and repeat at 15 days interval. The chilli yield increased by 42.0 (16.22 t/ha) as compared to control group (11.42 t/ha) earning net profit of Rs 425700 with B:C ratio of 3.99.

Problem definition: Early blight of tomato causing 30-40% yield loss

Technology Assessed: Management of early blight of tomato

Source of Technology: UAS, Bangaluru

KVK Dungarpur conducted an OFT on management of early blight in Tomato. Spray of Mancozeb 75 WP@ 1.0kg/ha (farmers practice) and improved-soil treatment with FYM enriched *Trichoderma harzianum* (2 kg in 50 kg FYM) + spray of Azoxystrobin 11% +Tebuconazole 18.3% SC @ 750ml/ha at the initiation of infestation and repeat at 15 days interval was tested. The tomato yield increased by 47.2% (37.96 t/ha) as compared to control (25.42 t/ha) earning net profit of Rs 534200/ha with B:C ratio of 3.37.

CHAPTER 7

FRONTLINE DEMONSTRATIONS

Front line Demonstrations (FLD) provides direct interface between researcher and farmers. It offers opportunity to researchers and extension personnel for understanding the farmers' resources apply the suitable technologies under the package for easy adoptability. In Zone-II, 66 KVKs have been involved in conducting the FLDs under the supervision of ICAR-ATARI, Jodhpur. Along with FLDs, field days, trainings, workshops, seminars, farmers-scientist's interaction etc. were also conducted to facilitate interactions between researchers, extension workers and farmer. During 2023, total 23475 FLDs were conducted. It comprised of 20224 on crops, 1388 of kitchen gardening, 1226 on animal husbandry and dairying, 185 on farm implements and 290 on miscellaneous activities. These FLDs covered 10743.15 ha area and 1947 livestock units (Table 7.1).

Table 7.1 Achievements of FLDs Conducted during 2023 by KVKs of ICAR-ATARI, Jodhpur

S. No.	Crops/Commodities	Rajasthan		Haryana & Delhi		Zone Total	
		Farmers	Area (ha)/Units (number)	Farmers	Area (ha)/Units (number)	Farmers	Area (ha)/Units (number)
A	**Field Crops**						
1	Cereals	1803	675.5	3565	1515	5368	2190.5
2	Pulses (NFSM)	748	324.3	130	66	878	390.3
3	Pulses (Others)	1492	648.2	464	187.4	1956	835.6
4	Millets	763	464.77	148	57.2	911	521.9
6	Oilseeds (NMOOP)	6169	2625	2305	939.25	8474	3564.25
7	Oilseed (Others)	420	178.5	49	20	469	198.5
8	Fodder crops	127	24	100	27.5	227	51.5
9	Commercial crops	0	0	149	59.6	149	59.6
B	**Horticultural crops**						
10	Fruits	23	9	30	12	53	21.0
11	Vegetables	577	106.2	207	75.1	784	181.3
12	Flowers	0	0	10	2	10	2.0
13	Medicinal Crops	35	14	0	0	35	14.0
14	Seed Spices and others	260	103.9	10	1	270	104.9
15	Miscellaneous Crops	546	231	94	37.6	640	268.6
	Total Crops	**12963**	**5404.37**	**7261**	**2999.65**	**20224**	**8403.95**

S. No.	Crops/Commodities	Rajasthan		Haryana & Delhi		Zone Total	
		Farmers	Area (ha)/Units (number)	Farmers	Area (ha)/Units (number)	Farmers	Area (ha)/Units (number)
C	**Livestock and Fisheries**						
16	Dairy	996	239	230	280	1226	519.0
17	Goatary	220	11	0	0	220	11.0
18	Poultry	130	1087	32	320	162	1407.0
19	Fisheries	10	10		0	10	10.0
	Total Livestock/Fisheries	**1356**	**1347**	**262**	**600**	**1618**	**1947**
D	**Agri Engineering, nutrition**						
20	Farm implements	5	2	180	162	185	164.0
21	Kitchen gardening	805	104.25	583	63.95	1388	168.2
22	Nutrition and Drudgery Reduction	0	0	60	60	60	60.0
	Total Agri Engineering/Nutrition	810	106.25	823	285.95	1633	392.2
	Grand Total	**15129**	**6857.62**	**8346**	**3885.6**	**23475**	**10743.15**

Cluster Front Line Demonstrations (CFLDs) on Pulses

During Kharif-2023 and Rabi-2023 CFLDs were organized in participatory mode under various farming environments. An area of 390.3 ha was covered with active involvement of 878 farmers under Pulses demonstrations in Rajasthan and Haryana including Blackgram, Pigeonpea and Lentil crops. (Table 7.2)

Table 7.2 Summary of Progress Report of CFLDs on Pulses during 2023-24

S. No	Crops (Number of KVKs)	State	Target of CFLDs		Achievements of CFLDs		Average yield (kg/ha)		Yield increase (%)	Yield gap (kg/ha)
			No. of Demos	Area (ha)	No. of Demos	Area (ha)	Demo	Local		
Kharif season										
1	Blackgram (15)	Rajasthan	4000	1600	673	286.8	674	541	24.73	133
2	Pigeonpea (1)	Haryana	500	200	19	10	1700	1350	25.93	350
Total/avg.			4500	1800	692	296.8	1187	946	25.33	242
Rabi season										
3	Lentil (3)	Rajasthan	375	150	75	37.5	1872	1477	26.74	395
		Haryana	375	150	111	56	1000	726	37.74	274
Total/avg.			750	300	186	93.5	1436	1102	32.24	335
Grand Total/Avg. (Kharif+Rabi)			**5250**	**2100**	**878**	**390.3**	**1312**	**1024**	**28.79**	**289**

'Pratap Urd-1' under CFLD in Chittorgarh (Rajasthan)

Blackgram

Total 673 demonstrations were conducted in 286.8 ha in Rajasthan (Table 7.3). The highest average yield of 865 kg/ha was recorded in Baran district with Kota Urd-4 blackgram. The average yield in CFLDs was 674 kg/ha which was 24.7% higher than the yield of blackgram obtained with farmers' practice (541 kg/ha).

Table 7.3 Performance of Blackgram under CFLDs during Kharif 2023

S.No.	District/KVKs	Variety (s)	Area (ha)	CFLDs	CFLDs yield (kg/ha)	Local (kg/ha)	Percent increase
1.	Sawai Madhopur	Pratap urd-1	20.00	50.00	400	356	12.4
2.	Chittorgarh	Pratap urd-1	30.00	75.00	575	490	17.4
3.	Rajsamand	Pratap urd-1	20.00	50.00	624	541	15.3
4.	Tonk	Pratap urd-1	40.00	80.00	720	520	38.5
5.	Bundi	Kota urd-3	20.00	50.00	744	645	15.4
6.	Baran	Kota urd-4	30.00	75.00	865	680	27.2
7.	Kota	Kota urd-4	40.00	50.00	575	429	34.0
8.	Banswara	Mukundra urd -2	16.80	56.00	810	630	28.6
9.	Dungarpur	Mukundra urd -2	20.00	62.00	714	552	29.4
10.	Pratapgarh	Mukundra urd -2	20.00	50.00	840	701	19.8
11.	Udaipur-I	Mukundra urd -2	30.00	75.00	550	410	34.2
	Total/Avg.		**286.8**	**673**	**674**	**541**	**24.7**

Pigeonpea

During Kharif-2023, 19 CFLDs were conducted on pigeonpea variety Pusa Arhar 2018-4 on 10 ha area by KVK Gurugram of Haryana (Table 7.4). The average yield in demonstration was 1700 kg/ha with 25.9% increase over farmers' yield (1350 kg/ha).

Table 7.4 performance of Pigeonpea under CFLDs during 2023-24

S.No.	District/KVKs	Variety (s)	Area (ha)	CFLDs	CFLDs yield (kg/ha)	Local (kg/ha)	Percent increase
1	Gurugram	Pusa Arhar 2018-4	10	19	1700	1350	25.9

'Pusa Arhar 2018-4' under CFLDs in Gurugram (Haryana)

Lentil

During rabi-2023-24, 75 CFLDs on variety KM-3 at 37.5 ha area in Sawai Madhpur district of Rajasthan and 15 CFLDs on 6 ha and 96 CFLDs on 50 ha involving lentil varieties LL-1373 and L-4717 were conducted in Yamunanagar and Ambala districts of Haryana, respectively. The lentil yield of 1291 kg/ha was recorded under CFLDs which was 34.1% higher than the yields obtained with farmers practice (976 kg/ha).

Table 7.5 Performance of Lentil under CFLDs during Rabi 2023-24

S.No.	District/KVKs	Variety	Area (ha)	CFLDs	CFLDs yield (kg/ha)	Local (kg/ha)	Percent increase
1	Sawai Madhopur	KM-3	37.5	75	1872	1477	26.7
2	Yamunanagar	LL-1373	6.0	15	1207	877	37.6
3	Ambala	L-4717	50.0	96	794	575	38.0
Total/Avg.			**93.5**	**186**	**1291**	**976**	**34.1**

'Kota Masoor 3' lentil under CFLD in Sawai Madhopur (Rajasthan)

Pulse (other than NFSM)

FLDs on pulse production technology were organized on an area of 835.6 ha involving 1956 farmers in Rajasthan, Haryana & Delhi. The FLDs on blackgram and greengram in Kharif and mothbean and chickpea in rabi season were conducted (Table 7.6).

Table 7.6 Performance of FLDs on Pulse Crops in Rajasthan, Haryana and Delhi

Crops (KVKs)	Theme	No. of farmers	Area (ha)	Weighted Mean			BCR	
				Demo yield (kg/ha)	Local check (kg/ha)	Increase in yield (%)	Demo	Check
Rajasthan								
Blackgram(3)	ICM	136	31.4	615	516	19.2	1:2.28	1:2.11
Greengram(12)	ICM	630	309.5	741	612	21.4	1:3.14	1:2.80
Mothbean(3)	ICM	80	32.0	445	379	17.3	1:2.03	1:1.84
Chickpea(12)	ICM	646	275.3	1589	1339	19.0	1:2.71	1:2.19
Haryana								
Chickpea(4)	ICM	49	21.4	1252	1040	24.2	1:3.07	1:2.43
Greengram(4)	ICM	415	166.0	898	792	15.9	1:2.97	1:2.79

Blackgram: In Rajasthan, 3 KVKs (Rajsamand, Sirohi and Udaipur-II) conducted FLDs on blackgram at 136 farmers' fields covering an area of 31.40 ha. The highest yield of 615 kg/ha was recorded under ICM whereas 516 kg/ha under local check. FLDs resulted into 19.2% higher yield than local practice.

Greengram: 12 KVKs (Alwar-II, Barmer-I, Churu-I, Jaipur-I, Jalore-I, Jalore-II, Nagaur-II, Pali-I, Pali-II, Sikar-I, Sirohi and Sri Ganganagar) conducted demonstrations on green gram at 630 farmers' fields covering an area of 309.5 ha. The highest yield of 741 kg/ha was recorded under ICM against 612 kg/ha with

local practice. The yield advantage of 21.4% was recorded in FLDs over check. In Haryana, 4 KVKs (Bhiwani, Faridabad, Fatehabad and Hisar) conducted FLDs at 415 farmers' fields on 166.0 ha. The highest yield of 898 kg/ha was recorded under ICM whereas 792kg/ha under local check. The yield under FLDs was 15.9% higher over local check.

Mothbean: Barmer-I, Churu-I and Jaisalmer-I conducted FLDs on Mothbean at 80 farmers' fields on 32.0 ha area. Under ICM yield was 445 kg/ha while in local check yield was 379 kg/ha.

Chickpea: The FLDs on chickpea were conducted by 12 KVKs of Rajasthan (Churu-I, Dausa, Hanumangarh-I, Jaipur-I, Jaisalmer-I, Jhalawar, Rajsamand, Sawai Madhopur, Sikar-II, Sri Ganganagar, Udaipur – I and Udaipur-II) and 4 KVKs of Haryana (Ambala, Bhiwani, Fatehabad and Hisar). The highest yields of 1589kg/ha was recorded under ICM against 1339 kg/ha with local check in Rajasthan and 1252 kg/ha under ICM against 1040 kg/ha under local check in Haryana (Table 7.6).

CFLDs on Oilseeds

Total 8474 FLDs on different oilseed crops in cluster approach were conducted on 3564.25 ha in Rajasthan, Haryana and Delhi. The crop wise summary is given in Table 7.7.

Table 7.7 Summary of CFLDs on Oilseed during 2023-24

S.No.	Crops (Number of KVKs)	States	Achievements of CFLDs		Average yield (kg/ha)		Yield increased (%)	Yield gap (kg/ha)
			CFLDs	Area (ha)	CFLDs	FPs		
	Kharif season							
1	Groundnut (16)	Rajasthan	1101	430.40	2322	1900	22.8	422
2	Sesame (23)	Rajasthan	1149	514.60	492	376	31.4	116
3	Soybean (13)	Rajasthan	813	320	1556	1266	23.7	290
Total			3063	1265				
	Rabi season							
1	Rapeseed & Mustard (46)	Rajasthan	3106	1360	1807	1479	22.8	328
2	Rapeseed & Mustard (18)	Haryana	2180	889.25	1841	1609	15.8	232
3	Rapeseed & Mustard (1)	Delhi	125	50	1950	1600	21.9	350
Total			5411	2299.25				
Grand Total			**8474**	**3564.25**				

Groundnut

During Kharif 2023-24, 1101 demonstrations on groundnut were conducted at 430.40 ha in Rajasthan. The highest yield of 3030 kg/ha was recorded in the Churu district (KVK Churu-I) under CFLDs of 'GJG-19' groundnut. Overall CFLDs resulted average yield of 2322 kg/ha as compared to the 1900 kg/ha under farmer's practice (FPs). The increase in yield was 22.8% in CFLDs (Table 7.8). The highest intra-variety difference of 10.6% in GJG-19 was noticed in Churu district. On average, 422 kg/ha yield advantage was achieved by CFLDs adding to farmers' income by Rs. 28092.0/ha.

Table 7.8 Performance of groundnut under CFLDs during 2023-24

S. No.	Districts	KVKs	Variety (s)	Area (ha)	CFLDs (Numbers)	Yield CFLDs (kg/ha)	Yield FPs (kg/ha)	Percent increase
1	Alwar	Alwar-II	GJG-19	30	75	2165	1583	36.7
2	Barmer	Barmer-II	GJG-19	30	75	2390	1980	20.7
3	Bikaner	Bikaner-I	GJG-19	30	75	2553	2105	21.3
		Bikaner-II	GJG-19	30	75	2350	1815	29.5
4	Chittorgarh	Chittorgarh	GJG-32	20	75	1740	1420	22.5
5	Churu	Churu-I	GJG-19	30	75	3030	2506	20.9
		Churu-II	GJG 19	30	75	2710	2240	21.0
6	Dausa	Dausa	GJG-19	30	75	1992	1710	16.5
7	Hanumangarh	Hanumangarh-II	RG 510	30	75	2660	2250	18.2
8	Jaisalmer	Jaisalmer- II	GJG 19	10	25	2080	1628	27.8
9	Jodhpur	Jodhpur-I	GJG-19	30	75	2468	2051	20.3
		Jodhpur-II	GJG-19	30	75	2450	2037	20.3
10	Nagaur	Nagaur-I	Girnar-2	20	50	2412	2034	18.6
		Nagaur-II	HNG-123	30	75	2240	1867	20.0
11	Sri Ganganagar	Sri Ganganagar	HNG-69	20.4	51	2420	2060	17.5
12	Udaipur	Udaipur -I	GJG- 32	30	75	1490	1120	33.0
Total				**430.40**	**1101**	**2322**	**1900**	**22.8**

'GJG-19' Groundnut under CFLD at farmers field in Bikaner (Rajasthan)

Sesame

During Kharif 2023-24, total 1149 demonstrations on sesame were conducted on 514.6 ha in Rajasthan. The highest yield of 716 kg/ha of sesame variety RT-351 was recorded under CFLDs in Hanumangarh district. The average yield of 492kg/ha was registered in CFLDs against 376 kg/ha under FPs with an increase of 31.4% (Table 7.9). The intra-variety and intra-district variation of sesame ranged from 10.6% in the Bhilwara to 39.2% in the Alwar district. On average, 116 kg/ha yield farmers' and Rs. 10428.43/ha income advantage were achieved under CFLDs of sesame as compared to FPs.

Table 7.9 Performance of CFLDs on Sesame

S. No.	Districts	KVKs	Variety (s)	Area (ha)	CFLDs (numbers)	Yield (Kg/ha)		Percent increase
						CFLDs	FPs	
1	Ajmer	Ajmer	RT-351	5	10	482	384	25.5
2	Alwar	Alwar-I	RT 351	20	40	467	395	18.2
		Alwar-II	RT-351	10	25	340	240	41.7
3	Bhilwara	Bhilwara-I	RT 351	30	75	530	420	26.2
		Bhilwara-II	RT 351	30	75	575	470	22.3
4	Bikaner	Bikaner-I	RT-351	20	50	441	369	19.5
		Bikaner-II	RT-351	20	50	440	320	37.5
5	Churu	Churu-I	RT-351	30	75	462	318	45.3
		Churu-II	RT-351	30	50	510	390	30.8
6	Dholpur	Dholpur	RT-351	30	75	529	411	28.8
7	Hanumangarh	Hanumangarh-I	RT-351	30	75	716	496	44.4
8	Jaisalmer	Jaisalmer-I	RT-351	34.8	87	529	341	55.1
		Jaisalmer-II	RT-351	10	25	375	282	33.0
9	Jodhpur	Jodhpur-II	RT- 351	20	25	472	361	30.8
10	Nagaur	Nagaur-II	RT-351	10	25	430	352	22.2
11	Pali	Pali-I	RT 351	20	40	453	360	25.8
12	Sawai Madhopur	Sawai Madhopur	RT-351	30	60	445	336	32.4
13	Sri Ganganagar	Sri Ganganagar	RT-351	14.8	37	629	497	26.6
14	Tonk	Tonk	RT-351	20	40	520	400	30.0
Total				**514.6**	**1149**	**492**	**376**	31.4

'RT-351' Sesame under CFLDs in Tonk (Rajasthan)

Soybean

Total of 813 demonstrations on soybean were conducted on 320 ha in different districts of Rajasthan during 2023-24 (Table 7.10). The highest yield of 1808 kg/ha under CFLDs was recorded in Banswara district under soybean variety JS-20-29. The average yield under CFLDs was 1556 kg/ha as compared to the 1266 kg/ha achieved with FPs registering an increase of 23.7%. The CFLDs resulted in higher net return of Rs. 44909.4/ha against Rs. 32086.4/ha with FPs. On average, 290 kg/ha yield and Rs. 12823.0/ha income advantage with CFLDs over FPs was recorded.

Table 7.10 Performance of CFLDs on Soybean

S.No.	Districts/KVKs	Variety (s)	Area (ha)	CFLDs (numbers)	Yield CFLDs (kg/ha)	Yield FPs (kg/ha)	Percent increase
1	Banswara	JS-20-29	20	50	1808	1480	22.2
2	Baran	JS 20-98	30	75	1715	1270	35.0
3	Bhilwara-I	JS 20 34	20	52	1590	1305	21.8
4	Bundi	JS 20-98	20	50	1404	1204	16.6
5	Chittorgarh	JS 20-98	40	100	1610	1340	20.2
6	Dungarpur	JS 20-29	20	57	1540	1215	26.8
7	Jhalawar	JS-20 98	30	75	1475	994	48.4
8	Kota	JS 20-34	30	75	1511	1303	16.0
9	Pratapgarh	JS-20 34	30	75	1740	1520	14.5
10	Rajsamand	JS-20 34	20	50	1598	1320	21.1
11	Sawai madhopur	JS-20 34	20	50	1460	1228	18.9
12	Udaipur-I	JS-20 34	20	50	1190	910	30.8
13	Udaipur-II	JS 20 34	20	54	1590	1370	16.1
Total			**320**	**813**			

Mustard

In mustard, 3106 CFLDs were conducted on 1360 ha in Rajasthan; 2180 CFLDs on 889.25 ha in Haryana; and 125 CFLDs on 50 ha in Delhi during 2023-24 making total 5411 demonstrations on 2299.25 ha in the three states.

Rajasthan: The highest yield of 2490 kg/ha was observed with mustard variety RH-725 under CFLDs in Karauli district. On an average, 1807 kg/ha mustard yield was achieved in CFLDs as compared to the 1479 kg/ha with FPs registering an increase of 22.8 % (Table 7.11). The CFLDs resulted in higher net return (Rs. 68816.81/ha) than FPs (Rs. 51888.6/ha). The yield advantage of 328 kg/ha was achieved by CFLDs adding to farmers' income by Rs. 16928.26/ha.

Table 7.11 Performance of CFLDs on Mustard in Rajasthan

S.No.	Districts/KVKs	Variety (s)	Area (ha)	CFLDs (No.)	Yield (kg/ha)		Percent increase
					CFLDs	FPs	
1.	Ajmer	DRMR 2017-15	30	75	1874	1397	34.1
2.	Alwar-I	DRMR 2017-15	20	50	1930	1660	16.3
3.	Alwar-II	DRMR 1165-41	40	100	1613	1440	12.0
4.	Baran	DRMR 2017-15 DRMR 1165-40	20	50	1810	1540	17.5
5.	Barmer-I	DRMR 2017-15	30	75	1292	1054	22.6
6.	Barmer-II	PM-30	30	50	1630	1320	23.5
7.	Bharatpur	DRMR 2017-15 DRMR-1165-40	10	31	2022	1742	16.1
8.	Bhilwara-I	RH 725	30	75	1650	1360	21.3
9.	Bhilwara-II	RH 725	30	75	1660	1385	19.9
10.	Bikaner-I	DRMR-1165-40	40	100	1602	1333	20.2
11.	Bikaner-II	RH-725	40	100	2135	1671	27.8
12.	Bundi	Pusa Mustard 32	40	80	1525	1282	19.0
13.	Chittorgarh	RH-761	30	75	1830	1510	21.2
14.	Churu-I	CS-60	30	75	1596	1323	20.6
15.	Churu-II	DRMRIJ-31	20	50	1750	1470	19.1
16.	Dausa	DRMR 2017-15, DRMR-1165-40	30	75	2052	1700	20.7
17	Dholpur	DRMR1165-42	40	100	2170	1827	18.8
18.	Dungarpur	DRMR 2017-15	30	75	1229	1008	21.9
19.	Hanumangarh-I	RH-725	50	50	1755	1534	14.4
20.	Hanumangarh-II	RH 725	20	40	1840	1520	21.1
21	Jaipur-I	DRMR 2017-15	30	50	2246	1863	20.6
22.	Jaipur-II	DRMR 2017-15	20	50	2045	1835	11.4
23.	Jaisalmer-I	RH 761	30	75	1527	1230	24.2
24.	Jaisalmer-II	RH 725	20	50	1630	1265	28.9
25.	Jalore-I	DRMRIJ-31	30	75	1925	1385	39.0

S.No.	Districts/KVKs	Variety (s)	Area (ha)	CFLDs (No.)	Yield (kg/ha)		Percent increase
					CFLDs	FPs	
26.	Jalore-II	DRMR1165-41	30	75	1725	1339	28.8
27.	Jhalawar	DRMR 1165-40	40	100	1562	1173	33.2
28.	Jhunjhunu	PM-30	40	80	1642	1501	9.4
29.	Jodhpur-I	RH-725	40	100	2118	1809	17.1
30.	Jodhpur-II	RH-749	40	105	2085	1563	33.4
31.	Karauli	RH-725	20	50	2490	2180	14.2
32.	Kota	DRMR 2017-15	40	80	1693	1459	16.0
33.	Nagaur-I	RH-725	40	100	2011	1624	23.8
34.	Nagaur-II	DRMR 1165-40	20	50	1510	1305	15.7
35.	Pali-I	RH 725	20	40	2051	1250	64.1
36.	Pali-II	DRMR-1165-40	20	50	2235	1841	21.4
37.	Pratapgarh	RH-761	30	75	1880	1560	20.5
38.	Rajsamand	RH 725	10	25	1630	1320	23.5
39.	Sawai Madhopur	RH-725	40	50	1879	1554	20.9
40.	Sikar-I	RH 725	30	75	1861	1625	14.5
41.	Sikar-II	RH -725	20	40	1786	1350	32.3
42.	Sirohi	RH-725	20	50	1500	1291	16.2
43.	Sri Ganganagar	RH-725	40	100	1970	1534	28.4
44.	Tonk	DRMR 1165-40	30	60	2080	1740	19.5
45.	Udaipur-I	DRMR 1165-40	20	25	1555	1030	51.0
46.	Udaipur-II	DRMR 1165-40	30	75	1530	1350	13.3
Total			**1360**	**3106**			

'PM-32' Mustard under CFLDs in Bundi (Rajasthan)

Haryana: The highest seed yield of 2270 kg/ha was observed under Gurugram conditions in CFLDs of 'DRMR 2017-15' mustard. The average yield of 1841 kg/ha was recorded in CFLDs against 1609 kg/ha in FPs registering an increase of 15.8%. The CFLDs resulted in higher net return of Rs. 70005.7/ha as compared to Rs. 57474.2/ha under FPs . On an average, advantage of 232 kg/ha in yield and Rs. 12531.5/ha in net return was achieved with CFLDs over FPs (Table 7.12).

Table 7.12 Mustard under CFLDs in Haryana and Delhi during 2023-24

S.No.	KVKs	Variety (s)	Area (ha)	CFLDs (numbers)	Yield CFLDs (kg/ha)	Yield FPs (kg/ha)	Percent increase
1	Bhiwani	RH-725	80	200	1934	1762	9.8
2	Faridabad	RH -725	50	125	1680	1490	12.8
3	Fatehabad	RH-725	50	85	1960	1704	15.0
4	Gurugram	DRMR 2017-15	45.12	111	2270	2140	6.1
5	Hisar	RH-725	44.53	110	1820	1700	7.1
6	Jhajjar	RH 725	50	125	1950	1800	8.3
7	Jind	RH-725	50	125	1671	1450	15.2
8	Kaithal	RH-725	40	100	1828	1740	5.1
9	Karnal	DRMR 2017-15	50	125	1826	1525	19.7
10	Kurukshetra	RH-725	50	125	1095	750	46.0
11	Mahendergarh	RH-725	30	75	2030	1705	19.1
12	Panipat	RH-725	50	125	2020	1660	21.7
13	Rewari	RH-725	50	125	2097	1781	17.7
14	Rohtak	RH 725	30	75	1460	1200	21.7
15	Sirsa	RH725	50	125	2100	1900	10.5
16	Sonipat	RH 725	49.6	124	1709	1480	15.5
17	Yamunanagar	PM-25 and PM-28	60	150	1845	1570	17.5
Total			**889.25**	**2180**			
Delhi		RH 725	50	125	1950	1600	21.9

'RH-725' mustard under CFLDs in Mahendergarh (Haryana)

Delhi: The CFLDs on 'RH-725' mustard resulted an average yield of 1950 kg/ha as compared to the 1600 kg/ha under FPs registering an increase of 21.9% (Table 7.12). The CFLDs fetched higher net return (Rs. 73034/ha) than FPs (Rs. 57200/ha). The yield advantage of 350 kg/ha was achieved by CFLDs adding to farmers' income by Rs. 15834/ha.

Field Day at 'RH-725' mustard fields in S-W Delhi

Oilseed (other than NFSM)

Total 469 FLDs on 198 ha was conducted on oilseeds through KVK scheme in Rajasthan, Haryana and Delhi. The details are given in Table 7.13.

Table7.13 Performance of FLDs on Oilseed Crops in Rajasthan, Haryana and Delhi

Crops (KVKs)	Theme	No. of farmers	Area (ha)	Weighted Mean			BCR	
				Demo yield (kg/ha)	Local check (kg/ha)	Increase in yield (%)	Demo	Check
Rajasthan								
Groundnut (1)	IPM	10	4.00	1532	1267	20.9	1:1.73	1:1.47
Soybean (3)	ICM	152	60.00	1542	1272	21.3	1:2.60	1:2.25
Mustard (6)	ICM	258	114.50	1944	1638	18.4	1:2.77	1:2.30
Haryana and Delhi								
Groundnut (1)	ICM	30	12.00	2140	1790	19.6	1:2.37	1:2.13
Sunflower (1)	ICM	19	8.00	2353	2015	16.8	1:4.76	1:4.29

Cereal crops

FLDs on cereal crops were conducted at 5368 farmers' fields in an area of 2190.5 ha in 2023-24 (Table 7.14). Rice, Maize, Wheat and Barley were the major crops on which FLDs were undertaken in Rajasthan, Haryana and Delhi. Detailed information about FLDs on cereal crops are depicted in table

Maize: 7 KVKs of Rajasthan (Banswara, Baran, Dungarpur, Pratapgarh, Rajsamand, Udaipur – I and Udaipur-II) conducted FLDs on 605 farmers' fields covering an area of 181.0 ha. Farmers' FLDs resulted 28.4% higher grain yield of maize in Kharif season and 20.2% more yield in Rabi maize crops with ICM package over the farmer's practice.

Rice: 11 KVKs of Haryana (Ambala, Fatehabad, Jhajjar, Jind, Kaithal, Kurukshetra, Panipat, Rohtak, Sirsa, Sonipat and Yamunanagar) conducted FLDs on rice on 620 farmers' fields over an area of 244.6 ha during 2023-24. The FLDs resulted into 5% and 13.8% higher yields over farmers practice under RCT and ICM practices, respectively.

Table 7.14 Performance of FLDs on Cereal Crops in Rajasthan

Crops (KVKs)	Theme	No. of farmers	Area (ha)	Weighted Mean		
				Demo yield (kg/ha)	Local check (kg/ha)	Increase in yield (%)
Rajasthan						
Kharif Maize (7)	ICM	295	79.0	2970	2417	28.4
Rabi Maize	ICM	310	102.0	6097	5007	20.2
Barley (9)	ICM	262	108.6	4267	3627	17.7
Wheat (24)	ICM	908	374.7	4820	4194	15.5
	Natural farming	28	11.2	3150	3940	-19.6
Haryana and Delhi						
Paddy (11)	ICM	209	99.0	4884	4300	13.8
	RCT	411	145.6	5048	4810	5.0
Barley (3)	Varietal Evaluation	41	16.4	3916	3417	15.0
Wheat (15)	CRM	1987	930.0	5120	4845	5.8
	ICM	857	300.0	4650	4231	10.2
	INM	20	8.0	5735	5175	10.8
	Natural farming	40	16.0	4036	4758	-15.1
	Total	5368	2190.5			

Wheat: 24 KVKs of Rajasthan (Alwar-1, Bharatpur, Dausa, Dholpur, Dungarpur, Hanumangarh II, Hanumangarh-I, Jaipur-I, Jaipur-II, Jaisalmer-I, Jhalawar, Jhunjhunu, Karauli, Kota, Nagaur-II, Pali-I, Pratapgarh, Rajsamand, Sawai Madhopur, Sikar-I, Sikar-II, Sirohi, Sriganganagar, and Udaipur-II) conducted FLDs under varying packages on wheat along with farmers practices. The ICM practices yielded 15.5% higher yield over local practices existing with the farmers while FLDs on natura farming in wheat yielded 19.6 % less yield than the farmers practice of growing wheat with the application of recommended doses of chemical fertilizers. In Haryana, 14 KVKs (Bhiwani, Ambala, Faridabad , Fatehabad, Gurugram, Jhajjar, Jind, Kaithal , Kurukshetra, Mahendergarh , Panipat, Rohtak, Sirsa, Sonipat and Yamuna Nagar) conducted FLDs on wheat at 2904 farmer's field covering an area of 1254 ha. The ICM and INM resulted into higher positive yield advantage than CRM practices RCT while natural farming yielded 15.1% less yield than chemical fertilizer usage in wheat.

Barley: 9 KVKs of Rajasthan (Alwar-1, Bharatpur, Churu-I, Jaipur-I, Jaipur-II, Pali-I, Rajsamand, Sawai Madhopur and Sikar-I) conducted FLDs at 262 farmers' fields on 108.6 ha with 17.7 % yield increase over farmers practice. In Haryana, 3 KVKs (Bhiwani, Hisar and Rewari) conducted FLDs on barley at 41 farmers' fields on 16.4 ha during 2023-24. Yield advantage of 15.0 % was recorded in FLDs over farmers practice.

Millets

Total 911 demonstrations were conducted on pearl millet, sorghum, and barnyard millet in Rajasthan and Haryana on 522 ha area during 2023-24 (table 7.16). In Rajasthan, FLDs on pearl millet, sorghum were conducted at 763 farmers' fields on 464.8 ha area. The details are given in table 7.15.

Table 7.15 Performance of Millets under FLDs in Rajasthan and Haryana during 2023-24

Crops (KVKs)	Theme	No. of farmers	Area (ha)	Weighted Mean			BCR	
				Demo yield (kg/ha)	Local check (kg/ha)	Increase in yield (%)	Demo	Check
Rajasthan								
Pearl millet (17)	ICM	731	453.8	1268	1063	17.4	1:2.1	1:1.8
Sorghum (3)	ICM	32	11.0	2137	1748	20.7	1:2.0	1:1.7
Haryana								
Barnyard millet (1)	ICM	10	2.0	450	330	36.4	1:3.8	1:3.1
Pearl millet (6)	ICM	138	55.2	3110	2780	13.2	1:2.5	1:2.3
	Total	**911**	**522.0**					

Pearl Millet: Demonstrations were undertaken by 17 KVKs (Ajmer, Alwar-II, Barmer-I, Barmer-II, Bharatpur, Churu II, Dausa, Hanumangarh II, Jaipur-I, Jaisalmer-I, Jaisalmer-II, Jalor-I, Jhunjhunu, Jodhpur-1, Jodhpur-II, Nagaur-I and Nagaur-II) of Rajasthan at 731 farmers' fields on 453.77 ha and 6 KVKs (Bhiwani, Hisar, Jhajjar, Kaithal, Rewari and Rohtak) of Haryana at 138 farmers' fields on 55.2 ha area. The yield advantages were 17.4 % in Rajasthan and 13.2% in Haryana over local check (Table 7.16)

Sorghum: Demonstrations on Sorghum was undertaken by 3 KVKs (Baran, Jaipur-I and Udaipur-II) at 32 farmer's field covering an area of 11 ha. Yield advantage of 20.7% over local check was received by the farmers.

Barnyard millet: Demonstrations were undertaken by KVK Ambala at 10 farmers' fields on 2 ha area. The farmers obtained 450 kg/ha yield under FLDs against 330 kg/ha under local check. The yield advantage was 36.4% in FLDs over farmers practice with every rupee invested giving return of Rs. 3.80 in FLDs and Rs 3.10 in farmers practice.

Cotton

FLDs on cotton were conducted at 149 farmers' fields on 59.6 ha in 2023-24 in Haryana. FLDs on cotton were undertaken by 5 KVKs (Bhiwani, Bhiwani, Hisar, Rohtak and Sirsa). The highest yield of 1518 kg/ha was recorded in ICM demonstration which was 25.4% higher over local check (table 7.16).

Table 7.16 FLDs on commercial crops in Rajasthan and Haryana

Crops (KVKs)	Theme	No. of farmers	Area (ha)	Weighted Mean			BCR	
				Demo yield (kg/ha)	Local check (kg/ha)	Increase in yield (%)	Demo	Check
Cotton (5)	ICM	109	43.6	1518	1217	25.4	1:1.69	1:1.48
	INM	40	16.0	1390	1263	10.1	1:1.63	1:1.48
	Total	**149**	**59.6**					

Cluster bean

Total 640 FLDs on Clusterbean were conducted at as many farmers fields covering 268.6 ha area in 2023-24. In Rajasthan, 546 FLDs at 231.0 ha and in Haryana 94 FLDs on 37.6 ha area were conducted (Table 7.17). Seven KVKs (Churu-I, Jaipur-I, Jalor-I, Jhunjhunu, Nagaur-II, Sikar-I and Udaipur-II) conducted FLDs on Clusterbean. The highest yield of 1493 kg/ha was recorded under ICM which was 16.8% higher over local check. In Haryana, demonstrations were undertaken by 3 KVKs (Bhiwani, Fatehabad and Mahendergarh). The weighted mean yield was recorded 1452 kg/ ha with the B: C ratio of 1:3.30.

Table 7.17 Performance of FLD on Other crops in Rajasthan.

Crops (KVKs)	Theme	No. of farmers	Area (ha)	Yield (Kg/ha)			BCR	
				Demo	Local)	% increase	Demo	Check
Rajasthan								
Clusterbean (7)	ICM	546	231.0	1493	1273	16.8	1:3.06	1:2.76
Haryana								
Clusterbean (3)	ICM	34	13.6	1308	1123	17.2	1:2.35	1:2.16
	IDM	60	24.0	1533	1387	10.6	1:4.01	1:3.73
Total		**640**	**268.6**					

Fodder Crops

FLDs on fodder crops were undertaken by 227 farmers covering 51.50 ha area. In Rajasthan, FLDs were conducted at 127 locations on 24 ha. in berseem, napier grass, oat, and sorghum The details are given in Table 7.18.

Table7.18 Performance of Fodder Crops under FLDs in Rajasthan and Haryana

Crops KVKs)	Theme	No. of farmers	Area (ha)	Yield of green fodder (kg/ha)			BCR	
				Demo	Local	Increase in yield (%)	Demo	Check
Rajasthan								
Berseem (1)	ICM	32	4.00	53200	47200	12.7	1:4.23	1:3.97
Napier grass (2)	ICM	45	14.00	121000	86500	39.8	1:5.85	1:3.06
Oat (1)	ICM	10	2.00	42500	37700	12.7	1:4.40	1:3.91
Sorghum (1)	ICM	40	4.00	38200	34500	10.7	1:3.72	1:3.51
Haryana								
Maize(1)	ICM	10	4.00	45135	42060	7.3	1:3.22	1:2.55
Sorghum (2)	ICM	50	11.00	26091	16545	52.5	1:1.74	1:1.27
Oat(2)	ICM	40	12.50	53320	50444	5.7	1:2.73	1:2.59
Total		**227**	**51.5**					

Rajasthan

Berseem: FLDs at 32 farmers' fields on 4 ha was conducted under Alwar-I siutations. Farmers harvested 7 cuttings of Berseem. The berseem as green fodder mixed with wheat straw improved health of animals and increased milk yield.

Napier grass: Demonstrations were undertaken by 2 KVKs (Jalore-II and Barmer-II) on 45 farmers' fields in an area of 14.0 ha. Napier grass has become popular among farming community.

Oat: Demonstrations were undertaken by KVK Hanumangarh-II on 10 farmers' fields in an area of 2.0 ha. Two cutting of oat could be taken under partial irrigated condition.

Sorghum: Demonstrations were undertaken by KVK Alwar-I on 40 farmers' fields in an area of 4.0 ha. Sorghum has become popular among farming community.

Haryana

Maize: Demonstrations were undertaken by KVK Karnal on 10 farmers' fields in an area of 4.0 ha maize has become popular among farming community.

Sorghum: Demonstrations were undertaken by 2 KVKs (Bhiwani and Rohtak) on 50 farmers' fields in an area of 11.00 ha. Sorghum has become popular among farming community.

Oat: FLDs on oat were undertaken by 2 KVKs (Hisar and Jhajjar) on 40 farmers' fields in an area of 12.50 ha. during Rabi. Farmers fetched good remuneration as well as quality fodder.

Horticultural Crops

FLDs on horticultural crops included fruits, vegetables, flowers, species and medicinal and aromatic plants.

Fruit crops

KVKs of Rajasthan and Haryana conducted FLDs on Papaya, Guwava and Kinnow on 53 farmers fields at 21 ha area during 2023-24 (Table 7.19).

Papaya: FLDs were undertaken by 2 KVKs of Rajasthan (Baran and Pali-I) at 23 locations over an area of 9.0 ha. area on ICM component. An average yield 40843 kg/ha was obtained from orchards under FLDs against 31001 kg/ha in check with yield increase of 36.9%. The farmers received Rs. 0.46 extra at every rupee invested in FLDs than the local check.

Guava: FLDs were undertaken by KVK Sirsa at 10 locations over and area of 4.0 ha on IDM component. An average yield 16200 kg/ha was obtained from orchards with yield advantage of 8% over local check.

Kinnow: FLDs were undertaken by 2 KVKs Hisar and Sirsa at 20 locations over and area of 8.0 ha area on IDM component. An average yield 22200 kg/ha. was obtained from orchards.

Table7.19 Performance of FLDs on Fruit Crops in Rajasthan

Crops (KVKs)	Theme	No. of farmers	Area (ha)	Yield (kg/ha)			BCR	
				Demo	Local	Increase (%)	Demo	Check
Rajasthan								
Papaya (2)	ICM	23	9.0	40843	31001	36.9	1:3.93	1:3.47
Haryana								
Guava(1)	IDM	10	4.0	16200	15000	8.0	1:7.53	1:7.30
Kinnow (2)	IDM	20	8.0	22200	18700	18.9	1:2.01	1:1.70
Total		53	21.0					

Vegetable Crops

In Rajasthan, FLDs on vegetable crops were conducted on 577 farmers' fields in 106.2 ha area (Table 7.20). The FLDs on various vegetables yielded 8.9% in cabbage to 58.0% yield increase in green pea. Both ICM and IPM proved advantageous. The highest B:C ratio of 1:1.75 was recorded in brinjal FLDs followed by onion (1:5.37).

Table 7.20 Performance of Vegetable Crops under FLD on in Rajasthan

Crops (KVKs)	Theme	No. of farmers	Area (ha)	Weighted Mean			BCR	
				Demo yield (kg/ha)	Local check (kg/ha)	Increase in yield (%)	Demo	Check
Bitter gourd (1)	ICM	10	1.0	27379	23783	15.1	1:2.36	1:2.08
Bottle gourd (2)	ICM	27	7.5	26137	21493	21.6	1:5.13	1:3.99
Brinjal (4)	ICM	38	9.5	44123	38526	14.6	1:7.15	1:5.20
Cabbage (1)	ICM	10	2.5	29400	27000	8.9	1:3.86	1:3.49
Cauliflower (2)	ICM	20	3.5	27812	24707	12.1	1:4.31	1:3.90
Chilli (3)	ICM	38	7.0	51186	44171	15.3	1:3.02	1:2.79
Muskmelon (2)	IPM	40	5.5	29009	24309	20.1	1:2.58	1:2.05
Okra (5)	ICM	112	15.8	16717	14217	17.5	1:4.06	1:3.64
Onion (5)	ICM	72	14.5	40986	35375	17.7	1:5.37	1:4.84
Green Pea (1)	IPM	8	1.0	14015	8870	58.0	1:2.95	1:1.99
Ridge gourd (1)	Varietal evaluation	8	1.5	14000	11600	20.7	1:2.62	1:2.16
Snap melon (1)	ICM	10	1.0	16600	14500	14.5	1:3.77	1:3.35
Tomato (11)	ICM	136	24.9	39766	32910	18.1	1:3.96	1:3.43
	IPM	38	7.0	18775	15380	22.0	1:3.81	1:3.59
	Total	174	31.9	35160	29063	19.0	1:3.93	1:3.46
Water melon (1)	ICM	10	4.0	59819	54846	9.1	1:3.41	1:2.72
	Grand Total	**577**	**106.2**					

The lowest B:C ratio of 1:2.36 was noticed in bitter gourd in demons and 1:2.05 in muskmelon under farmers' practices. The vegetable cultivation with improved package of practices can boost the income manifold as evident from these B:C ratio.

In Haryana and Delhi FLDs on vegetable crops were conducted at 207 farmers' fields on 75.1 ha area. The major vegetables on which FLDs were conducted are carrot, cucumber, okra, onion, pea, potato and tomato (Table 7.21). The FLDs on vegetable provided multiple times income over unit investment by the farmers. Every rupee invested in vegetable give Rs.1.28 to Rs.4.58 return to farmers during 2023-24 in cucumber and green pea, respectively. Amongst the various vegetables, tomato and cucumber were in the lowest category of return per rupee invested. Onion and green pea under IDM and IPM, respectively fetched more than Rs.4.4 per rupee invested in FLDs and almost identical under farmers practice. The yield advantage varied from 2.4 to 25.0 % in FLDs over control.

Table 7.21 Performance of Vegetable Crops under FLDs on in Haryana and Delhi

Crops (KVKs)	Theme	No. of farmers	Area (ha)	Weighted Mean			BCR	
				Demo yield (kg/ha)	Local check (kg/ha)	Increase in yield (%)	Demo	Check
Carrot (1)	ICM	10	2.00	34000	29100	16.8	1:3.19	1:2.91
Cucumber (1)	ICM	5	2.00	122500	98000	25.0	1:1.28	1:1.04
Okra (4)	ICM	33	7.30	14177	11456	22.8	1:3.93	1:3.27
Onion (3)	ICM	35	16.20	24169	21134	13.9	1:3.52	1:3.25
	IDM	12	4.80	24210	23640	2.4	1:4.42	1:4.29
	Total	47	21.00	24178	21707	11.3	1:3.70	1:3.46
Pea (1)	IPM	50	20.00	9830	9520	3.3	1:4.58	1:4.43
Potato (2)	ICM	35	14.00	37979	35700	9.4	1:3.58	1:3.76
Tomato (1)	ICM	27	8.80	32336	29675	9.0	1:2.86	1:2.61
	Grand Total	**207**	**75.1**					

Flower

KVKs of Haryana & Delhi conducted FLDs on marigold. FLDs were undertaken by KVK Delhi and Rewari at 10 locations over and area of 2.0 ha area on ICM components. An average yield 20500 kg/ha. was obtained with Rs.3.69 return per rupee invested in marigold cultivation.

Spice Crops

Total 270 FLDs on spice crops were undertaken covering 104.90 ha area in Rajasthan and Haryana. The details about the FLDs are presented in Table 7.22.

In Rajasthan, FLDs on coriander, cumin, fennel, fenugreek, and garlic etc. were conducted on 103.9 has while in Haryana 10 FLDs on 1.0 ha conducted on fenugreek. Amongst various seed spices, the highest yield advangage of improved practices in FLDs of 26.9% recorded under ICM in cumin in rajasthan, while the lowest of 8.9% in fenugreek under ICM in Haryana. Interestingly, in cumin ICM, IDM and Natural farming were demonstrated which yielded 26.9, 18.4 and -25% yield in increase against farmers practices. The ICM practices in funnel, fenugreek and garlic also gave 20.5, 26.0, 17.8 and 18.8% yield increase are farmer practices. Coriander, cumin and fennel gave more than 2.5 per rupee invested in FLDs and almost identical in farmers pracrice.

Table7.22 Performance of FLD on Spice Crops in Rajasthan

Crops (KVKs)	Theme	No. of farmers	Area (ha)	Yield (kg/ha)			BCR	
				Demo yield (kg/ha)	Local check (kg/ha)	Increase in yield (%)	Demo	Check
Rajasthan								
Coriander (1)	ICM	10	5.00	1626	1480	9.9	1:5.54	1:4.88
Cumin (7)	ICM	110	47.00	622	492	26.9	1:5.07	1:4.30
	IDM	10	4.00	328	277	18.4	1:3.98	1:3.53
	Natural Farming	16	6.40	364	485	-25.0	1:4.09	1:4.29
Fennel (1)	ICM	5	2.00	1865	1480	26.0	1:5.83	1:4.89
Fenugreek (3)	ICM	79	33.00	1395	1186	17.8	1:2.73	1:2.51
Garlic (2)	ICM	30	6.50	6185	5459	13.8	1:1.67	1:1.60
Haryana								
Fenugreek (1)	ICM	10	1.00	1590	1460	8.9	1:2.78	1:2.63
Total		**270**	**104.9**					

Medicinal crops

FLDs on isabgol were conducted by 2 KVKs Jalore-I and Nagaur-II. Under Isabgol demonstrations 35 farmers were covered with an area of 14.0 ha. Farmers received 6.92kg/ha yield in ICM practices demonstrated under FLDs.

Farm Implements

Rajasthan: KVKs Churu-I, Jodhpur-I and Tonk and Udaipur-I conducted 220 FLDs on the farm implements viz, three tyne weeder, improved kassi, hand wheel hoe weeder and Groundnut Decorticator, (Table 7.23). The application farm machineries proved advantageous in terms enhancing the efficiency of operations and also the quality.

Table 7.23 Performance of FLD on Farm Implements

Implement	Demonstrated Technology	Crop	Area	Parameters	Observation	
					Demo	Check
Churu-I (20) 25% economy in labor requirement						
Three Tyne Weeder	Weeding implement	Cluster bean	10		104.17	83.33
Jodhpur-I (50) 25% economy in labor requirement						
Improved Kassi	Intercultural	Field crops	-	Mandays/ha	12	15
Tonk (120)						
Groundnut Decortications	Threshing	Groundnut	-	WHR (Beat/min.)	30	2
Hand Wheel Hoe Weeder	Weeding	Groundnut	0.45	Saving in time (%)	150	93
Total (220)			10.45			
Udaipur-I						
Three phase motor operated thresher (5)	Threshing	Wheat	2	Threshing efficiency	90-93 %	88-90
				Grain breakage loss	0.45%	2.4%
				Output in one hour	450-500 kg/hr	700-800 kg/hr
Ambala						
Super Seeder (150)	Crop Residue Management	Rice-wheat	150		54.65	51.62
ZT Drill (20)	RCT	wheat	8	BCR, Labour	0.41	1.41
Twine hand wheel hoe (10)	RCT	Bajra	4	BCR,Labour	2.7	5.2

Haryana: In Haryana, 185 FLDs were undertaken at 164 ha land on the farm implements. The results of the FLDs on the farm implements for resource conservation and weed control revealed substantial reduction in the labour requirement with RCTs and higher B:C ratio with mechanical weeding as compared to manual operations in paddy, wheat and bajra (Table 7.24)

Kitchen Garden

For ensuring nutritional security KVKs of Rajasthan, Haryana and Delhi conducted FLDs on Kitchen Gardening covering 1388 farmers and 168.20 ha.

Livestock

Rajasthan: FLDs involving 1366 units at 568 farmers' households were conducted during 2023-24 (Table 7.24). Health, nutrition, feed management and hygiene in livestock; integrated fish farming through cage culture in fisheries, and backyard poultry, breeding, nutrition and disease management in poultry were major thematic areas on which FLDs were conducted. These FLDs established substantial gain in productivity, profit and breed improvement as well significant reduction in mortality and disease infection in livestock, fisheries and poultry.

Table 7.24 FLDs organized on Livestock by KVKs of Rajasthan

	Technology	Farmer	Units	Parameters	Results	
Bovine						
Bharatpur					Demo	Check
Mitigation of Mineral & vitamin deficiency	Mineral mixture @50gm/day	30	30	8.6 ltr	7.2 ltr	19.44%
Mitigation of Mineral & vitamin deficiency	Urea Molasses Mineral Brix	20	20	8.7 ltr	7.32 ltr	18.85%
Churu-I						
Feeding management	Mineral mixture feed supplement	30	30	8.58	7.84	9.44
Feeding management	Azolla	28	28	8.41	7.6	10.65
Housing management	Cow mat	8	8	8.5	7.6	11.84
Jodhpur-I						
Livestock	Feeding effect of MNFB and its effect on productivity	20	20	Milk production	Salt supplementation	8-10 milk increase
farming						
	Feeding effect of bypass fat	10	10	Milk and fat production	Oil /unsaturated fat feeding	4-5 milk
						1-1.5 fat
	Management of mastitis through teat Deeping	10	10	Incidence of mastitis	Simple udder wash with water	80-85 less disease
	Home-made balance feed and its effect on productivity	12	12	Milk production	Locally available ingredient	08-Oct

	Technology	Farmer	Units	Parameters	Results	
Cattle						
Hanumangarh-I						
Nutrition Management	Use of probiotic in cross breed cattle	10	10	16.26 lit./day/ani.	14.15 lit./day/ani.	14.91
Nutrition Management	Use of chelated mineral mixture in buffalo	10	10	15.23 lit./day/ani.	13.30 lit./day/ani.	14.51
Production and management	Backyard poultry (Kadaknath)	10	30	1207 eggs	919 eggs	31.34
Hanumangarh-II						
Nutritional Management	By-pass fat supplement (2022-23)	10	10	20.67	17.73	16.58
Fish culture						
Hanumangarh-I						
Composite fish culture	Integrated fish farming	10	10	1045		
Poultry						
Hanumangarh-I						
	Backyard poultry (Kadaknath)	50	30	1207 eggs	924 eggs	30.63
Jodhpur-II						
Animal Nutrition Management	Azolla seeds	12	12	5.335	4.7	13.5
Karauli						
Breed Improvement of buck	-	15	15	48	42	12.5
Udaipur-I						
Breed Improvement	Intro of cross colored chicks	53	1060	88 eggs	45 eggs	95.56
Goatary						
Udaipur-I						
Breed Up gradation	Sirohi Breeding Bucks	220	11	0.75 lit	0.55 lit	94.29
Total		**568**	**1366**			

Haryana and Delhi: FLDs on Livestock on 600 units in 262 farmers field (Table 7.25). FLDs on disease and feeding management were organized on bovine and cattle. More than 66 percent farmers accepted performance of demonstrations.

Table 7.25 FLDs organized on Livestock by KVKs of Haryana& Delhi

Category	KVK	Thematic area	Technology demonstrated	Farmer	Units established	Parameters	Results	
							Demo	Check
Cattle	Ambala	Disease Management	Mastitis management in Dairy animals	10	10	Milk yield	Milk : 10.2 lit./day	Milk : 8.7 lit./day
	Ambala	Production & Management	Repeat breeding management in dairy animals	10	10	Milk yield	7 lit./day	4 lit./day
	Bhiwani	Mineral Supplementation	To feed cattle for high milk production	48	48	10.7	10.3	3.9
	Delhi	Use of Herbal Uterine Cleanser	Reproductive management	2	2	Time required for Expulsion of placenta Disappearance of lochial discharge Appearance of first post partum heat	Time required for Expulsion of placenta Disappearance of lochial discharge Appearance of first post partum heat	70% of less prevalence to disease 50% 70%
Buffalo	Delhi	Use of Herbal Uterine Cleanser	Reproductive management	10	10	Time required for Expulsion of placenta Disappearance of lochial discharge Appearance of first post partum heat	Time required for Expulsion of placenta Disappearance of lochial discharge Appearance of first post partum heat	70% of less prevalence to disease 55 75
	Faridabad	Nutritional improvement	Mineral mixture (NICRA)	50	100	Milk production, Lactation period, Fertility status	Milk production, Lactation period, Fertility status	12-15 % increase in milk yield
	Panipat	Feed Mgmt	Effect of balanced feeding on productive parameters of dairy animals	50	50	7.9 kg	7.1 kg	11.26%
		Feed Mgmt	Mineral mixture supplementation and deworming in Cattle	50	50	13.0	11.5	13.04%
Poultry	Ambala	Production & Management	Improved breed of Poultry (Chabrown) Commercial	32	320	Egg production	Egg production 232	Egg production 152
		Total		**262**	**600**			

Women Empowerment

KVKs at Faridabad and Delhi conducted FLDs on nutrition of women famers and females in farmer's households and drudgery reduction of women. The FLDs proved beneficial in terms of productivity, availability of micro-nutrients for better nutrition outcomes. The cotton-picking bags reduced the level of pain in different body parts in the range of 56-92%. (Table 7.26).

Table 7.26 FLDs on nutrition and drudgery reduction

Category	KVK	Technology	No. of demos	Name of observations	Demonstration	Check
Nutritional Security	Delhi	Popularization of biofortified variety of Pearl Millet	10	Nutrient availability	12.5 q/acre Iron (88mg /kg) Zinc (43mg/kg)	10 q/acre Iron (25mg /kg) Zinc (13mg/kg)
Drudgery Reduction	Faridabad	Efficacy of pick bag for drudgery reduction	50	Output per hour	1529	1198

CHAPTER 8

TRAINING ACHIEVEMENTS

KVKs have been providing training for capacity development and skilling of farmers, extension personnel and inputs dealers under DASEI. Total 3921 training courses were organised during 2023 with the participation 114156 trainees (farmers, farm women, rural youth and extension personnel). Total 1730 on-campus trainings (993 in Rajasthan, 715 in Haryana and 22 in Delhi) and 1163 off-campus trainings (1163 in Rajasthan, 1000 in Haryana and 28 in Delhi) were conducted indicating 27% higher training courses off-campus than on-campus. The farmers' participation was 11% higher in off campus trainings as compared to on-campus trainings. The female trainees were more than double in off-campus trainings than on-campus trainings but significantly low than the male farmers. (Table 8.1).

The participation of SC/ST farmers was 35.4% in on-campus trainings and 34.9% in off-campus trainings. The share of these farmers was 44.2 and 44% in on-campus and off-campus trainings, respectively against 31.6 and 24% in Haryana. In Delhi, the share was even lower to 11.3 and 10.7 in on-campus and off-campus trainings respectively. However, the participation of female farmers was the most encouraging with 53.3 and 51.3 % of female farmers in on-campus trainings in Rajasthan and Haryana, respectively. The corresponding figures for off-campus trainings were 51.6 and 42.9 per cent (Figure 8.1). The KVKs has been able to mobilise large number of females in their on-campus and off-campus trainings and thereby helping in mainstreaming of females aligning well with the State and Central Government's policies of social empowerment of women.

Table 8.1 Number of training courses and farmers trained by KVKs of Zone-II

States	On-Campus Trainings									
	No. of courses	Total Farmers (number)			SC/ST Farmers (number)			Share of SC/ST farmers (%) of total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Rajasthan	993	21460	9144	30604	8665	4874	13539	40.4	53.3	44.2
Haryana	715	14332	8467	22799	2859	4345	7204	20.0	51.3	31.6
Delhi	22	359	190	549	46	16	62	12.8	8.4	11.3
Total	1730	36151	17801	53952	11332	7754	19086	31.4	43.6	35.4
Off Campus Training										
Rajasthan	1163	21809	10316	32125	8824	5324	14148	40.5	51.6	44.0
Haryana	1000	19603	7773	27376	3229	3331	6560	16.5	42.9	24.0
Delhi	28	542	161	703	63	12	75	11.6	7.5	10.7
Total	2191	41954	18250	60204	12116	8667	20783	28.9	475	34.5
Grand Total	**3921**	**78105**	**36051**	**114156**	**23448**	**16421**	**39869**	**30.0**	**45.6**	**34.9**

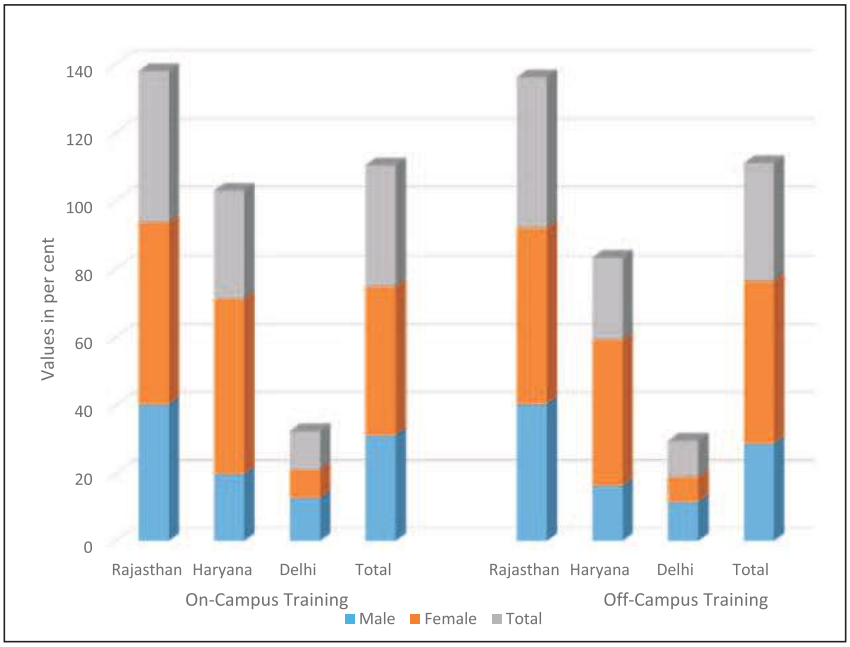


Fig. 8.1 Participation of SC/ST farmers in on-campus and off-campus trainings in 2023

Training of Farmers

Total 3074 training courses were conducted in under different thematic groups which provided training to farmers including male and female farmers (Table 8.2). The number of farmers trained in Rajasthan was 64289 which was more than those trained in Haryana and Delhi.

Table 8.2 Training of farmers and farm women during 2023 by KVKs of Zone-II

Thematic Area	Rajasthan				Haryana and Delhi				Total of Zone-II			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Crop Production	595	13991	3823	17814	355	10262	839	11101	950	24253	4662	28915
Horticulture	334	7321	2062	9383	178	4430	690	5120	512	11751	2752	14503
Soil Health and Fertility Management	113	2482	689	3171	146	3793	165	3958	259	6275	854	7129
Livestock Production	224	5146	1795	6941	65	933	755	1688	289	6079	2550	8629
Home Science	262	981	6335	7316	343	341	9220	9561	605	1322	15555	16877
Agri Engineering	20	548	199	747	114	2832	409	3241	134	3380	608	3988
Plant Protection	300	6343	1645	7988	107	2645	213	2858	407	8988	1858	10846
Fisheries	4	118	0	118	4	92	7	99	8	210	7	217
Production of Inputs	18	392	64	456	22	492	96	588	40	884	160	1044
Capacity Building/ Group Dynamics	89	1768	868	2636	104	2774	449	3223	193	4542	1317	5859
Agroforestry	14	295	64	359	99	1984	921	2905	113	2279	985	3264
Total	**1973**	**39385**	**17544**	**56929**	**1537**	**30578**	**13764**	**44342**	**3510**	**69963**	**31308**	**101271**

Field Crop

Field crop production and systems based activities attracted 950 training courses with the participation of 28915 farmers including 24253 male and 4662 women farmers (Table 8.3). Integrated crop management constituted about 31.4% of the total participants followed by training on resource conservation technologies (8.8%). The farmers have been benefited with ICM and RCT which are very relevant for arid, semi-arid and irrigated ecosystems in the three States of Zone-II.

Table 8.3 Training organised on field crops during 2022 by KVKs of Zone-II

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Crop Production												
Weed Management	62	1528	345	1873	20	502	37	539	82	2030	382	2412
RCTs	33	888	199	1087	53	1382	66	1448	86	2270	265	2535
Cropping Systems	35	856	201	1057	17	506	22	528	52	1362	223	1585
Crop Diversification	23	546	186	732	35	1050	131	1181	58	1596	317	1913
Integrated Farming	31	685	222	907	13	385	43	428	44	1070	265	1335
Micro Irrigation	19	405	83	488	4	92	12	104	23	497	95	592
Seed production	34	665	193	858	14	342	72	414	48	1007	265	1272
Nursery management	0	0	0	0	14	311	81	392	14	311	81	392
Integrated Crop Management	223	5325	1408	6733	74	2235	110	2345	297	7560	1518	9078
Soil & water conservation	14	387	90	477	22	716	63	779	36	1103	153	1256
Integrated nutrient management	37	765	184	949	20	491	19	510	57	1256	203	1459
Production of organic inputs	30	744	178	922	17	721	37	758	47	1465	215	1680
Others	54	1197	534	1731	52	1529	146	1675	106	2726	680	3406
Total	**595**	**13991**	**3823**	**17814**	**355**	**10262**	**839**	**11101**	**950**	**24253**	**4662**	**28915**

Plant Protection

Total 407 training course were organised on plant protection with the participation of 10846 farmers including 1858 women farmers and 8988 male farmers. The male, female and total participants in Rajasthan were 6343, 1645 and 7988, and 2645, 213 and 2858 in Haryana & Delhi respetively (Table 8.5).

Table 8.5 Number of training courses and participants in trainings organised on plant protection measures during 2023 by KVKs of Zone-II

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Plant Protection												
Integrated Pest Management	162	3441	853	4294	54	1328	75	1403	216	4769	928	5697
Integrated Disease Management	76	1454	417	1871	31	778	42	820	107	2232	459	2691
Bio-control of pests and diseases	28	628	166	794	4	171	13	184	32	799	179	978
Production of bio control agents and bio pesticides	12	270	69	339	0	0	0	0	12	270	69	339
Others (pl specify)	22	550	140	690	18	368	83	451	40	918	223	1141
Total	**300**	**6343**	**1645**	**7988**	**107**	**2645**	**213**	**2858**	**407**	**8988**	**1858**	**10846**

Horticultural Crops

Arid horticulture, seed spices and medicinal plants are the strategic crops of Rajasthan. While traditional varieties of roses of Puskar region are world famous the state has also pioneered in hi-tech protected horticulture and off-season vegetable production. Total training courses were conducted on different aspects of horticultural crops dominated by vegetable followed by ornamental plants and seed spices. Total 13064 farmers including farm women were trained on different horticultural crops (Table 8.6).

Table 8.6 Training on horticultural crops during 2022 by KVKs of Zone-II

Horticultural Crops Group	Rajasthan				Haryana and Delhi				Total Zone-II			
	Course	Male	Female	Total	Course	Male	Female	Total	Course	Male	Female	Total
Vegetables	180	3747	1227	4974	113	2816	443	3259	293	6563	1670	8233
Fruits	128	3009	686	3695	52	1372	228	1600	180	4381	914	5295
Ornamental crops	6	136	24	160	5	113	10	123	11	249	34	283
Plantation Crops	1	25	5	30	1	20	0	20	2	45	5	50
Tuber Crops	0	0	0	0	4	59	9	68	4	59	9	68
Spices including Seed Spices	18	379	111	490	3	50	0	50	21	429	111	540
Medicinal & Aromatic	1	25	9	34	0	0	0	0	1	25	9	34
Total	**334**	**7321**	**2062**	**9383**	**178**	**4430**	**690**	**5120**	**512**	**11751**	**2752**	**14503**

Fruit Crops

Trainings to 5295 farmers were provided in 180 training courses during 2023. The participants included 4381 male and 914 female farmers (Table 8.7).

Table 8.7 Training on fruit crops during 2022 by KVKs of Zone-II

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Fruits												
Training and Pruning	15	278	82	360	3	69	12	81	18	347	94	441
Layout and Management of Orchards	39	899	171	1070	14	373	41	414	53	1272	212	1484
Cultivation of Fruit	31	703	190	893	8	252	37	289	39	955	227	1182
Management of young plants/orchards	15	363	136	499	7	181	12	193	22	544	148	692
Rejuvenation of old orchards	1	30	0	30	2	36	12	48	3	66	12	78
Export potential fruits	1	28	2	30	2	53	13	66	3	81	15	96
Micro irrigation systems of orchards	10	192	37	229	4	115	21	136	14	307	58	365
Plant propagation techniques	6	199	19	218	7	183	30	213	13	382	49	431
Others	10	317	49	366	5	110	50	160	15	427	99	526
Total	**128**	**3009**	**686**	**3695**	**52**	**1372**	**228**	**1600**	**180**	**4381**	**914**	**5295**

Vegetable Crops

In vegetable crops, 293 training courses were conducted by KVKs in 2023 with total participation of 8233 farmers. The higher number of courses organized a production of low value & high-volume crops which accounted about 32.21% of the total numbers of trainees (Table 8.8).

Table 8.8 Training on vegetable crops during 2023 by KVKs of Zone-II

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Vegetable Crops												
Production of low value and high volume crops	57	1264	340	1604	40	948	100	1048	97	2212	440	2652
Off-season vegetables	36	771	156	927	7	180	33	213	43	951	189	1140

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Nursery raising	37	736	326	1062	13	338	29	367	50	1074	355	1429
Exotic vegetables	1	0	30	30	5	121	34	155	6	121	64	185
Export potential vegetables	4	74	18	92	2	50	18	68	6	124	36	160
Grading and standardization	4	68	17	85	5	140	25	165	9	208	42	250
Protective cultivation	20	416	163	579	15	494	66	560	35	910	229	1139
Others	21	418	177	595	26	545	138	683	47	963	315	1278
Total	**180**	**3747**	**1227**	**4974**	**113**	**2816**	**443**	**3259**	**293**	**6563**	**1670**	**8233**

Soil & Water Management

Total 259 training courses on Soil and Water Management were conducted in Zone-II with 7129 trainees' farmers and farm women. INM attracted higher participation of 24.6% followed by Soil and Water testing (18.5 2%). The female farmers participation was dismally low in Haryana (only 4.1% of the total of State) against 26.5% in Rajasthan (Table 8.9).

Table 8.9 Training on Soil and Water Management during 2023 by KVKs

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Soil and Water Management												
Soil fertility management	13	244	70	314	13	357	11	368	26	601	81	682
Integrated water management	5	125	15	140	5	295	3	298	10	420	18	438
Integrated Nutrient Management	31	707	138	845	41	862	45	907	72	1569	183	1752
Production and use of organic inputs	23	488	181	669	6	146	9	155	29	634	190	824
Management of Problematic soils	3	80	7	87	4	163	3	166	7	243	10	253
Micro nutrient deficiency in crops	4	71	36	107	6	169	0	169	10	240	36	276
Nutrient Use Efficiency	6	132	23	155	13	286	0	286	19	418	23	441
Balance use of fertilizers	4	109	22	131	18	513	5	518	22	622	27	649
Soil and Water Testing	20	422	144	566	27	684	72	756	47	1106	216	1322
Others	4	104	53	157	13	318	17	335	17	422	70	492
Total	**113**	**2482**	**689**	**3171**	**146**	**3793**	**165**	**3958**	**259**	**6275**	**854**	**7129**

Training on production of Inputs

Total 40 courses were organized during 2023 for capacity development of farmers on input production at site. Mushroom production and vermi-compost/ biofertilizer were preferred courses by the farmers (Table 8.10).

Table 8.10 Training on Production of Inputs during 2023 by KVKs of Zone-II

Thematic area	Rajasthan				Har+Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Production of Inputs at site												
Seed Production	0	0	0	0	4	122	11	133	4	122	11	133
Planting material production	1	24	0	24	0	0	0	0	1	24	0	24
Bio-agent production	0	0	0	0	2	24	13	37	2	24	13	37
Vermi-compost production	7	162	16	178	2	45	6	51	9	207	22	229
Production of fry & fingerlings	0	0	0	0	1	16	0	16	1	16	0	16
Production of bee colonies	0	0	0	0	5	96	28	124	5	96	28	124
Mushroom Production	6	102	36	138	3	84	18	102	9	186	54	240
Apiculture	3	88	3	91	3	76	13	89	6	164	16	180
Others	1	16	9	25	2	29	7	36	3	45	16	61
Total	**18**	**392**	**64**	**456**	**22**	**492**	**96**	**588**	**40**	**884**	**160**	**1044**

Agricultural Engineering

Total 3988 farmers (3380 male and 608 female) were trained in 134 training courses in Agricultural Engineering (Table 8.11). Repair and Maintenance of farm implements and micro-irrigation were preferred training courses including others (Table 8.11).

Table 8.11 Training on Agril. Engineering during 2023 by KVKs of Zone-II

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Agril. Engineering												
Farm Machinery and its maintenance	3	56	13	69	27	653	65	718	30	709	78	787
Micro irrigation systems	2	45	3	48	23	549	77	626	25	594	80	674
Use of Plastics in Agriculture	1	13	7	20	10	211	45	256	11	224	52	276
Production of small tools and implements	0	0	0	0	2	70	0	70	2	70	0	70

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Repair and maintenance of farm machinery/ implements	3	52	16	68	28	647	39	686	31	699	55	754
Small scale processing and value addition	0	0	0	0	7	205	47	252	7	205	47	252
Post-Harvest Technology	4	77	7	84	4	123	107	230	8	200	114	314
Others	7	305	153	458	13	374	29	403	20	679	182	861
Total	**20**	**548**	**199**	**747**	**114**	**2832**	**409**	**3241**	**134**	**3380**	**608**	**3988**

Livestock Production and Management

Total 289 training courses were conducted on Livestock Management with 8629 farmers and farm women participants (Table 8.12). Dairy management, diseases management, nutrition, poultry and feed & fodder management were the most preferred training courses.

Table 8.12 Training on Livestock Production and Management during 2023 in Zone-II

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Livestock Production and Management												
Dairy Management	60	1487	422	1909	30	498	140	638	90	1985	562	2547
Poultry Management	39	858	252	1110	2	16	22	38	41	874	274	1148
Piggery Management	3	126	12	138	0	0	0	0	3	126	12	138
Rabbit Management	1	32	0	32	0	0	0	0	1	32	0	32
Animal Nutrition Management	22	428	190	618	5	26	175	201	27	454	365	819
Disease Management	37	739	217	956	6	65	82	147	43	804	299	1103
Feed & fodder technology	27	625	313	938	7	140	58	198	34	765	371	1136
Production of quality animal products	8	123	80	203	4	35	77	112	12	158	157	315
Others	27	728	309	1037	11	153	201	354	38	881	510	1391
Total	**224**	**5146**	**1795**	**6941**	**65**	**933**	**755**	**1688**	**289**	**6079**	**2550**	**8629**

Home Science/Women empowerment

Total 605 trainings courses were organized on Home Science & Women Empowerment which provided training to 16877 farmers including farm women. The women farmers participation was 86.59% in Rajasthan and 96.43% in Haryana & Delhi (Table 8.13).

Table 8.13 Training on home science & women empowerment during 2023

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Home Science/Women empowerment												
Household food security - kitchen and nutrition gardening	81	287	2144	2431	33	18	863	881	114	305	3007	3312
Design and development of low/minimum cost diet	9	5	204	209	13	0	401	401	22	5	605	610
Designing and development for high nutrient diets	10	48	237	285	19	0	422	422	29	48	659	707
Minimization of nutrient loss in processing	10	3	230	233	12	0	389	389	22	3	619	622
Processing and cooking	13	68	319	387	21	59	442	501	34	127	761	888
Gender mainstreaming through SHGs	8	3	217	220	23	34	477	511	31	37	694	731
Storage loss minimization techniques	16	56	372	428	3	45	84	129	19	101	456	557
Value addition	74	396	1615	2011	65	8	1661	1669	139	404	3276	3680
Women empowerment	11	7	276	283	10	0	277	277	21	7	553	560
Location specific drudgery reduction technologies	13	32	325	357	17	0	438	438	30	32	763	795
Rural crafts	2	17	17	34	32	0	1188	1188	34	17	1205	1222
Women and child care	9	3	230	233	6	0	175	175	15	3	405	408
Others	6	56	149	205	89	177	2403	2580	95	233	2552	2785
Total	**262**	**981**	**6335**	**7316**	**343**	**341**	**9220**	**9561**	**605**	**1322**	**15555**	**16877**

Capacity Building and Group Dynamics

Total 193 training courses were organized for capacity building and group activities of farmers and farm women providing opportunity to 5859 farmers (2636 in Rajasthan and 3223 in Haryana and Delhi). Leadership development, group formation, entrepreneurship development was the predominant area of trainings (Table 8.14). Interestingly, KVKs have also provided training on trade and IPR issues which could help export promotion and protection of farmers rights.

Table 8.14 Training organised on Capacity building and Group formation activities during 2023 by KVKs of Zone-II

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Capacity Building and Group Dynamics												
Leadership development	14	289	112	401	22	802	25	827	36	1091	137	1228
Group dynamics	8	190	26	216	4	89	10	99	12	279	36	315

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Formation and Management of SHGs	20	257	275	532	5	90	71	161	25	347	346	693
Mobilization of social capital	2	70	17	87	11	165	143	308	13	235	160	395
Entrepreneurial development	23	441	204	645	25	710	80	790	48	1151	284	1435
WTO and IPR issues	1	42	0	42	1	26	0	26	2	68	0	68
Others	21	479	234	713	36	892	120	1012	57	1371	354	1725
Total	**89**	**1768**	**868**	**2636**	**104**	**2774**	**449**	**3223**	**193**	**4542**	**1317**	**5859**

Agroforestry

Total 113 training courses were organized on agroforestry aspects to 3264 farmers (359 in Rajasthan and 2905 in Haryana and Delhi). Production technologies, nursery management of forestry saplings, integrated farming systems, etc were the preferred area of trainings (Table 8.15).

Table 8.15 Training organised on agroforestry during 2022 by KVKs of Zone-II

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Agro-forestry												
Production technologies	0	0	0	0	23	686	112	798	23	686	112	798
Nursery management	0	0	0	0	9	233	8	241	9	233	8	241
Integrated Farming Systems	0	0	0	0	66	1040	801	1841	66	1040	801	1841
Others	14	295	64	359	1	25	0	25	15	320	64	384
Total	**14**	**295**	**64**	**359**	**99**	**1984**	**921**	**2905**	**113**	**2279**	**985**	**3264**

Vocational Training Programmes

ICAR-ATARI Zone-II, Jodhpur facilitated and coordinated the KVKs of Rajasthan, Haryana and Delhi to provide vocational training to rural male and female youths. During 2023, total 188 vocational courses of different durations were organised in which 3721 male and 2222 female youth of rural areas were provided training on crop production, post-harvest technologies, livestock and fisheries, income augmenting activities and agricultural extension (Table 8.16). The ratio of male and female participation in vocational trainings was 4.66:1 in Rajasthan, 0.77:1 in Haryana and 2.70:1 in Delhi. It implied that female youths in Haryana have been participating almost in the same ratio as male (50:50) while it was moderately tilted in favour of males in Rajasthan and highly dominated by males Delhi. The KVKs in Delhi and Rajasthan shall have to work aggressively to enhance the female participation in vocational trainings.

Table 8.16 Vocational Training organised during 2023 by KVKs of Zone-II

Area of training	Rajasthan			
	Courses	Male	Female	Total
Crop production and management	9	359	19	378
Post harvest technology and value addition	7	125	105	230
Livestock and fisheries	26	928	104	1032
Income generation activities	30	566	251	817
Agricultural Extension	13	421	22	443
Total of Rajasthan	**85**	**2399**	**501**	**2900**
	Haryana			
Crop production and management	10	315	38	353
Post harvest technology and value addition	15	46	389	435
Livestock and fisheries	9	121	148	269
Income generation activities	59	684	1036	1720
Agricultural Extension	3	29	64	93
Total of Haryana	**96**	**1195**	**1675**	**2870**
	Delhi			
Crop production and management	1	15	4	19
Post harvest technology and value addition	1	13	11	24
Livestock and fisheries	2	49	8	57
Income generation activities	3	50	23	73
Agricultural Extension	0	0	0	0
Total of Delhi	**7**	**127**	**46**	**173**
	Total of Zone-II			
Crop production and management	20	689	61	750
Post harvest technology and value addition	23	184	505	689
Livestock and fisheries	37	1098	260	1358
Income generation activities	92	1300	1310	2610
Agricultural Extension	16	450	86	536
Total of Zone-II	**188**	**3721**	**2222**	**5943**

Rural Youth

KVKs of Zone-II organised 262 courses involving 7404 rural youths (4177 male and 3227 female) during 2023. While Rajasthan KVKs organised 112 courses the KVKs of Haryana and Delhi organised 150 courses with 2084 and 2095 participants, respectively (Table 8.17). Beekeeping, value addition Tailoring and stitching and mushroom production attracted the higher participation of rural youths in the training organised by the KVKs.

Table 8.17 Training of rural youth during 2023 by KVKs of Zone-II

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Rural Youth												
Nursery Management of Horticulture crops	13	360	83	443	12	284	49	333	25	644	132	776
Training and pruning of orchards	4	82	14	96	2	49	16	65	6	131	30	161
Protected cultivation of vegetable crops	5	110	17	127	5	166	15	181	10	276	32	308
Commercial fruit production	0	0	0	0	2	52	14	66	2	52	14	66
Integrated farming	2	67	0	67	3	71	16	87	5	138	16	154
Seed production	1	30	10	40	2	55	14	69	3	85	24	109
Production of organic inputs	5	120	9	129	2	51	15	66	7	171	24	195
Planting material production	1	24	0	24	3	72	1	73	4	96	1	97
Vermiculture	6	125	22	147	2	46	6	52	8	171	28	199
Mushroom Production	6	131	37	168	10	212	61	273	16	343	98	441
Bee-keeping	6	249	3	252	10	288	42	330	16	537	45	582
Sericulture	0	0	0	0	10	48	10	58	10	48	10	58
R&M of farm machinery and implements	1	8	12	20	1	15	0	15	2	23	12	35
Value addition	13	69	247	316	20	52	497	549	33	121	744	865
Small scale processing	0	0	0	0	2	0	70	70	2	0	70	70
Post-harvest Technology	4	41	80	121	5	90	81	171	9	131	161	292
Tailoring and Stitching	4	0	116	116	27	0	748	748	31	0	864	864
Rural Crafts	1	0	30	30	0	0	0	0	1	0	30	30
Production of quality animal products	1	0	30	30	0	0	0	0	1	0	30	30
Dairying	8	110	96	206	18	145	264	409	26	255	360	615
Sheep and goat rearing	6	119	23	142	3	42	10	52	9	161	33	194
Piggery	0	0	0	0	2	36	0	36	2	36	0	36
Poultry production	1	16	2	18	1	0	12	12	2	16	14	30
Fish harvest and processing technology	3	67	0	67	0	0	0	0	3	67	0	67
Others	21	365	301	666	18	358	164	522	39	723	465	1188
Total	**112**	**2093**	**1132**	**3225**	**150**	**2084**	**2095**	**4179**	**262**	**4177**	**3227**	**7404**

Extension Personnel

Total 71 training courses were organised by KVKs involving 5481 extension personnel of Rajasthan, Haryana and Delhi during 2023. It comprised of 2575 extension personnel of Rajasthan, 2906 of Haryana & Delhi (Table 8.18).

Table 8.18 Training of extension personnel during 2023 by KVKs of Zone-II

Thematic area	Rajasthan				Haryana and Delhi				Total of Zone			
	Courses	Male	Female	Total	Courses	Male	Female	Total	Courses	Male	Female	Total
Extension Personnel												
Productivity enhancement in field crops	14	304	121	425	27	941	136	1077	41	1245	257	1502
Integrated Pest Management	9	190	36	226	20	740	100	840	29	930	136	1066
Integrated Nutrient management	7	325	51	376	5	133	19	152	12	458	70	528
Rejuvenation of old orchards	1	25	8	33	0	0	0	0	1	25	8	33
Protected cultivation technology	3	84	26	110	0	0	0	0	3	84	26	110
Production and use of organic inputs	7	264	66	330	0	0	0	0	7	264	66	330
Formation and Management of SHGs	3	40	62	102	1	2	28	30	4	42	90	132
Women and Child care	1	0	28	28	3	0	90	90	4	0	118	118
Low cost and nutrient efficient diet designing	6	116	154	270	2	0	55	55	8	116	209	325
Group Dynamics and farmers organization	2	45	5	50	1	33	1	34	3	78	6	84
Capacity building for ICT application	3	60	15	75	1	13	10	23	4	73	25	98
Household food security	4	38	98	136	3	0	110	110	7	38	208	246
Others	11	300	114	414	15	312	183	495	26	612	297	909
Total	**71**	**1791**	**784**	**2575**	**78**	**2174**	**732**	**2906**	**149**	**3965**	**1516**	**5481**

CHAPTER 9

EXTENSION ACTIVITIES

The extension activities such as advisory services, field visits, field days, focussed group discussions, organization of kisan mela, exhibitions, technology shows, IEC campaigns for crop residue management, method demonstrations, etc were conducted during 2023-24. During 2023, 12561 advisory services, 1498 diagnostic visits, 442 field day, 683 group discussions, 669 kisan ghosthi, 1010 film shows, 158 self -help groups, 101 kisan mela, 298 exhibitions, 4605 scientists' visit to farmers field, 56 plant/animal health camps, 159 farmers' seminar/workshop, 601method demonstrations, 512 important days celebrations, 322 special day celebration, 439 exposure visits etc were conducted with the participation of 3389715 farmers and 28567 extension personnel, input dealers, local traders, Hon'ble MP, MLAs and other public leaders- (Table 9.1 and 9.2). Further, 204739 other extension activities viz. electronic media, newspaper coverage, radio talks, television talks, popular articles, animal health camps (number of animals treated), lecture delivered as a resource person, extension literature, technical bulletin and technical reports were also performed by KVKs.

Table 9.1 Extension Activities at a Glance: Zone II during 2023

Activities	Rajasthan	Haryana	Delhi
Extension activities			
No. of programmes	18510	9118	733
No. of farmers	2786047	549893	53775
No. of extension personnel	17306	10511	750
Total beneficiaries	**2803353**	**560404**	**54525**
Other extension activities	193519	10619	601

Table 9.2 Details of extension activities of Zone-II during 2023

Activities	Programmes organised (No)	Participation (Number)		
		Farmers	Extension Personnel	Total
Advisory Services	12561	2041546	2744	2044290
Diagnostic visits	1498	16417	885	17302
Field Day	442	18461	826	19287
Group discussions	683	16565	1053	17618
Kisan Ghosthi	669	38792	1413	40205
Film Show	1010	50586	926	51512
Self -help groups	158	3097	99	3196
Kisan Mela	101	78164	1557	79721

Activities	Programmes organised (No)	Participation (Number)		
		Farmers	Extension Personnel	Total
Exhibition	298	415811	4031	419842
Scientists' visit to farmers field	4605	51565	2288	53853
Plant/animal health camps	56	2795	98	2893
Farm Science Club	26	1174	23	1197
Ex-trainees Sammelan	50	2092	93	2185
Farmers' seminar/workshop	159	7953	302	8255
Method Demonstrations	601	20601	797	21398
Celebration of important days	512	30538	1143	31681
Special day celebration	322	20688	766	21454
Exposure visits	439	19576	565	20141
Others	4171	553294	8958	562252
Total	**28361**	**3389715**	**28567**	**3418282**

9.1 Rajasthan

All 47 KVKs of Rajasthan organized various extension activities such as advisory services, field visits, field days, focussed group discussions, organization of kisan mela, exhibitions, technology shows, IEC campaigns for crop residue management, method demonstrations, etc with the participation of 2786047 farmers and 17306 extension personnel, input dealers, local traders, Hon'ble MP, MLAs and other public leaders (Table 9.3).

Table 9.3 Extension activities conducted by KVKs of Rajasthan during 2023

Activities	Programmes organised (No)	Participation (Number)		
		Farmers	Extension Personnel	Total
Advisory Services	9212	1964513	2394	1966907
Diagnostic visits	810	7829	621	8450
Field Day	274	11684	551	12235
Group discussions	280	7487	394	7881
Kisan Ghosthi	421	24856	984	25840
Film Show	898	46808	777	47585
Self -help groups	114	2104	79	2183
Kisan Mela	38	42372	937	43309
Exhibition	236	399885	3672	403557
Scientists' visit to farmers field	2467	31258	1529	32787
Plant/animal health camps	36	1554	73	1627
Farm Science Club	14	374	8	382
Ex-trainees Sammelan	26	856	58	914

Activities	Programmes organised (No)	Participation (Number)		
		Farmers	Extension Personnel	Total
Farmers' seminar/workshop	99	4684	257	4941
Method Demonstrations	295	8467	328	8795
Celebration of important days	363	19468	758	20226
Special day celebration	218	12631	479	13110
Exposure visits	223	9325	341	9666
Others (pl. specify)	2486	189892	3066	192958
Total	**18510**	**2786047**	**17306**	**2803353**

9.2 Haryana

The mandated extension activities such as advisory services, field visits, field days, focussed group discussions, organization of kisan mela, exhibitions, technology shows, IEC campaigns for crop residue management, method demonstrations, etc were carried out by all the KVKs of Haryana during 2023 with the participation of 549893 farmers and 10511 extension personnel, input dealers, local traders, Hon'ble MP, MLAs and other public leaders (Table 9.4)

Table 9.5 Extension activities conducted by KVK of Delhi during 2023

Activities	No. of programmes	No. of farmers	No. of Extension Personnel	Total
Advisory Services	310	2311	4	2315
Diagnostic visits	95	1518	2	1520
Field Day	4	160	5	165
Group discussions	10	306	4	310
Kisan Ghosthi	15	922	8	930
Film Show	15	515	10	525
Self -help groups	10	306	4	310
Kisan Mela	2	895	20	915
Exhibition	3	2000	50	2050
Scientists' visit to farmers field	176	2312	10	2322
Plant/animal health camps	3	543	12	555
Farm Science Club	4	50	5	55
Farmers' seminar/workshop	2	350	20	370
Method Demonstrations	25	217	15	232
Celebration of important days	9	350	29	379
Special day celebration	10	795	47	842
Exposure visits	6	225	5	230
Any Other:Viksit Bharat Sankalp Yatra	34	40000	500	40500
Total	**733**	**53775**	**750**	**54525**

9.3 Delhi

The KVK, Delhi conducted mandated activities under extension alike of advisory services, field visits, field days, focussed group discussions, organization of kisan mela, exhibitions, technology shows, IEC campaigns for crop residue management, method demonstrations, etc involving 53775 farmers and 750 extension personnel, input dealers, local traders, and public leaders (Table 9.5).

Table 9.4 Extension activities conducted by KVKs of Haryana during 2023

Activities	Programmes organised (No)	Participation (Number)		
		Farmers	Extension Personnel	Total
Advisory Services	3039	74722	346	75068
Diagnostic visits	593	7070	262	7332
Field Day	164	6617	270	6887
Group discussions	393	8772	655	9427
Kisan Ghosthi	233	13014	421	13435
Film Show	97	3263	139	3402
Self -help groups	34	687	16	703
Kisan Mela	61	34897	600	35497
Exhibition	59	13926	309	14235
Scientists' visit to farmers field	1962	17995	749	18744
Plant/animal health camps	17	698	13	711
Farm Science Club	8	750	10	760
Ex-trainees Sammelan	24	1236	35	1271
Farmers' seminar/workshop	58	2919	25	2944
Method Demonstrations	281	11917	454	12371
Celebration of important days	140	10720	356	11076
Special day celebration	94	7262	240	7502
Exposure visits	210	10026	219	10245
Others	1651	323402	5392	328794
Total	**9118**	**549893**	**10511**	**560404**

CHAPTER 10

PRODUCTION OF SEED AND PLANTING MATERIAL

Production of quality seed and planting materials of crops, strains of livestock, chicks of poultry and fingerlings of fish has been one of the key activities which KVKs have been performing for the service of the farming community since their inception. It has not only promoted use of quality seeds of newly released varieties amongst the farmers but also helped KVKs to generate revenue and augment their revolving fund. Total 14207.02 qtls of quality seeds of various crop groups worth Rs. 496.51 lakh were produced during 2023-24. Cereal crops including millets seed dominated with more than 67% share in the total quantity of seeds produced followed by pulses (16.6%) and oilseeds (13.8%). The share of horticultural crops seed was 2.0%. The seeds produced were distributed to 8694 farmers in respective districts. The crop group-wise seed produced, its value and farmers benefitted in different states under Zone-II of KVKs are given in Table 10.1.

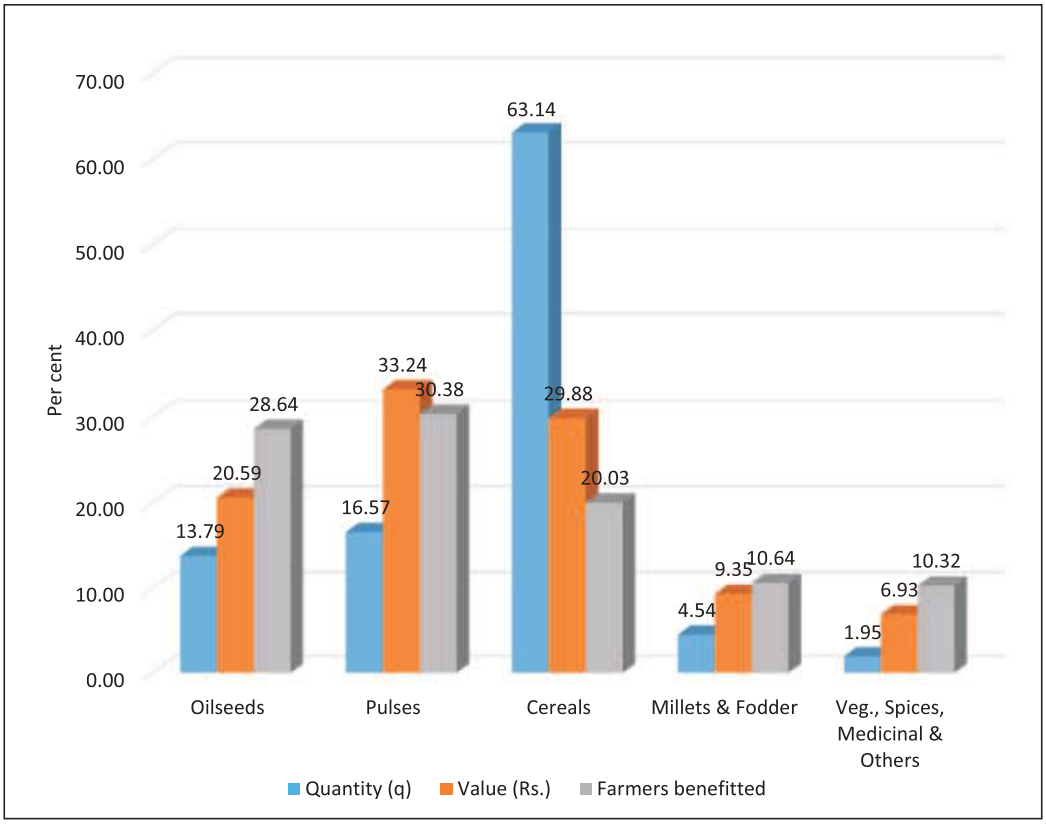


Fig. 10.1 Quantity, Value and Farmers benefitted-under different crop groups in 2023

Table 10.1 Crop Group wise seed production, their value and farmers benefitted during 2023

Crop Group	Quantity (q)	Value (Rs.)	Provided to farmers (No.)
Rajasthan			
Cereals	6154.15	12451262	2260
Fodder	6.1	108500	31
Oilseeds	1700.6	8979098	2490
Pulses	2086.64	11774127	2478
Seed Spices	90.71	1831608	70
Vegetables	72.32	1107730	445
Medicinal Crops	23.7	248175	116
Haryana			
Cereals	3330.27	7302564	235
Fodder	18.5	437500	0
Oilseed	258.56	12,45,807	0
Pulses	268	4732454	163
Commercials Crops	49.9	329065	0
Vegetables	70	45500	4
Delhi			
Cereals	56.6	183950	140
Vegetables	20.97	209700	262

Cereals

The seeds of barley varieties - RD-2035, RD 2907, RD 2786, RD-2715, RD-2899, RD 2849, DWRB-137, RD-2786, RD-2794, RD-2660 and BH-393; Rice varieties- Pusa Basmati-1847, Pusa Basmati 1509, PB 1692, PB 1509, BH-393, HKR-47, PR-126, PB-1718, PB-1121, PR 114, PB 1885 and PB 1886; wheat varieties - C 306, DBW-187, DBW-222, DBW-303, DBW-327, DBW-332, HD 3226, HD-3086, RAJ-4079, HPBW-01, HI-1605, KRL-210, RAJ 4079 (FS), Raj 4238, Raj-3077, Raj-4037, Raj-4120, Raj-4238, and WH-1124 were produced by KVKs. Total seed of cereals produced by KVKs was 9541.02.91 q seeds valued Rs. 199.38 lakh. This seed was provided to 2635 farmers (Table10.2).

Table 10.2 Seed of cereals crops, their value and farmers benefitted during 2023

State	Crop	Quantity (q)	Value (Rs.)	Provided to farmers (No.)
Cereals				
Rajasthan	Barley	1076.2	2101154	462
	Oat	9.29	46280	14
	Paddy	537.79	194600	26
	Wheat	3992.76	6408425	864
	Clusterbean	366.45	1061595	624
	Millet	171.66	2639208	270

State	Crop	Quantity (q)	Value (Rs.)	Provided to farmers (No.)
Haryana	Barley	91.8	178551	0
	Paddy	1271.11	2661112	64
	Wheat	1934.36	4398081	171
	Pearlmillet	33	64820	0
Delhi	Wheat	56.6	183950	140
Total		**9541.02**	**19937776**	**2635**

Oilseeds

Seed of oilseed crops of 1959.16 q worth Rs. 10224905 was produced by KVKs of Zone-II. Mustard with 1459.52 qtls seed constituted the bulk of the total seed produced with over 74% contribution followed by groundnut, soybean, sesame and taramira. The seed produced were provided to 2490 farmers. The important varieties of mustard of which seed was produced were RMR 2017-15 (Radhika). Giriraj, Brijraj, PM-30, CS-60, DRMRIJ-31, RH-725, DRMR 1165-40, Pusa Mustard-32, DRMR-1165-40, RH-0749 and RH-0406. Til varieties included RT-351 and RT-372 and those of soybean were JS-20-98 and JS 20 116. Groundnut varieties RG 559-3, GJG-19, PM-3, GJG-9 and RG-510 and Taramira varieties RTM-1351 and RTM-314 seeds were also produced (Table 10.3).

Table 10.3 Seed of oilseed crops, their value and farmers benefitted during 2023

State	Crop	Quantity (q)	Value (Rs.)	Provided to farmers (No.)
Rajasthan	Groundnut	231.92	1826312	14
	Linseed	1.25	7125	0
	Mustard	1200.96	6103135	2288
	Sesame	27.59	230690	102
	Soybean	201.64	635116	1
	Taramira	37.24	176720	85
Haryana	Mustard	258.56	12,45,807	0
	Total	**1959.16**	**1,02,24,905**	**2490**

Pulses

Total of 2354.64 qtls of seeds valued at Rs 16506581.0 of pulse crops comprising of chickpea (1306.58 q) greengram (823.14 q), blackgram (76.70 q), lentil (36.95 q) cowpea (4.25 q) and mothbean (100.02 q) was produced by the KVKs (Table 10.4). The seed production was more diversified in Rajasthan as compared to Haryana. These seeds produced were made available to 2641 farmers. The seeds of chickpea varieties CSJ-515, GNG-2171, GNG-2144, Kota Kabuli, RSG-991 and RSG 974; green gram varieties- MH-421, GM-4, GM-7, MH-1142, IPM 205-7 (VIRAT), MH 1142, IPM 2-03 and IPM-410-3; black gram varieties- KU-4, MU-2, PU-31, Pratap Urd-1, KU 4, Kota Urd-4 and Kota Urd-3; lentil varieties- RLG 5, KM-2, Kota Masoor-3 and Kota Masoor-4; cowpea varieties - RC-101 & RC-19 and moth bean varieties -RMO-225-1, RMO-435 were produced by the KVKs .

Table 10.4 Seed of pulse crops, their value and farmers benefitted during 2023

State	Crop	Quantity (q)	Value (Rs.)	Provided to farmers (No.)
Rajasthan	Blackgram	76.7	355852	80
	Chickpea	1241.08	5911878	661
	Cowpea	4.25	6120	21
	Greengram	620.64	4246917	899
	Lentil	36.95	286500	62
	Mothbean	100.02	896860	755
	Pigeonpea	7	70000	0
Haryana	Chickpea	65.5	2514954	10
	Greengram	202.5	2217500	153

Seed Spices, Vegetables and Medicinal Plants

The seeds of important seed spices crops were produced by KVKs of Rajasthan. They included coriander- Acr-2, RKD-18; cumin- GC-4; fenugreek - RMT 1, AM-3, Rmt-305 and AFG-3. A total of 161.21 q seeds valued at Rs. 2841738 was produced and made available to 105 farmers. Besides, seeds of garlic, onion, kanchri, spinach and potato and medicinal plants were also produced by the KVKs (Table 10.5).

Table 10.5 Seed of seed spices, vegetables and medicinal plants, their value and farmers benefitted during 2023

Seed Spices				
State	**Crop**	**Quantity (q)**	**Value (Rs.)**	**Provided to farmers (No.)**
Rajasthan	Coriander	48.93	348373	2
	Cumin	20.06	1401600	0
	Fenugreek	21.72	81635	68
Vegetable Crops				
Rajasthan	Garlic	70.5	1010130	35
	Kanchri	0.25	55000	150
	Onion	0.21	30000	20
	Spinach	1.36	12600	240
Haryana	Potato	70	45500	4
Delhi	Spinach	20.97	209700	262
Medicinal Plants				
Rajasthan	Medicinal Crops	23.7	248175	116

Fodder and Fibre

The important fodder crops of which seeds were produced included oats and berseem. JHO-822 was the important variety of oats and berseem local. A total of 24.60 q seeds produced were provided to 31 farmers valued Rs.546000 (table 10.6). Cotton was the important fibre crops of which 49.9 qtls seeds was produced by KVKs of Haryana worth Rs. 329065.0 (Table 10.6).

Table 10.6 Seed of fodder and fibre crops , their value and farmers benefitted during 2023

	Fodder			
	Crop	**Quantity (q)**	**Value (Rs.)**	**Provided to farmers (No.)**
Rajasthan	Fodder	6.1	108500	31
Haryana	Berseem	18.5	437500	0
	Fibre Crops			
Haryana	Cotton	49.9	329065	0

Planting Materials

The KVKs of Zone-II produced 4572316 numbers of seedlings and saplings of fodder, forest, fruits, vegetables, ornamental and medicinal plants during 2023 worth Rs. 143.71 lakh. These planting materials were provided to 26527 farmers. The important group wise and state wise state wise planting materials produced in 2023 are given in Table 10.7.

Table 10.7 Planting materials, their value and farmers benefitted during 2023

State	Group	Number	Value	No. of Farmers
Rajasthan	Fodder	557366	713036	382
	Forest	1308	34350	127
	Fruits	274752	8379655	8754
	Medicinal	11348	143940	352
	Ornamental	80468	728188	2215
	Vegetables	3524542	4063315	10610
	Total of State	**4175032**	**5682829**	**13686**
Haryana	Fodder	1010	30300	30
	Forest	3050	28700	504
	Fruits	459	11770	291
	Medicinal	200	0	100
	Vegetables	18055	18560	367
	Total of State	**22774**	**89330**	**1292**
Delhi	Fruits	710	21300	100
	Ornamental	50	100	10
	Vegetables	98298	196596	2545
	Medicinal	700	1400	140
	Total of State	**99758**	**219396**	**2795**
	Zone Total	**4572316**	**14371210**	**26527**

Vegetables

Seedlings of vegetables viz. drumstick, tomato, onion, chilli, brinjal, cabbage, cauliflower, broccoli, cucurbits, cabbage, cauliflower, bottle gourd, jackfruit, cole crops, cucurbits (muskmelon, watermelon, ridge gourd, pumpkin and bitter gourd) etc were produced by KVKs. A total of 3640895 seedlings were produced and provided to 13522 farmers which earned Rs. 4278471.0 to KVKs during 2023.

Table 10.8 Vegetable planting materials, their value and farmers benefitted during 2023

State	Crop	Number	Value	No. of Farmers
Rajasthan	Bitter gourd	767	5369	130
	Bottle gourd	71350	9451	170
	Brinjal	234981	174296	2365
	Broccoli	34808	74983	387
	Cabbage	112165	128628	551
	Cauliflower	80894	100098	820
	Chilli	614014	679331	2210
	Cucurbits	5000	5000	22
	Jack fruit	719	43800	64
	kakadi	575	4025	96
	Lettuce	6000	18000	64
	Muskmelon	581	4067	100
	Onion	337000	79500	104
	Pumpkin	538	3766	105
	Ridge gourd	1124	7868	125
	Sweet lemon	68	2,040	8
	Tomato	2023368	2718963	3211
	Watermelon	590	4130	78
Haryana	Bottle gourd	200	0	50
	Brinjal	10196	10196	112
	Chilli	5459	6364	75
	Tomato	2200	2000	130
Delhi	Bottle gourd	1400	2800	80
	Bitter gourd	600	1200	60
	Brinjal	24314	48628	330
	Broccoli	6298	12596	230
	Cabbage	8010	16020	320
	Capsicum	393	786	30
	Cauliflower	4335	8670	175
	Chilli	11000	22000	495
	Cucumber	625	1250	50
	Long melon	600	1200	40
	Sponge gourd	500	1000	50
	Tomato	40223	80446	685
	Total vegetables	**3640895**	**4278471**	**13522**

Fruits

KVKs produced large number of fruits saplings viz., aonla, bael, ber, citrus, custard apple, dragon fruit, ficus, fig, guava, guava, jackfruit, jamun. karonda, kinnow, lasoda, lemon, malta, mango, moringa, mosami, orange, papaya, pomegranate and sapota, etc. The total seedlings produced during 2023 were 276380 which were provided to 9436 farmers fetching a revenue of Rs. 8424495 to KVKs (Table 10.9).

Table 10.9 Fruits planting materials, their value and farmers benefitted during 2023

State	Crop	Number	Value	No. of Farmers
Rajasthan	Aonla	16292	806820	236
	Bael	2391	7950	13
	Ber	7189	201480	219
	Citrus	3000	20	12
	Custard Apple	11075	682375	338
	Dragon Fruit	3	75	0
	Ficus	95	4750	7
	Fig	100	1000	74
	Guava	12920	648655	703
	Jackfruit	3894	83840	334
	Jamun	5272	188025	334
	Karonda	7462	84740	115
	Kinnow	5258	214445	665
	Lasoda	3497	39040	19
	Lemon	18219	658310	895
	Malta	5924	296200	755
	Mango	19200	1312380	1085
	Mosami	73	6935	32
	Orange	7	665	5
	Papaya	141799	2847422	2639
	Pomegranate	9780	212258	179
	Sapota	1302	82270	95
Haryana	Guava	129	320	128
	Jamun	125	0	125
	Lemon	18	1440	16
	Mango	23	3450	16
	Papaya	164	6560	6
	Total	459	11770	291
Delhi	Papaya	710	21300	100
	Total Fruits	**276380**	**8424495**	**9436**

Ornamental crops

The KVKs of Zone II also produced large numbers of saplings of ornamental crops. Total 80518 numbers of saplings were produced and provided to 2225 farmers which earned Rs. 728288 to KVKs (table 10.10).

Table 10.10 Ornamental Plants planting materials, their value and farmers benefitted during 2023

State	Crop	Number	Value	No. of Farmers
Rajasthan	Amaltas	5	100	0
	Ornamental	532	7095	135
	Ardoo	1	25	0
	Areca palm	20	1700	10
	Ashok	132	2340	35
	Aurocaria	7	595	2
	Bottle palm	30	3300	19
	Bottlebrush	22	440	0
	Bougainvillea	10	300	5
	Cana lilly	7	385	3
	Chameli	30	1280	10
	Champa	26	1820	49
	Chandni	48	960	26
	Chandni	20	700	14
	Charysanthemum	6000	9000	20
	China palm	20	1300	6
	Chinese Rose	29	580	0
	Crotens	7335	77120	664
	Cycus Palm	22	660	0
	Double Firki Tager	17	340	0
	Drashina	14	910	4
	Enarmy	100	1000	40
	Firki Tager	43	860	0
	Gailardia	5000	7500	10
	Harsingar	7	385	2
	Hibiscus	23	1265	12
	Jhui	27	810	10
	Kachnar	9	180	0
	Kaner Yellow	70	1960	35
	Madhu Kamani	13	845	5
	Marigold	30132	25795	56
	Mogra	94	1880	24
	Money plant	30	1950	10
	Morphanki	38	2090	15
	Others	19806	455428	626
	Rat rani	65	1950	32
	Rose	10376	106490	312
	Severa Bell	37	1110	14
	Siras	239	4780	0
	Ticoma	32	960	10
Delhi	Merigold	50	100	10
	Total Ornamental	**80518**	**728288**	**2225**

Fodder Crops and Foerst Trees

The KVKs of Rajasthan and Haryana produced 558376 Napier grass and Guini grass which were provided to 412 farmers. Total 9377 seedlings of different forest crops were produced by KVKs of Rajasthan and Haryana during 2023 and provided to 636 farmers which earned Rs. 113335 to KVKs (table 10.11).

Table 10.11 Forest and Fodder planting materials, their value and farmers benefitted during 2023

State	Crop	Number	Value	No. of Farmers
Rajasthan	Guini grass	14326	31200	40
	Napier	543040	681836	342
Haryana	Napier	1010	30300	30
	Total Fodder	**558376**	**743336**	**412**
Rajasthan	Karanj	228	4560	0
	Khejari	212	26800	56
	Neem	153	2670	26
	Peepal	5	100	0
	Pipel	10	200	5
	Sagon	700	20	40
Haryana	Poplar	2050	28700	4
	Seesham	1000	0	500
	Total Forest	**4358**	**63050**	**631**
	Fodder & Forest Total	**562734**	**806386**	**1043**

Medicinal crops

The KVKs of Rajasthan and Delhi produced 12248 saplings of different medicinal crops and made available to 595 farmers. This resulted into an earning of Rs. 145340 (Table 10.12).

Table 10.12 Medicinal Plants planting materials, their value and farmers benefitted during 2023

State	Crop	Number	Value	No. of Farmers
Rajasthan	Curry leaf	3	60	0
	Harshringar	31	620	0
	Maruva	4	80	0
	Meetha Neem	20	400	10
	Neem	39	780	0
	Drumstick	11210	141590	342
	Tulsi	41	410	0
Haryana	Tulsi	200	0	100
Delhi	Drumstick	700	1400	140
	Total Medicinal Plants	**12248**	**145340**	**592**

Production of Bio-products

The KVKs of Zone-II produced 174077.70 kg of bio-products which was provided to 4890 farmers and others. It fetched a revenue of Rs. 1864274.0 to the producing KVKs. The details of zone are given in Table 10.13.

Table 10.13 Bio-products produced by KVKs of Zone II during 2022

Bio Products	Name of the bio-product	Quantity Kg	Value (Rs.)	No. of Farmers
Bio Agents	Trichoderma	2560	452400	327
	Vermiculture	2974.75	264070	270
	Waste Decomposer	8302	36040	423
	Total	**13836.75**	**752510**	**1020**
Bio-fertilizer	Vermiwash	2050		0
	Worms	1515.5	160220	195
	Bacillus	4.2	2625	21
	NPK Consortia	12.5	2750	25
	Phosphotika	76.9	15380	769
	Rhizobium	0.4	200	2
	Rhizotika	12.25	2450	195
	Vermi compost	156564.5	927199	2616
	Total	**160236.25**	**1110824**	**3823**
Bio-pesticide	Biomix	4.7	940	47
	Total	**4.7**	**940**	**47**
	Grand Total	**174077.7**	**1864274**	**4890**

Livestock

The KVKs of Zone-II produced numbers of cows, goat, sheep, poultry chicks, poultry eggs and pigs of improved breeds. Besides, they also produced 413000 fish of IMC. A total of 2151 farmers procured these improved materials from KVKs during 2023. The details of zone are given in Table 10.14.

Table 10.14 Production of livestock materials by KVKs of Zone-II during 2023

Livestock	Name of the breed	Number	Value (Rs.)	No. of Farmers
Cow	Cross Breed	40	772000	40
	Gir	33	918000	0
	Sahiwal	2	30000	0
	Tharparkar	1	2100	1
Ducks	Indian goose	3	1500	0
Goat	Barbari	1	13800	1
	Beetal	1	11400	1
	Sirohi	401	4675903	200
	Sojat	2	25915	2

Livestock	Name of the breed	Number	Value (Rs.)	No. of Farmers
Piglets	Large White Yorkshire	133	533900	21
Poultry-chicks	Chabron	480	69380	49
	Commercial Chebro	37	27750	6
	Indigeneous (Ankleshwar)	11800	1770000	610
	Kadaknath	3230	311305	461
	Kuroiler	400	72000	38
	Pratapdhan	11190	2546250	319
	RIR	5	2400	2
Poultry-eggs	Kadaknath	759	9240	150
	Pratapdhan	6884	73880	282
Rabbit	Newzealand	12	2900	3
	White	3	900	2
Sheep	Awishan	8	300000	0
	Marwari	5	15500	0
Total		35351	10462423	2147
Fingerlings	Catla, Rohu, Common Carp etc	413000	46250	4

Table 10.15 Quantity, value of seed produced by KVKs in 2023 and farmers benefitted

Cereals				
Rajasthan	Barley	1076.2	2101154	462
	Oat	9.29	46280	14
	Paddy	537.79	194600	26
	Wheat	3992.76	6408425	864
	Clusterbean	366.45	1061595	624
	Millet	171.66	2639208	270
Haryana	Barley	91.8	178551	0
	Paddy	1271.11	2661112	64
	Wheat	1934.36	4398081	171
	Pearlmillet	33	64820	0
Delhi	Wheat	56.6	183950	140
Pulses				
Rajasthan	Blackgram	76.7	355852	80
	Chickpea	1241.08	5911878	661
	Cowpea	4.25	6120	21

	Greengram	620.64	4246917	899
	Lentil	36.95	286500	62
	Mothbean	100.02	896860	755
	Pigeonpea	7	70000	0
Haryana	Chickpea	65.5	2514954	10
	Greengram	202.5	2217500	153
Oilseeds				
Rajasthan	Groundnut	231.92	1826312	14
	Linseed	1.25	7125	0
	Mustard	1200.96	6103135	2288
	Sesame	27.59	230690	102
	Soybean	201.64	635116	1
	Taramira	37.24	176720	85
Haryana	Mustard	258.56	12,45,807	0
Fodder				
Rajasthan	Fodder	6.1	108500	31
Haryana	Berseem	18.5	437500	0
Fibre Crops				
Haryana	Cotton	49.9	329065	0
Seed Spices				
Rajasthan	Coriander	48.93	348373	2
	Cumin	20.06	1401600	0
	Fenugreek	21.72	81635	68
Vegetable Crops				
Rajasthan	Garlic	70.5	1010130	35
	Kanchri	0.25	55000	150
	Onion	0.21	30000	20
	Spinach	1.36	12600	240
Haryana	Potato	70	45500	4
Delhi	Spinach	20.97	209700	262
Medicinal Plants				
Rajasthan	Medicinal Crops	23.7	248175	116

CHAPTER 11

SUCCESS STORIES

KVK-Banswara

1. Commercial Goat Farming

Mr. Naveed S/o Sh.Khalil Khan , 27 Years old youth of Village Laxmipura , District Banswara is graduate unemployed youth. He was farming on 4.0 ha land for earning his livelihood and he was also having 27 goats of local breed, but he was not satisfied in present earning. He decided to close his Goat Unit due to less income as compared to cost incurred by him. He came at KVK, Banswara for some new opportunities and contacted KVK Scientist, finally he agreed with Commercial Goat Farming. He participated in training Programme of 21 days in two phases on Commercial Goat Farming. After training he purchased 15 Sirohi goats and 3 breeding bucks for breed improvement and increased herd size.

KVK Imparted 21 days training on Commercial goat farming at KVK, Banswara in 2020 and provided 4 Goats and 1 Breeding Buck. Convergence was made with Department of Animal Husbandry, Banswara, Dept. of Animal Production, RCA, MPUAT, Udaipur, Livestock Research Station, Bojunda, Chittorgarh (RAJUVAS, Bikaner).

Output

Unit size	Produce (Year 2023)	Average Rate (Rs. /Buck)	Gross Return (Rs.)	Expenses (Rs.)	Net Return (Rs.)
42+8	35 Bucks and 25 Goats	7500/ Buck and 6500/ Goat	4,35,000 (Sold 32 Bucks and 30 goats)	1,96,200	2,38,800

* He kept 9 bucks for further breeding purpose

Outcome

Goat farming generated employment opportunity on regular basis for rural youth. Livelihood security has been provided to family members with improving nutritional status. Now he is getting nice social status in his community. He is so much motivated towards Goat farming that he is now extending his unit for Sirohi goat breed.

Impact

Looking to the success of his one year net return many other youth are adopting same profession at present. There are more than 8 goat farmer in Banswara and adjoining areas. Naveed himself also increased his farm size and supplies breeding buck for other farms.

KVK- Banswara

2. Gainfull Employment by Poultry Farming

Mr. Hitesh Rawat is 33 years old 12th passed unemployed Trible youth who decided for farming on his 2 acre of land. But, suddenly he realised alone farming was not fulfilling his own and his family needs. He was upset with the economic situation. Therefore, he wanted to start some new enterprise but was not able to decide what to start. He came to KVK, Banswara and contacted KVK Scientists. After discussion on his available resources, finally he agreed to adopt Commercial Poultry Farming. Thereafter, he was selected for vocational training on Commercial Poultry Production under ARYA, Project at KVK, Banswara. Entire course of training included theory and practical viz. Vaccination, Weighing, Cleaning, Feeding etc.

Technology, Implementation & Support: Imparted training on Commercial Poultry Production at KVK, Banswara and Department of Animal Production, Rajasthan College of Agriculture, Udaipur, along with visit of live demonstration units in 2020. He started

Commercial Poultry Farming with 1500 chicks in his self made Poultry shed. Further, he was also supported with 100 Kadaknath chicks (6 week age), Cage, feeder and water drinker with regular monitoring by personnels of KVK, Banswara.

Uptake, Spread and Benefit: After success of Mr. Hitesh Rawat 2 youths from Village also started Poultry units. Mr. Hitesh Rawat earned net return of Rs. 4,68,750 from unit of 1500 birds in year 2023.

Year	Unit size	Produce	Average Rate (Rs.)	Gross Returns (Rs.)	Expenses (Rs.)	Net Returns (Rs.)
2023	1500	18500 Eggs and 1200 Birds	Rs.15/Egg Rs.550/ Male Bird and Rs 400 /Female Bird	8,58,750	3,90,000	4,68,750

KVK-Barmer-I

डेयरी से मिल रहे हैं पुनिया को 35 लाख रुपये सालाना सकल आय

श्री महेंद्र सिंह पुनिया एवं उनकी धर्मपत्नी अणच कौर नेहरु नगर, बाड़मेर पेशे से दोनों अध्यापक है ओर उनके स्कूल में बच्चो को खेती एवं पशुपालन बनाये रखने के लिए एक ऐसा कारनामा किया जिसको देखकर आज हजारों पशुपालक उनकी तरह कार्य करना चाहते हैं। श्री महेंद्र सिंह पुनिया के दिमाग में बच्चों को पढ़ाते–पढ़ाते ऐसा ख्याल आया की उन्होंने एक डेयरी खोलने का विचार बनाया इसके लिए उन्होंने कृषि विज्ञान केन्द्र श्योर दांता बाड़मेर के पशुपालन विशेषज्ञ बी.एल. डांगी से संपर्क किया और डेयरी से सम्बंधित जानकारी हासिल की तब डांगी ने सलाह के तौर पर उनको अच्छी नस्ल की गायों जैसे थारपारकर, राठी, गिर, साहिवाल, होलिस्टन फ्रिजन, जर्सी आदि गायों से डेयरी शुरू करने की सलाह दी। तब से इन्होंने केन्द्र पर होने वाले डेयरी से सम्बंधित प्रशिक्षणों में भी भाग लेना शुरू कर दिया एवं वर्ष 2017 के नवम्बर माह में एक शहर के पास खाली पड़े प्लॉट को किराये पर लेकर 10 होलिस्टन फ्रिजन गायों से शुरुआत की लेकिन जिले में गर्मी के दिनों में तापमान की समस्या आने लगी तब पुनिया ने केन्द्र पर आकर सलाह ली और गर्मी के पुखते इंतजाम किये और अच्छा प्रबंधन होने से गायों का दूध बढ़ने लगा तब मन बनाया कि गायें और खरीदी जाये। तब गायों को रखने की जगह भी चाहिए इसके लिए इन्होंने बाड़मेर के नजदीक गेंहू गाँव में एक हेक्टेयर जमीन खरीद ली और वहां से बडी डेयरी चलाना शुरू कर दिया। गेंहू गांव में जाकर अच्छा फार्म बनाकर 10 गायें और खरीद ली जिससे दूध का उत्पादन बढ़ने लगा और आमदनी शुरू होने लग गई। आज पुनिया के पास 24 गायें होलिस्टन फ्रिजन एवं जर्सी नस्ल की 6 देसी गाये 6 भैंसें एवं 27 बछ्डियां हैं जो साल दर साल गायों में परिवर्तित होती रहती हैं। आज इनके पास कुल 63 जानवर हैं जिनका पालन कर रहें हैं। इन्होंने अपनी डेयरी का नाम नंदिनी डेयरी फार्म रखा है जो आज बाड़मेर में बच्चा–बच्चा जानता है।

1. **दूध**: पुनिया की डेयरी से रोजाना 200 लीटर दूध का उत्पादन हो रहा है जिसको 50 रूपये लीटर से शहर में घर–घर जाकर बेच रहे हैं, दूध की बिक्री से देखा जाए तो पुनिया को सालाना 32,40,000 सकल आय के रूप में प्राप्त हो रहे हैं।

2. **पशुओं का आवास प्रबंधन**: पशुओं का आवास वैज्ञानिक विधि से किया जा रहा है इनके द्वारा मुंह से मुंह पद्धति को अपनाते हुए पशुओं को पाला जा रहा है जिससे इनको दूध दुहने में, गोबर सफाई में, मूत्र एकत्रीकरण में आसानी रहती है साथ ही पशुशाला की धुलाई करने में आसानी रहती है। इन्होंने पशुओं के खाने की नांद के पास ही पशुओं के पीने हेतु पानी की प्रेशर नाद बना रखी है जिससे पानी के बिना नुकसान के पशु आसानी से पानी पी सके।

3. **हरा चारा**: गायों को पोषण के हिसाब से हरा चारा देना जरुरी होता है इसके लिए इन्होंने अपने फार्म पर रिजका बाजरी लगाई हुई है जो गायों को विटामिन एवं खनिज लवण की पूर्ति करती है और अच्छा दूध उत्पादन होता है।

4. **दाना**: पुनिया गायों को उच्च क्वालिटी का दाना खिलाते हैं साथ में कपास की खल, बाजरा अतिरिक्त देते है एवं गायों के अनुसार दाना देते है ये दूध देने वाली गाय को अलग दाना, ग्याभिन को अलग एवं बढ़वार वाली को अलग–अलग प्रोटीन लेवल का दाना खिलाते हैं। साथ ही ये गायों को 50 ग्राम मिनरल मिक्सचर देते हैं जिससे गायों में दूध बढ़ोतरी के साथ उनकी शारीरिक क्रिया भी सुचारू रूप से चलती रहती है।

5. **मुर्गीपालन**: महेंद्र की डेयरी में पशुओं के बाह्य परजीवियों की समस्या बढ़ने लगी जिससे पशुओं के दूध उत्पादन पर प्रभाव पड़ने लगा तब केन्द्र के विशेषज्ञों की सलाह पर इन्होंने ने अपनी दूधशाला में 20 मुर्गियों को लाकर रखना शुरू किया जिससे गायों के बाह्य परजीवियों की समस्या का समाधान हो गया। आज महेंद्र जी के पास 100 से अधिक मुर्गियां हैं जिनके माध्यम से परजीवियों के नियंत्रण के साथ–साथ इनको प्रतिदिन 15–20 अन्डे मिल जाते हैं जिनको 50 रूपये प्रति अंडा के भाव से बेच देते हैं। पुनिया ने बताया की डेयरी के अलावा मुझे अन्डे, मुर्गा एवं मुर्गी बेचकर लगभग 2,50,000 रूपये अतिरिक्त मिल जाते हैं।

KVK-Bharatpur

4. Innovations adopted in Farming

Name : **Neimi Chand**

Father's Name : Natthi Lal

Address : Village Sitara, Post-Pala, Tehsil-Kumher, District-Bharatpur, Rajasthan

Mobile No. : 8505022748

Innovations developed : In situ harvesting: Recharge tube well

Recharge of tube well, Roof water harvesting tank, Summer ploughing, Green manuring (Dhaincha), Vermi-composting, Soil test based nutrient application in wheat and mustard, Salinity tolerant variety of Barley(RD 2794), Improved variety of Mustard (DRMRIJ-31) and Use of MM, UMMB

Technologies modified

In situ harvesting: Recharge tube well, Ex- situ water harvesting and Improved varieties cultivation technology: Cauliflower, barley, Radish, Mustard Productivity Levels achieved in major income generating activity during the last five years.

Crop/Enterprise	Year				
	2017-18	2018-19	2019-20	2020-21	2021-22
Wheat (q/ha)	34.37	41.2	43.75	46.25	48.33
Mustard (q/ha)	25	24.5	26	28.33	28
Radish (q/ha)	390	354	450	460	450
Cauliflower (q/ha)		320	333	340	335
Buffalo Milk (Lt/year)	1230	1625	1985	1972	2100

Field levelling

Animal feeding

KVK-Bhiwani

5. Improvement have been effected for productivity, profitability and sustainability - enhancement

Name : **Rekha W/o Sh. Rakesh**
Village : Badala
Mobile : 9996555958
Age : 38yrs.
Education : 10+2

Area of Specialization: Mushroom Production

Experience (year): 5 yrs.

Situation Analysis: Low income

Technology implementation and support: Mushroom Production and Dairy farming

Uptake: She started production of mushroom 5 yrs. ago (from 2018). She has 6 sheds of mushroom (75'x22'), dairy farming of 1 sahiwal cow and 2 acre Guava orchards planted during 2016. She produced 25t mushroom from 120t of ready compost in 6 sheds. She has used 960 kg spawn during spawning

Benefits:

The farmer to get annual income from sale of Mushroom and dairy products. She faced problems of insect-pests and diseases like spring tails, wet bubble etc. With these enterprises she is getting annual income of Rs.11, 45,000.

Component	Area (acre)	Production (t)	Gross Return (Rs.)	Gross cost (Rs.)	Net Return (Rs.)	B:C Ratio
Mushroom production	6 (75*22')	25	1680000	10,90000	5,90000	1.54
Dairy Farming	1 cow	1800lt	90000	35000	55000	2.57
Guava Orchards	2	16	700000	200000	500000	3.5
Total			**2470000**	**1325000**	**1145000**	

KVK-Bikaner-I

6. Improved variety of Green gram- Virat and Mustard (Radhika)

Name of Farmer : **Shri Kan Singh**
Father's Name : Shri Jeth Mal Singh
Complete Address : Village –Kanasar Tehsil- Bikaner Pin(334001)
Land Holding : 4 ha
Livestock : 1 Goat (Sirohi) 2 Cow local breed

Technology demonstrated: Improved variety of Green gram- Virat and Mustard (Radhika)

Problem identified: Low yield of Kharif crop (Green gram) and water scarcity.

Description of technology:

Use of improved seed variety of Green gram Virat.

Seed treatment with Carbendazim 3g/kg seed

Soil treatment with Trichoderma viride 2.5 kg/ha with 110 Kg FYM (Well decomposed)

Recommended N:P:K (20:40:0 kg/ha) and use of Waste decomposer 50 g/ha, use of sulphur 40kg/ha., use of zinc sulphate 12.5 kg/ha.

Shri Kan Singh participated in trainings organized at Krishi Vigyan Kendra, Bikaner-I under NICRA Project on cultivation of different kharif and Rabi crops which covered all the farm operations technologies from land preparation to harvesting of the crop. The KVK scientists encouraged the farmer for soil testing and use of organic manures and also farmer were advised to apply balanced dose of fertilizer with improved variety Virat

Significant Impact of intervention: Increase in yield due to improved variety nutrient, pest and disease management.

Farmer is getting more profit and his socio-economic status is improving.

Soil health of his field is improving.

Yield and Economics: Farmer get 13q/ha yield. Cost of Cultivation Rs 20990/ha and Gross Income Rs 59611.4 /ha and Net income Rs 38621.4/ha

KVK-Chittorgarh

7. Integrated Farming system

Name : **Shri Devi Lal Kumawat S/o Sh. Prabhu Lal Kumawa**

Address : Village – Panchdevla, Post – Sukhwara, Teh. – Chittorgar District – Chittorgarh (Rajasthan)

Mobile No. : 7976246016

Background information about farmer field:

Land : 3.0 ha (Irrigated)

Irrigation facility : Tubewell-1, Well-1

Livestock : Buffalo (Murrah)-6, Cow -2

Farm machinery : Solar pump, Drip and Micro irrigation System etc.

Situation analysis: Mr. Devi Lal Kumawat is a progressive farmer of Panchdevla village of Bhadesar block, Chittorgarh district and he owns 2.8 hector of land as under:

I. Field Crops : 2.0 ha

II. Vegetable : 0.4 ha

III. Poly house Vegetable Cultivation : 0.2 ha

IV. Fodder crops and Dairy Farming : 0.2 ha

He is a dedicated agriculturist and actively involved in doing agriculture in an innovative way. The major crops cultivating is Soybean, Groundnut, Wheat, Mustard, Tomato, Chilli and Kheera in poly house. To protect the crops from various pests and diseases he used to spray pesticides at weekly intervals. This increases his cost of production and led to reduction in net income. Mr. Devi Lal Kumawat approached KVK to improve his agricultural activities and gain more income. In the Chittorgarh district, area under cultivation of poly house kheera is more. But higher pest and disease incidences and indiscriminate use of agrochemicals are very common in cultivation of Kheera, Chilli & Tomato. Moreover, farmers are lacking knowledge on pest and disease monitoring and Integrated Pest and Disease Management (IPDM) strategies. This increases his cost of production and led to reduction in net income.

Technology, Implementation & Support:

He advised to attend training Programmes conducted by KVK, Chittorgarh to develop knowledge and skill. He attended various training programmes viz., improved production technologies, Protect cultivation, eco-friendly management of pest and diseases, the importance of soil health management. I contacted to various agriculture scientists and extension officers several times and made through discussion regarding various farm components and developed a suitable IFS model consisting protect cultivation, vegetable cultivation, field crops, livestock for regular and sustainable income from farm. He started net house vegetables cultivating.

Uptake & Benefits :

He sale kheera & vegetables in market of Chittorgarh & Udaipur cities. He earned more than Rs. 6.50 lakhs net profit from per hectare. Other than poly house vegetable production now he raised 20.00 tons of cucumber and earned 4.0 lakhs gross income by selling of cucumber to the farmers during last year

Spread:

He was the first farmer in Panchdevla village of Chittorgarh district and protect cultivation, kheera & vegetable successfully and now more than 15 farmers from Chittorgarh and adjoining villages were motivated and approached him for cultivation technology. For kheera cultivation several farmers visited his farm and took technical advices.

Crop/Activity	Gross income (Rs./ha)	Net income (Rs./ha)	B:C Ratio
Kheera cultivation in Poly house	500000	340000	1.72
Field crops (soybean, groundnut, mustard, wheat)	140000	55000	1.65
Spices crops (Fenugreek & Garlic)	120000	65000	2.18
Vegetable cultivation (Broccoli & Chilli)	160000	75000	1.88
Dairy farming	85000	45000	2.13

KVK-Churu-I

8. Fodder beet: An option of low volume high nutritious fodder

Name of Farmer	:	**Sh. Bhom Singh**
Father's Name	:	Sh. Mangi Lal Singh
Age (years)	:	50
Mobile No.	:	9602240715
Complete Address	:	Village-Mitasar, Tehsil- Sardarshahar-331403, District- Churu, (Raj)
Land Holding	:	6.25 ha (Rainfed & Irrigated)
Livestock	:	9 Indigenous cow

Technology demonstrated: Seed, Seed treatment and sowing method

Problem identified: Less availability of nutritious green fodder for animals resulting in malnutrition of animals. Further, saline irrigation water, frost etc. are major constraints in production of green fodder.

Description of technology: Basic inputs like seed, seed treatment material were demonstrated at farmers field in Mitasar village with the follow of other recommended inputs and practices required for fodder beet cultivation under the proper guidance of KVK team.

Significant Impact of intervention: Increase in availability of nutritious and easily digestible green fodder during winter stress period for milking animals, resulted in improvement in body weight, milk production and timely conceive of females.

How the interventions minimized the impact of climate variability: Fodder beet can easily be grown under low temperate (0o to -20 C), Salt affected soil with less attack of termite. Availability of green fodder for dairy animals increased milk yield from 8 to 10 per cent.

Yield and Economics: Fodder Beet, a plant that produces tubers of an average weight of 6-8 kg. The crop has potential to produce more than 200 tons biomass per ha. It can be grown very profitably with poor quality of water as well as soil. The estimated cost of production is Rs 0.5 per kg of biomass. The crop has a very high water use efficiency of 28-32 kg green biomass per cubic meters of water. Cattle have shown 8 to 10 per cent improvement in milk yield. Between January to April when there is meager availability of other fodder crops, this crop is available extensively. With the recommended package of practices and prevailing condition in Churu. The green fodder yield (root + foliage) of 150 to 200 tone/ha can be achieved.

KVK-Churu-I

9. Progressive horticulture: A move towards success

Name of Farmer : **Mr. Onkarram**
Name of Father : Sh. Malaram
Age : 40
Address : Hudera, Ratangarh
Cropping system : Irrigated
Size of land holding : 4.5 acre

Introduction

Shri Onkarram belongs to a small family and due to limited resources he was unable to generate enough income for his family by farming. He concentrated on agriculture with 4.5 ha of land. Due to having low productive soil and poor management of farm without use of scientific technique, plant growth regulator, the production was not good. With facing difficulties in farm management decided to connect with KVK Scientist and attended different training programme related to protected cultivation and arid horticultural interventions on new advance technologies. By getting suggestions, he applied integrate nutrient and follow to pruning techniques and use of PGRs in cucurbitaceous vegetable production.

He also applied agricultural practices such sowing method, intercultural operation, and recommended fertilizer dose and plant protection measures. He successfully applied PGRs and pruning techniques in bottle gourd .The pruning technique promote highest female flower which produce high yield. Similar ethephone is beneficial to reduce male to female sex ratio and increase the fruit length. His hard work and dedication lead him to a happy and prosperous life and also become successful farmer of village Hudera. His inspiration towards success is being adopted by other farmers of village.

KVK Intervention

Training and method demonstration on protected vegetables production techniques related to arid region in zaid and rabi season. He also learned soil and seed treatment procedure for management of soil borne diseases. KVK also provided plant growth hormone (ethephone) and pruning techniques for bottle gourd.

Concern scientists visited the demonstration plots and also suggested timely measures related to production techniques.

Details of technology demonstrated

Mr. Unkar Ram was not aware about the pruning technique, weeds, insect and disease management and role of PGRs in horticultural crops . After the joined the training programme and took guidance to scientist of Krishi Vigyan Kendra, and he adopted all practices. For the implementation of demonstration provided technical guidance as well as inputs such as seed material variety PSPL, Fungicide Carbendazim 2 g/kg of seeds ,Micro Nutrient, and Trichoderma for soil treatment. It was designed in participatory mode with farmers to assess the spray of hormone Ethephon @100 ppm at 2-3 leaf stage and pruning of secondary branches at 30 and 45 days.

Impact

During Rabi 2023-24, the demonstration of Cucurbitaceous crops at farmer's field were completed in Churu district of Rajasthan. It was observed that the average yield of cucurbitaceous crop in 245 q/ha .The gross income was Rs.379500 ha. The horizontal spread of this technology is covered under area of 6 hectare. Sixteen farmers were adopted pruning technology and getting good production and market value of produce.

Outcome

Crops	Yield (q/ha)	Gross cost (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio
Farmer practices	160	46765	176000	129235	3.76
With Intervention: Spray of Ethephone and pruning techniques	185	48520	203500	154980	4.19

KVK-Delhi

10. Hi-Tech Nursery Farming: A Profitable Venture for Self-Employment

Introduction

Shri Ranjit Kumar is a resident of Bihar from rural environment. His father used to do flower work in Mohan Garden, Delhi. Also, flower plants are prepared and sent to small places. Along with studies, Shri Kumar used to help his father in his work, which helped the family financially. Due to this, Mr. Kumar started getting interested in this business and started searching for practical knowledge to take this business forward and set up his own big nursery there.

KVK intervention: Technology, implementation and support

After receiving information through newspaper about the "Skill Development Training" program organized under "Agriculture Skill Development Council (ASCI)" at Krishi Vigyan Kendra, Delhi (the authorized skill development training centre of ASCI, Govt. of India) in the year 2018, he applied for training. During this training, Shri Kumar gained detailed theoretical knowledge about high technology of horticulture, nursery production, preparation of seedlings in pots, preparation of vegetable seedlings, ornamental plants in nursery, pots, landscaping, mixture and management of pots etc. from the expert of Krishi Vigyan Kendra and obtained experimental information. At the end of the training, he passed the online assessment conducted and received a certificate.

Output & outcome

After receiving successful training from Krishi Vigyan Kendra, Delhi, Shri Ranjit Kumar, while continuing the flower work with his father, established a mini nursery in Mohan Garden with the advice of the scientists of the center. Initially his income was Rs 25,000 to Rs 30,000 per month, but later he made the nursery high class and with his technical and experimental knowledge, he is currently earning Rs 80,000 per month.

Impact

Shri Ranjit Kumar is regularly adding new dimensions to the unit with his high thoughts, thinking and practical knowledge and at the same time he is also providing employment to 4 to 5 people. Shri Ranjit Kumar has become a source of inspiration for the youth by establishing a successful nursery business and is also doing good work by taking contracts for landscaping gardening from government and private institutions.

Year wise details of income from Nursery Unit

Salary (Rs) / Years	2019-20	2020-21	2021-22	2022-23
Monthly Income	25,000	40,000	60,000	80,000
Annual Income	3,00,000	4,80,000	7,20,000	9,60,000

KVK-Delhi

11. Value addition of Fruits & Vegetables

Introduction

Transformation of Mrs. Savitri Rani, 46 years from devoted housewife into budding woman entrepreneur in just 2 years is the mission fulfilled. Sh. Santosh Kumar, her husband, had great expectation of making her a self reliant person.The potential, couple approached the Krishi Vigyan Kendra (KVK), Ujwa, Delhi for technical innovations and guidance. Which after sensing her enthusiasm advised her to contact Krishi Vigyan Kendra, Ujwa, New Delhi.

KVK intervention

Subsequently, Mrs. Savitri with her husband visited Krishi Vigyan Kendra, Ujwa and met the scientist team. They expressed their resolve to venture value addition of fruits /vegetables activity during the interaction with scientist team of KVK, Ujwa. After SWOT analysis of their case, KVK team prescribed them the roadmap to undergo training, form a firm, plan and start activities arrange source of funding from KVIC/NABARD/Bank/other sources; to undertake bran promotion, talk to experts for help. She religiously followed the road map prescribed to them by KVK.

Smt Savitri attended training at Krishi Vigyan Kendra (KVK), Ujwa on value addition in November - December 2012 In order to home up her skills and gain confidence; she took training on value addition of fruits and vegetables from KVK. The training tremendously helped her in fine tuning her food processing activity and starting vegetable / fruit preservation on commercial scale.

Output

To start up the venture KVK facilitated Smt Savitiri for online submission of loan proposal of Rs. 3.00 lakhs under the Pradhan mantri employment generation scheme of Khadi Village Industries Commission (KVIC) during the year 2013-14. She got financial assistance of Rs. 2.00 lakhs. After that she got FSSAI license for the sale of pickles and other products. With continuous support and handholding from KVK, Mrs. Savitiri has standardized her production techniques and got exposure for participation in exhibition and media publicity.

Outcome

Mrs. Savitiri is producing and packing 25 quintals of pickles; murrabas and chutebys etc. with an aanual turn over of Rs. 13-14 lakhs under the brand name “Savitiri Achhar” and engaged 4 permanent labours from the nearby area. It is spectacular performance because Mrs. Savitiri has achieved this level in 4 years with a financial help of Rs. 2.00 lakhs only from Khadi Village Industries Commission with the handholding of Krishi Vigyan Kendra. It is just beginning and holds great promise. It has brought prosperity in Mrs. Savitri's family

Impact

Smt. Savitri exhibits her products every year in Pusa Krishi Vigyan Mela, Agricultural exhibition arranged by KVK, different exhibition like Aam Mahotasav, Dilli Haat organized by State Government. She got an opportunity to exhibit her products in India International Trade Fair, where she was appreciated by

Income

S.No.	Enterprise	Total Production (q)	Gross Income (Rs.)	Net Income (Rs.)
1.	Food Processing (Different types of pickles, chuteny, murrabas & spices)	600000	1400000	800000

the Honble Chief Minister of the NCT Delhi. Smt. Savitri appeared on DD Kisan channel, her story was also aired by All India Radio in different program and covered by print media too. Now she developed self confidence and motivation to other needy women and youths. She become Master trainer in training conducted by Local NGO's at Nazafgarh, New Delhi.She was also invited as resource person in three week horticulture workshop at Daulat Ram College, University of Delhi.

Future prospects/Area of up-scaling

The technology of value addition of fruits & vegetables is disseminated in South West District of Delhi through trainings, extension activities and mass media. This technology is suitable for rural-urban women and unemployed youths. By adopting this technology in large scale, the nutrition and livelihood security of women and their family members can improve in the district.

KVK-Fatehabad

12. Adoption of Crop Residue Management after harvesting of paddy using different machineries

Sh Radheshyam is a progressive farmer. He is having 20.0 acre of cultivated land of its own. He is growing wheat, rice, guar moong and other crops. He emerged as Role Model for crop residue management in the Block Bhuna and motivated other farmers to adopt crop residue management especially in Rice. He started managing crop residues in the year 2017 by removing it from the field. Now from the last two years, he incorporates the crop straw in soils by using CRM machineries like straw chopper, mulcher, ZT seed drill and happy seeder. He emerged as a role model and created awareness among villagers about ill effects of straw burning and motivated other farmers to manage it by use of Straw chopper and happy seeder. As a result, 90 per cent villagers adopted CRM techniques and sowing of wheat was done by using CRM machineries . He obtained 48 qtl/ ha wheat yield in Happy Seeder sown field as compared to 45 qtl /ha obtained in a field sown by conventional method

KVK-Gurugram

13. Dev SHG of Dhani Chitrasen

Brief Introduction: Smt. Neelam wife of Sh. Rajesh Kumar lives in Dhani Chittersain (Bhorakalan) village of Gurugram district of Haryana. Her husband was not having a regular income which has always been a matter of concern for Neelam. Smt. Neelam was in search of ways to make her own earning and get her children good education. From various media sources like Doordarshan, radio and newspapers, she came to know about the success of Smt. Pooja Sharma from Chandu village (successful woman entrepreneur) and decided to pay her a visit to get the guidance for starting her own enterprise. Smt. Pooja shared her own journey from being just a housewife to a successful woman entrepreneur and suggested Smt. Neelam to visit KVK, Gurugram for further technical guidance and initial support to start an enterprise. In January, 2021 Smt. Neelam visited KVK, Gurugram where she was told to form a women SHG with at least 10 members and attend a 21 days training program on Value Addition under ARYA project.

KVK Intervention: Smt. Neelam was already heading a SHG named "Dev" in which there are 14 women members. She informed the group members about the ARYA scheme and asked every member to attend the training program. But to her disappointment, all other members showed their inability to go to KVK to attend the program for a period of 21 days. Smt. Neelam was very desperate to start her own work with or without the cooperation of other SHG members and decided to attend the training program all alone. Seeing her will-power, KVK included her name in the training on "Value Addition under ARYA project" organized during February, 2021. During 21 days training program, the trainees were given hands-on training on value addition of various fruits and vegetables to prepare products like pickle, jam, juice, squash, powder, candy, murabba, sauce, chips, papad, laddoo, soynut etc. and processing and packaging of spices. They were also given guidance on packaging, labeling and marketing of the value added products.

Output and outcome: After the successful completion of the training, Smt. Neelam did a market survey to get an idea about the demand and preference of Gurugram's customer related to processed food. To her observation, she found that majority of the women in Gurugram city are working and does not have time for cooking for their family so are always in search of processed and preserved foods. In addition, there is also demand of pure quality products that does not contain any harmful artificial color, flavor, preservatives and other chemicals. After the needful survey, she started her entrepreneurial work and prepared a variety of products like candy of aonla, mango, karonda; murabba of aonla, bael, carrot, beetroot; jam of apple, aonla, mango and aam panna, aonla laddoo, varieties of laddu (bajra, til, jwar, ragi) and pickles of various seasonal fruits and vegetables. In many of her products, she has used jaggery and desi khand in place of refined sugar which has raised the demand of her products. Desi khand (also known muscovado) is a type of partially refined to unrefined sugar with a strong molasses content and flavor. Unlike sugar, khand is not processed through bleaching process which takes away the minerals and often leaves harmful chemicals. Khand is considered good for health as it not being processed with sulphur. Black carrots which not only give beautiful red color to the aonla candy and anthocyanins present in the black carrot act as antioxidant and provide various health benefits like anti-inflammatory, anti-viral and anti-cancer benefits. Smt. Neelam after understanding the idea adopted the IARI technology of making red aonla candy and included this product in her enterprise and use this concept while marketing of her product. The year 2023 being celebrated as International Millet year has made Smt. Neelam to adopt millets also in her enterprise and she has started to make and sell millet (Jwar, bajra and ragi) cookies.

Initially basic spices like coriander powder, red chilli powder, turmeric powder and garam masala were

also prepared in her enterprise. Later on, She added other spices like chat masala, subji masala, chicken masala, meat masala, paneer masala, raita masala, kasuri methi, roasted cumin seeds powder and many more.

Smt. Neelam is also linked with DRDA and RUDSET agency at State level for marketing and training, respectively. After the set up of her enterprise, she was doing the processing work alone. But due to increased demand of her products, she later hired 5 women from the village for processing work and paid them on daily basis. Smt. Neelam has sold her products through melas viz. Trade fair, New Delhi in November, 2021; Noida Haat, Noida in Febraury, 2022, Pusa mela (IARI, New Delhi) in February, 2022; Saras Mela, Gurugram in April, 2022, Trade Fair in New Delhi, in November, 2022; Pusa Mela in New Delhi in March, 2023 and Saras Mela, Gurugram in October, 2023. Other than melas, she has also sold her products in village and nearby villages as per the demand. During 2021-2023, Smt. Neelam has sold various value added products worth Rs. 11-12 lakhs and earned a profit of Rs. 4-5 lakhs.

The success of Smt. Neelam as a woman entrepreneur is encouraging other women in the village to take up processing and value addition as an enterprise. Their work is setting an example in their society and motivating other persons also to take up same or some other entrepreneurial activity for income generation. She is playing a very strong role in making women aware of their potential and become a productive citizen of this country.

Her story has been covered in many newspapers like Dainik Jagran, Amar Ujala, Hari Bhoomi, Navbharat Times, Dainik Bhasakar etc. Her story was also covered by Akashvani, New Delhi in first episode of program "Nai Soch Nai Kahani- with Smriti Irani" (https://www.youtube.com/live/35pUR7bVr80?=F8jyS Y-UXztvahJc).

Smt. Neelam has been recognized and appreciated by Hon'ble Chief Minister of Haryana, Sh. Manohar Lal Khattar in 2022 which has created impact on other women also to create their own identity in the society. The details of the further awards received by her are given below:

i. She has been given the award of "Safal Udyami" by Rudset Institute, Gurugram in August, 2021.

ii. Her SHG "Dev" was given third prize with a cash prize of Rs 25,000/- by the Hon'ble Chief Minister of Haryana, Sh. Manohar Lal Khattar during SARAS mela-2022.

iii. She was given the Mission Life award in Food Mela organized by Nehru Yuva Kendra, Gurugram (Haryana) in June 2023.

iv. She was given appreciation award by MSME, New Delhi on the occasion of MSME Day in July, 2023

Impact: She is taking care of launching the new products after proper training and gaining proper scientific knowledge about the products and their processing. She also focus on the use of coarse millets like sorghum, pearl-millet, finger-millet, oat and other healthy food items like flax seed, ajwain, desi khand instead of chemically treated sugar while making cookies which are much healthier as compared to the maida cookies available in market. She has become the synonym of pure

Dev SHG at work and at different exhibitions at Gurugram

and quality products in Gurugram and nearby areas. She tries to prepare the products which are not only nutritious but also processed in a way so as to provide the maximum nutrients to the consumers.

She started earning and contributed to her family income which has raised the status of her family in the village. The earning of the SHG has increased the lending capacity of the group to its members and thus enhanced the micro-credit system among the community. Social taboos like women should not come in front of men and should not go out to attend meetings was overcome, which resulted in women empowerment. Observing her interest, State Government has supported us to put her stall in SARAS mela (Gurgaon), Trade Fair (Delhi), Pusa Mela (New Delhi) etc. which helped us in direct marketing and publicity of our products. She is an inspiration in her village for other rural women.

Smt. Neelam receiving third prize Rs 25000/- from CM of Haryana

KVK-Gurugram

14. Raising Vegetables seedling under Protected Structure: Avenues for higher income

Introduction

Mr. Deepak Kumar S/o Sh. Ram Avatar is a progressive youth with 26 years of age and resident of Banspadamka village, Pataudi block, Gurugram, district, having 0.80 ha of land in the village and having 2 cattles. He is graduate but unemployed and helps the family members for farming of pearl millet, wheat, mustard and seasonal vegetables. He is hard working and laborious person. He was interested to learn about modern techniques of agriculture specially raising the seedlings of vegetables and annual flowers because its higher demand by farmers & farm houses in nearest area.

K. V. K. Intervention

Then he approached the K.V.K, Shikohpur, Gurugram and took the training on "Protected cultivation" under ARYA scheme during-2022-23. During this training programme he learned practical knowledge on scientifically raising the seedlings of vegetables, annual flowers and sapling of ornamental and fruit plants in plastic seedling trays, bags, earthen and plastic pots in the soil & soil less media under Protected cultivation. after successful completion of training, KVK supported him some of the materials for preparation of protected structure such as insect proof net, shade net, polythene, por- trays and coco peat etc. After the training he prepared a protected structure in 100 m2 (20m x5m) area with the help of KVK. He started selling the prepared the seedlings of vegetables, annual flowers door to door near and sectors, Farm houses and nearby farmers. Time to time he took technical advises from the S.M.S. of K.V.K. with in a six months, he was fully trained and maintaining his above said unit.

Output and Out come

He made a protected structure with an area of 2000 m2 to raise the seedlings of vegetables, annual flowers and sapling of ornamental and fruit plants in poly bags. He started raising the seedlings of vegetables such as brinjal, chilli, tomato, capsicum for open field conditions and annual flowers in like marigold, chrysanthemum and winter annuals. Some foliage in plastic bags and earthen pots under protected structure. He was selling the seedlings to nearby farmers and flowers seedlings to societies by a rickshaw.

Economics of unit

Unit size	2000 sqm.	4000 sqm.
Year	2022-23	2023-24
Running cost viz. soil less media, pro trays, manure & fertilizers, pesticides, seed and labor	2,25,000.00	3,65,700.00
Total produce /annum (Seedlings) & sale value/plant	6.50-7.00 lakh @ Rs. 1.25	16.50-17.00 lakh @ Rs. 1.25
Gross income	8,12,500/-	20,62,500/-
Net income	5,87,500/-	16,96,800/-
B:C ratio	3.61	5.64

Raising seedlings under poly tunnels

Raising seedlings in open field condition

After successful running of nursery unit and sufficient income he purchased a motor bike. Recently he established another naturally ventilated protected structure & with an area 4000 sm. to meet the seedling requirement of nearby farmers with the District Horticulture department subsidy. During current year he raised about 16.50 - 17.00 lakh seedlings & sold @ Rs.0.75/seedling of improved vegetables varieties, and sold @ Rs.1.50/ hybrid vegetable seedlings varieties. with his net income Rs. 16,96,800/- net income. He purchased a four wheeler. He is providing employment to 5 persons (3 women and 2 youths) through his nursery unit.

Impact

After seeing his success, the youth of nearby villages are also approaching KVK for nursery training. 4 youth who also took training has applied for protected structure to District Horticulture Department, Gurugram for subsidies and will start soon. Some of them has just started raising the nursery in open fields and started earning their livelihood.

Raising seedlings in por-trays under protected conditions

Uprooting and packing of seedlings for sale

KVK-Hisar

15. Successful mushroom farmer entrepreneur

Name of Farmer	:	**Vikas Verma**
Father Name	:	Jai Singh
Village	:	Salemgarh
Age	:	25 years
Total land holding	:	7
Education	:	Doctorate
Contact No.	:	9992365285

Background

Mushrooms are gradually becoming popular as they are rich in minerals, vitamins, very low on fat and sugar. They are good source of protein and contain many essential amino acids. It is also known to have medicinal value and certain varieties of mushrooms can inhibit growth at cancerous tumor. Leisure time can be utilized effectively by involving in mushroom cultivation enterprise. Mushroom production is labour and management intensive. There is ample scope for mushroom industry to thrive successfully and can become a lucrative business for the unemployed rural youth, self-help groups, farmers who are in search of viable activities which are promising and giving good returns and an additional income source for the farmer. Mushroom cultivation can effectively utilize theagro residues for production of protein rich food and plays crucial role in management of agro residues. Mushroom cultivation is an eco-friendly activity, as it utilizes the wastes from agriculture which are available in huge quantities in every corner of the state and in turn produces fruiting bodies with excellent nutritional and medicinal attributes.

Introduction

VikasVerma s/o Sh. Jai Singh of village Salemgarh is a young, energetic and innovative farmer of 25 years old is involved in mushroom production from last six year. He is a successful farmer entrepreneur in addition to cotton-wheat cropping he has well established mushroom framing unit as well as is maintain high-tech net house for cucumber production.

Situation Analysis

Before starting mushroom cultivation,he is doing conventional farming with his father. He is not satisfied due to very less earning from this conventional system of farming and then he thought of doing something new independently to increase his income. Then he started mushroomfarming from its own knowledge about mushroom but he is not incurred loss. In 2016 team of KVK Hisar visited the village and he come in contact with KVK scientist. Then Team KVK analysis the situation of his farm and guided him how to start mushroom farming unit and net house to forproduction fruit and vegetables. Then he take trainingfrom KVK started mushroom farming and cucumber production in net house.

Technology implementation and support

Vikas Verma came in contact with KVK scientists in 2019. After that he never footed back in utilizing latest agricultural technologies at his farm. He got various kind of trainings from KVK Hisar. After the consult of KVK Hisar he started mushroom farming and advanced farming in net house instead of conventional farming. He has good linkage with KVK, Hisar and KVK scientists has developed his farm as an Extension /demonstration activity centre. The KVK scientists organize different extension activities and field days of different crops at his farm and many farmers of nearby areas actively participate in these activities. With the cooperation of his father and other members, he is a successful entrepreneur under the guidance of KVK scientists.

Uptake

He is fully utilizing the natural conservation technology as drip in cotton and horticultural crops, Bed planting and Laser leveling in wheat crop, Dairy, vegetable production, Integrated Pest Management, Integrated Nutrient Management in different crops. So that he has totally diversified his agriculture in respect of adopting all components of Integrated Farming System. This all has been adopted by him on the advice of KVK scientists and his keen interest in scientific agriculture. He is also growing fodder crops like Sorghum, Berseem, Maize, Oat etc. He has a poultry production unit of 10000 birds and in dairy he is rearing 12 buffaloes and 3 cows. He regularly uses mineral mixture in the feed of animals.

Spread

MrVikasverma provides training to others farmer about mushroom farming till now he train almost 3500 person. By seeing the benefit from enterprises mushroom farming and protected cultivation in net house more farmer start mushroom farming unit along with crop production for increasing his income. More than 2000 farmers per year make the visit to the mushroom farm of vikas as well many officer from other department. He is awarded with various award at university level from worthy vice chancellor of CCS HAU Hisar and Governor of Haryana state. He use to participate in various trade fairs and kisanmela and motivate and guide the other farmers.

Economic benefit

Presently, VikasVarma is earning a handsome earning of Rs 37,10,800/- per year from cotton-wheat, mushroom farming unit and cucumber cultivation in net house. He increase his income by almost three time.

Before Intervention					
Component Description			**Benchmark(BaselinePeriod 2016-17)**		
COMPONENTS	**NAMES**	**AREA/ACRES**	**PRODUCTON (Q/Litre/No.)**	**GROSS INCOME**	**NET INCOME**
Field Crop1	Wheat	2	26	49,400	39000
Field Crop2	Mustrad	3	20	80,000	60000
Field Crop3	Bajra	2	10	15,000	13000
Livestock 1	Cow	2	2400	96,000	75000
Livestock 2	Buffalo	1	3600	1,20,000	80000
Mushroom farming	Mushroom	3(Shed)	150	13,50,000	8,00,000
TOTAL		13	6096	17,10,400	10,67,000
After Intervention					
2).Status					
Component Description			**Benchmark (BaselinePeriod 2022-23)**		
COMPONENTS	**NAMES**	**AREA/ACRES**	**PRODUCTON (Q/Litre/No.)**	**GROSS INCOME**	**NET INCOME**
Field Crop1	Wheat	2	32	64,800	48,900
Field Crop2	Mustrad	3	24	88,600	74,500
Field Crop3	Bajra	2	10	18,700	14,600
Livestock 1	Cow	2	2400	1,04,000	86,800
Livestock 2	Buffalo	1	3600	1,27,000	86,000
Mushroom farming	Mushroom	3(Shed)	400	36,00,000	27,00,000
Net House (Cucumber)	Net House (Cucumber)	1	500	12,00,000	7,00,000
TOTAL		**13**		**52,03,100**	**37,10,800**

Award and recognization: For his dedication in scientific agriculture he got appreciation Governor of Haryana Vice Chancellor, CCS HAU Hisar. He has set an example to other farmers of Hisar district that nothing is impossible in agriculture. Always hard work pays a lot in agriculture.

KVK-Jaipur-I

16. Production Technology of Cucumber in Polyhouse

A group of enthusiastic unemployed rural youths of aged 30-35 years of Govindgarh Panchayat Samiti attended a skill training on 'Protected Cultivation' of high value vegetables crops organized by Krishi Vigyan Kendra, Chomu in the year 2016-17. During the programme, participants were exposed to the scientific cultivation practices of high value vegetables in protected and open field. The exposure during the training programme encouraged the youths to start cultivation of high value commercial vegetables in poly-houses with water harvesting structure. One of the youth named Mr. Jagdish Prasad Yadav, native village of Itawa Bhopji, District Jaipur established poly-house of 4,000 sq. meters area with water harvesting structure and started the off-season cultivation of cucumber by adopting improved package of practices of cucumber. During the crop season, he has harvested 10-11 times during the period of 2017 to 2023 with two crops every year taking gross income of Rs. 10-12 Lakhs per year by incurring the expenditure of Rs. 4-6 Lakhs per year with a net profit 5-6 Lakhs per year from the cucumber cultivation. Mr. Yadav got average cucumber yield 32-36 tonne/acre per season and selling price was Rs. 16 to 35 per kg. in local and Jaipur Mandi market. His cost benefit ratio always remains 3.5 to 4:1.

Mr. Yadav and his colleagues got several problems during the production such as heavy infestation of nematode during the cultivation time, severe incidence of fungal disease and scarcity of water due to uneven rainfall during the monsoon. But this group with the leading of Mr. Yadav took challenge and with consultation of KVK scientists as well as IARI scientist timely and solved the problems by adopting soil solarization practices, using soil beneficial bacterial culture such as pseudomonas, trichoderma, verticiliumm and neem cake. To solve the problem of water scarcity, he precisely used the water with drip irrigation and mulching practices.

Being impressed with the success of Mr. Yadav, neighboring youths and farmers also started the technology dissemination and having their own encourage uplifting the socio-economic status; the youths are the model of unemployed youth and farming community for livelihood security.

KVK-Jaipur-II

17. Integrated Farming System

Name	:	**Mohan Gurjar**
Age	:	56
Phone	:	9929309697
Education	:	8th
Address	:	Villege-Samred Kalan, P.S. Jamwaramgarh, District- Jaipur
Land holdings	:	2.4 ha
Livestock	:	Buffalo- 02, Cow- 2 & Goat -04
Farming experience	:	28 Years

Introduction

Shri Mohan Gurjar, a dedicated and innovative farmer of the village Samred Kalan of Jamwaramgarh block, Jaipur district in Rajasthan. He completed his Middle School and chosen agriculture as profession and started devoting his time focusing on a better farming. He is having 2.4 hectare land. Though he was cultivating traditional crop like Bajra, Guar, Wheat, Barley, Fenugreek and Mustard in his farm regularly, he was not getting the expected income. He felt that doing agriculture through conventional method minimized the yield and income. It is also associated with low productivity, increased cost on agriculture inputs and poor or no utilization of existing farm resources available in the farm.

KVK Intervention

To overcome the problems faced by him, he started searching the new method which improves the farm productivity, soil health and income. He had visited KVK, Jaipur-II during 2019 and has got the chance to learn about the new technology. From 2019 onwards, he is having close contacts with the KVK for the technical help, up gradation of new components and guidance. He has been attending lot of trainings, seminars, workshops conducted by the KVK. With the guidance of KVK, in a total of 2.4 hectare of land area, he practices Integrated Farming. He was growing field crops like Bajra, Guar, Wheat, Barley, Fenugreek and Mustard crops. He was also cultivating the fruit crops like Aonla and acid lime along with seasonal vegetables. He maintains a animal unit with 02 buffalo, 2 Cows and 04 goats. He has also established a Vermicompost production unit. As a progressive farmer he always tries to improve his skill and eager to know every aspects of farming from various sources, trainings, experts, department personnel etc. He eventually set a good example of improved cultivation/farming by incorporating that knowledge with his own innovation in front of other farmers. He adopted so many new technologies in farming. Shri Mohan Gurjar is integrating all the existing resources available in his farm completely for the economic and ecological improvements for the past 4.0 years.

Output

The adoption of integrated Farming System involving minimum use of external inputs, crop residue recycling and organic practices can improve economic issues. With this challenge, Shri Mohan Gurjar is integrating all the existing resources available in his farm completely for the economic and ecological improvements for the past 4.0 years. The Major outcome

of Integrated Farming System found by Shri Mohan Gurjar is increased the sustainable income from various components round the year. The cost of production has been drastically reduced due to reduction in external output purchase as the recycling of most of the available resources was done for the production.

Outcome

He is helping in the dissemination of technology in and around the villages. The spread of technology from farmer to farmer has gained momentum annually. He is giving training to other farmers who are really interesting in agriculture in the village.

S.No.	Crop	Area	Gross return	Net return
1.	Crops (Bajra, Guar, Wheat, Barley, Fenugreek and Mustard)	3.5 ha	224400	165550
2.	Seasonal Vegetables	1.25 ha	222000	117500
3.	Animal production	-	308300	146825
4.	Fruit Production (Anola & Acid lime)	0.5 ha	-	-
Total			754700	429875

Impact

Other farmers of Samred Kalan follow up the Shri Mohan Gurjar & adopted the new technology for higher production & income.

KVK-Jaisalmer-I

18. Scientific Animal Husbandry for Improved Livelihood

Farmer's Name	:	**Bhagwan Singh**
Father's Name	:	Deep Singh
Address	:	Village Gorera District Jaisalmer
Mobile	:	9983413249
Age	:	34
Education	:	8
Innovative Steps	:	Animal Husbandry
Income in the past	:	Rs. 2.11 Lakh
Current Income	:	Rs. 13.62 Lakh

Introduction: Bhagwan Singh, son of Deep Singh, resident of Gorera district Jaisalmer. They had less land useful for farming and due to its low productivity, they took up animal husbandry as their main occupation. In which goat rearing is their main component. In 2019, indigenous breed of goat was reared by them. He also rears Murrah breed of buffalo. Along with reduced productive and reproductive performance of native breed goats, body weight gains slower than improved breeds. The calving rate of goats is also low, about once a year or even less. Due to low body weight, their selling price was low due to which the net income and profit per cost was less. His total annual net income was Rs 2 lakh. Due to this their financial condition was also becoming weak.

KVK intervention: In 2019, Bhagwan Singh started participating in activities and trainings related to animal husbandry at the Agricultural Science Center, Jaisalmer, due to which he started getting information about Scientific animal husbandry practices. They started discussing with the scientists of the center about the problems being faced in goat rearing and about low production from animals by their practices. The scientists of the center advised him to adopt advanced breeds like Sirohi and Barbari in goat rearing. Gave information about methods of making proper housing system to protect animals from stray animals as well as adverse weather situation, Methods of preparing balanced diet including all the necessary vitamins and minerals required per animal, fodder management in terms of silage and hay, Breeding related problems and their management, Disease prevention and vaccination, deworming and proper management to cope up changing climate like extreme heat and cold waves. Scientists also gave information related to modern animal husbandry for Murrah breed of buffalo like balanced diet management, artificial insemination, prevention of diseases etc. so that milk production can increase. Suggested the method of using waste obtained from animals to make fertilizer. From time to time, scientists visited their farms and diagnosed the problems they were facing related to animal husbandry practices.

Output: To start goat rearing as a business, Bhagwan Singh started rearing 50 Sirohi goats in place of the native breed in 2019. He got a permanent shed constructed for residence. Each goat gets ad libidium dry fodder, 1 kg Green fodder, 150-200 grams concentrate. 100 g Cotton oil cake, 10-15 grams mineral mixture per day as a feed. Started making the concentrate and store green fodder as hay to be fed to the animals himself. Vaccinated his animals against FMD(Footh and mouth disease), P.P.R (Pestes des petits Rumination)at the appropriate time to protect against diseases etc. Giving liver tonic to kids of goat to increase their digestive power. Deworming is done with Triabendazole medicine every 3 months. To know the heat of the goat, teaser goat is used and for breeding, pure breed buck is used. In the year 2020, he started dairy farming as a business by purchasing two buffaloes. Each buffalo gets 10 kg dry fodder 3 kg Green fodder 2.5-3 kg Concentrate, 1 kg. Mustard Oilcake, 100 g mineral mixture Fed per animal per day respectively.

They are earning additional income by making manure and selling cow dung from the waste obtained from animal waste like urine, feces and leftover fodder. Presently Bhagwan Singh has 170 goats and 5 buffaloes due to which his total annual net income is Rs 13.62 lakh.

Before intervention

S.No.	Animal	No.	Production litres/animal		Selling rate		Cost of production (Rs,	Gross Income (Rs,	Net Income (Rs,
			Number or milk ⊣li,	Manure (Q.)	Number or milk ⊣li,	Manure (Q.)			
1	Goat farming	42	34	100-8	10000	200	195960	360160	164200
2	Buffalo rearing	1	2160	89	36	180	46700	93780	47080

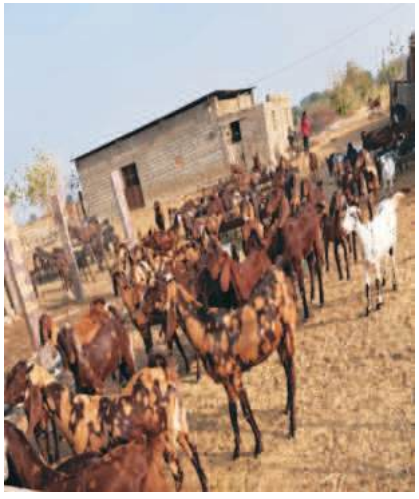
After Intervention

S.No.	Animal	No.	Production litres/animal		Selling rate		Cost of production (Rs,	Gross Income (Rs,	Net Income (Rs,
			Number or milk ⊣li,	Manure (Q.)	Number or milk ⊣li,	Manure (Q.)			
1	Goat farming	170	135	860	12000	250	756600	1835000	1078400
2	Buffalo rearing	5	8910	540	45	200	225000	508950	283950

Outcome Rearing of good breed goats and buffaloes instead of local breed animals resulted in increase in net income, the main reason being higher production and purchase rate. Due to which they earn more income than before. For this, Bhagwan Singh has provided employment to about 4 people every day.

Impact

Seeing the success of bhagwan Singh in animal husbandry using scientific methods, nearby cattle farmers also started rearing goats of Sirohi breed. At present Sirohi breed is being reared by 7 dairy farmers.



Goat rearing in farm of sirohi and barbari breed

Isolated kids shelter

Stall feeding of goats

KVK-Jhajjar

19. Diversified Agriculture: Horti-Dairy System

Name	:	**Mr.Siddhartha Malhan**
Father Name	:	Sh. Sunil Malhan
Address	:	Green Field Organic Farming VPO - Silani, District Jhajjar
Education	:	Post graduate
Land holding	:	15 acre

Mr. Siddhartha Malhan a successful Diversified farmer doing Dairy farming (Indigenous cow) along with cultivation of horticultural crops for income generation.

KVK intervention –Earlier Mr. Siddharth used to take two crops namely wheat and bajra from his field and had one buffalo to meet home needs of milk and milk products. Mr. Siddharth came in contact with the scientists of KVK, Jhajjar in 2016 and KVK scientists encouraged him to take up Dairy farming and cultivation of horticultural crops for higher income.

Output

- After getting know how from scientists of KVK, Jhajjar, he started Dairy farming and scientific cultivation of horticultural crops with his family support since 2019.
- Now, he is growing wheat in only 2.00 acres and bajra and oatseed production on 3.5 acres each.
- Established net house on 3.5 acres and growing capsicum (red and yellow) and cucumber.
- Open cultivation of watermelon and other cucurbits on 3.0 acres.
- At present he is having dairy farm unit of 250 animals and a chilling plant.
- Established Milk processing plant with a capacity of 25,000 litres of milk/day.
- At present, he is processing 40,000litres of milk/day in the form of paneer, butter, ghee and curd after procuring milk from more than 50 micro dairy units.
- He is serving more than 12,500 families daily in Delhi NCR and Chandigarh.

Outcome

- He had an earning an annual income worth Rs. 40 crores from all the sources during 2022.

Impact

Earlier, Mr. Siddhartha Malhan used to get annual income of Rs. 2,34,500 from wheat, bajra and milk etc. He faced problems low returns. Now, With crop diversification and livestock management, he is getting annual income of Rs 40 crores. He is a successful dairy farmer and vegetable grower and is a source of inspiration for the other youth. Inspired by Mr. Siddharth, more than 50 rural youths have started dairy farming and crop diversification .

KVK-Mahendergarh

20. Beekeeping: An Alternative Income Generating Enterprise

Name of Youth	:	**Naresh**
Address	:	Village Paiga, Block- Mahendergarh, District- Mahendergarh (Haryana)
Mobile	:	9467175141
Geo-coordinates of established unit	:	28°25'14.4" N 76°13'92.6" E

Background of Youth: Income generation is important for any agricultural activity. Apiculture is proven to be an income generation enterprise under favourable conditions. Mahendergarh is an agriculture based district. Out of the total area, mustard is cultivated in about 90 thousand ha area which is a potential crop for bee keeping. Along with this other crops like acasia, ber, bajra and cotton are grown in large areas. In Mahendergarh District where land holding is less than 0.50 ha, bee keeping provides excellent source of employment for the rural land less youths and enhances income of farmers. Due to its low cost and higher returns, the bee keeping is projected as an important subsidiary or even major occupation as compared to other agro-based industries. Mahendergarh district has vast resources of bee flora and there is a great scope for further expansion of bee keeping technology implementation and support graduate by in district quantification.

Naresh age 34 years is a job aspirant youth of village Paiga, District Mahendergarh. His family has small land holding of 1 acre rain-fed agricultural land and is rearing two buffaloes for domestic requirements. By adopting traditional farming practices, he realized that income was insufficient to support the need of his family. He came in contact with the Krishi Vigyan Kendra, Mahendergarh through Kisan Mela. He Participated in field demonstration and training of scientific bee keeping. Based on his skill and knowledge, he was being advised and encouraged to establish bee keeping unit at his farm by KVK, Mahendergarh.

Initiative: Vocational training of five days duration was conducted by KVK, Mahendergarh in 2019-20 to impart knowledge and skills related to types of bees, classification, bee hive structure and management, life cycle of various categories of bees, parts of bee hive box, accessories required for honey bee keeping and honey extraction etc. The trainees were also taken to Integrated Bee Keeping Development Centre, Ramnagar, Kurushetra, Haryana for practical exposure. After successful completion of the program the participants were provided with a certificate and training literature to use as a ready reckoner to have firsthand information regarding the honey bee keeping. During the year 2019-20, under ARYA project rural youths from Mahendergarh were given training and twenty one youth identified to support with bee hives boxes. Naresh was also one of the beneficiaries who got material assistance under the project. Regular follow up visits were made by the scientists of KVK to the units established and advisory was also provided for effective maintenance of the bee hives.

Uptake: He started his journey in the year 2019 and established a Bee Keeping unit with 50 boxes. He achieved the confidence and there was no look-back. Now he is an established entrepreneur with a net amount of Rs 1100000 with a unit of 550 boxes. He was provided with following material assistance under ARYA Project.

Benefits: He is getting approximately 35 kg honey per box and selling the raw honey at a cost of Rs 100 per kg. On an average rearing cost of one box per year is 1500/-.

The input cost and income of Amit Yadav by adopting Beekeeping enterprise are given as follows:

Impact factor	Before start of ARYA	After adoption of ARYA (2022)
Name of enterprise	Bee Keeping	Bee Keeping
Size of enterprises (No. of bags/beehives/ fingerlings/ area etc.)	25 beehives	182 beehives
Individual/Group	Individual	Individual
Yield	370 kg	6370 Kg
Cost of Production / unit	38,000	345800/ annum (Rs.)
Gross income	48100	916800/ annum (Rs.) (including sale of Bee Wax Rs. 25000)
Net income	10,100	571000
Marketing	Local nearby villages	Processed honey and wax is sold in NCR market
No. of functional unit at start: Nil		
No. of functional unit at present :01		

Spread: Mr Naresh is very much satisfied adopting the enterprise. Presently, he trains the local rural youth to cultivate honey and is associated with Krishi Vigyan Kendra, Mahendergarh as a resource person in vocational training programmes on Bee keeping. He is motivating farmers to adopt the scientific method of beekeeping by visiting the KVK. By seeing the economic benefits accrued by the young bee keeper, other youths are also showing interest in bee keeping in their fields. Three more youth undertook the enterprise. It is one of the significant achievements of KVK.

KVK-Pali-II

21. Integrated Farming System

Name	:	**Sushil Choudhary**
Address	:	Village - Raipur (Hemlet : Bera Naya Giniya) Tehsil- Raipur, District- Beawar
Phone No.	:	9001175222
Age	:	34
Education	:	Bachelor (B.A.)
Land holding	:	2 ha.

Situation Analysis

After graduation, Shri Sushil Choudhary went to south India in search of bread and butter for his family. He did started business of jewelry and lending of credits in Chennai but could not succeeded. He came back to Raipur. After repeated failures, he started feeling quite disappointed. He was in search of job for respectful earning for his family. He initiated agency of tyres company but not satisfied with his income. So, he thought about supplementary income earning through farming.

Technology

Mr. Sushil Chaudhary, a farmer from Raipur tehsil of Beawar district, participated in Exposure visit cum training program at the Central Sheep and Wool Research Institute, Avikanagar Tonk under the CAT scheme of NABARD by the Krishi Vigyan Kendra, Raipur. He Visited the demonstration units at Avikanagar tonk received technical training from the Krishi Vigyan Kendra and also participated in the extension activities organized by the center.

Front line demonstration of sesame variety (RT-351) was also conducted at farm of Mr. Sushil Choudhary by KVK, Raipur. He also cultivated fennel, cumin, mustard, moong, Bajra crops and as well as doing animal husbandry.

Implementation

He have 26 goats of Sojat breed and also working on conservation and promotion of Sojat buck breeders as well as also providing Improved breeds to the farmers. He also have vermicompost unit in which he is preparing vermicompost and providing it to the farmers. He is also providing vermiculture to the farmers to set up a new vermicompost unit in their fields. He cultivated Napier grass with the advice of scientists of Krishi Vigyan Kendra. This grass proved to be very useful as an alternative to green fodder during summers.

By Seeing the good production of Napier grass in summer, many nearby farmers adopted it. By planting Napier grass, his farm is supplying with fodder throughout the year and also saving Rs 25,000/- in a year.

Support

His dreams were very big, then he made contact the Krishi Vigyan Kendra, Raipur. There he met the Senior scientist and Head of the KVK. After which he thought of doing farming. Whenever training and extension activities were organized by the KVK, Mr. Sushil Choudhary started participating in the same. He thought about goat farming as alternative for income earnings but in his Seervi caste it is not treated as respectful profession. But against the tide, he firmly determined to do scientific goat farming by getting trained in scientific goat farming. He kept getting technical advice from the KVK time to time, due to which today he is emerging as a progressive farmer of Raipur Tehsil.

Spread

He adopted Integrated Farming system in the year of 2023,under the guidance of the Krishi Vigyan Kendra, Raipur. And managed his farm scientifically as well as gain benefit of Goat rearing by following these scientific approaches such as housing, feeding management, health management, vaccination, hygiene and reproduction management of Goatery unit. All the records is also being

managed right from initiation including progeny birth, sire no., dam no., kids birth, parent detail, rationing, health etc. Many of the goat farmers visited his farm and starting goat farm of Sojati breed. Although, this goat breeding farm is not so old, but its now receiving very good response from goat rearing farmers and applauding response from all stake holders. Previously he was having 2-3 and now it is 24+2. He is also selling vermi-compost & earthworms at 10 Rs./Kg and 300 Rs./Kg, respectively. He is also cultivating fennel, cumin, mustard, moong, Bajra and nappier grass for fodder management.

Benefits

Impact factor	Before Exposure Visit and Lack of Technical Support	After Exposure Visit and Technical Support	Economic benefits from Intervention
Name of enterprise	Traditional Farming	Integrated Farming System	
Size of enterprises (Area in ha.)	2.0 ha	2.0 ha	-
Individual/Group	Individual	Individual	-
No. Of Goat	5	24+2	Annual Income 2.0 Lakh
Napier Grass (Area in ha.)	Nil	0.16	25,000 Rs/- per year
Vermicompost Unit (Vermi bed)	Nil	20	25,000 Rs/- per year
Agroforestry	Nil	Khejri:- Thar sobha Moringa PKM-1	Increase Diet Consumption & biodiversity conservation
No. of Buffalo And Cattle	2	5	60,000 Rs/- per year
Nutri gardening	Nil	Seasonal Vegetables	Increase Diet Consumption & healthy vegetables and Saving Money
Kharif Crops	Sesame, Bajra and Mungbean	Sesame, Bajra and Mungbean	80,000 Rs/- per year
Rabi Crops	Cumin, Fennel and Mustard	Cumin, Fennel, Mustard, Barley, Wheat and Chick pea	1,50,000 Rs/- per year
Variety of seed and Seed Treatment	Local seed and No Treatment	Improved Variety seed and Seed Treatment	-


Sojat Goat Farm Unit


Vermi compost Demonstration Unit


Napier Grass Fodder Production Unit

KVK-Pali-II

22. Sustainable goat farming with Sojat Goat : A Success story of Shri Nand Gopal Sonawat: Innovative Goat Rearer

Name : **Shri Nand Gopal Sonawat**
Address : Village-Chandawal, Teh.: Raipur, Dist.: Pali, Rajasthan - 306304
Mobile : 9636367728
Age : 35 Years
Land Holding : 2.5 ha

Background information about farmer field

Shri Nand Gopal Sonawat Ji was doing goat rearing with only 3 female local goats with traditional knowledge. He was not awared about proper feed management, housing management, vaccination, disease management etc. In the year, 2022, when he heard about inception of new KVK in Raipur. He participated in training programme and different extension activities of KVK. Senior Scientist & Head of KVK, Raipur motivated to him for adoption of scientific Goat farming to get additional income.

He purchased Sojat Goat buck breeder and 2 female sojat breed goat. He followed all the instruction and scientific management approaches for goat farming.

Technology Demonstrated

Conservation and promotion of Sojat Goat breed

Institutional Involvement

KVK scientist gave training and technical support and marketing strategy for scientific management for goat rearing.

Success Point

Shri Nand Gopal Sonawat Ji followed the all technical guidance as well as instructions given by KVK scientists and he did goat farming in scientific manner.

Goat Farm Details

S. No.	Goat	Before	After (Under Guidance of KVK)
1	Male Goat	1	10
2	Female Goat	2	75
3	Kids	0	35

Economic Gains

S. No.	Income	
	Selling Goats	Manure
1	Rs. 4,00,000/- per year	Rs. 1,00,000/- per year

Farmer Feedback

1. He appreciated guidance given by the KVK Scientist because of which his farm goats gained more body weight rather than the previous one.
2. He got more additional income from his goat farm unit.
3. Now he started balance ration formulation
4 He started online marketing of goats via youtube and other social media platforms.
5. Sh. Nand Gopal is now happy that he started to rear goats with the help of KVK and getting money from it without much investment.

KVK-Sikar-I

23. A Success story on Integrated Farming System

Name	:	**Narendra Singh**
Age	:	41
Phone	:	8946820794
Education	:	10th
Address	:	Villege: Bagroda, P.S. Fatehpur, District : Sikar
Land holdings	:	3.75 hectare
Livestock	:	Buffalo: 05, Goat : 08
Farming experience	:	15 Years

Introduction

Shri Narendra Singh, a dedicated and innovative farmer of the village Bagroda of Fatehpur block, Sikar district in Rajasthan. He completed his secondary schoul and chosen agriculture as profession and started devoting his time focusing on a better farming. He is having 3.75 hectare land. Though he was cultivating traditional crop like bajra, wheat and pulses in his farm regularly, he was not getting the expected income. He felt that doing agriculture through conventional method minimized the yield and income. It is also associated with low productivity, increased cost on agriculture inputs and poor or no utilization of existing farm resources available in the farm.

KVK Intervention

To overcome the problems faced by him, he started searching the new method which improves the farm productivity, soil health and income. He had visited KVK, Sikar during 2018 and has got the chance to learn about the Integrated Farming System models. From 2018 onwards, he is having close contacts with the KVK for the technical help, up gradation of new components and guidance. He has been attending lot of trainings, seminars, workshops conducted by the KVK. With the guidance of KVK, in a total of 3.75 hectare of land area, he practices Integrated Farming. He was growing field crops like mustard, barley, pulses and vegetable crops. He was also cultivating the fruit crops like ber, pomegranate and acid lime along with seasonal vegetables. He maintains a animal unit with 05 buffalo and 08 goats. He has also established a vermicompost and azolla production unit. As a progressive farmer he always tries to improve his skill and eager to know every aspects of farming from various sources, trainings, experts, department personnel etc. He eventually set a good example of improved cultivation/farming by incorporating those knowledge with his own innovation in front of other farmers. He adopted so many new technologies in farming. Shri Narendra Singh is integrating all the existing resources available in his farm completely for the economic and ecological improvements for the past 5.5 years.

Output

The adoption of integrated Farming System involving minimum use of external inputs, crop residue recycling and organic practices can improve economic issues. With this challenge, Shri Narendra Singh is integrating all the existing resources available in his farm completely for the economic and ecological improvements for the past 5.5 years. The Major outcome of Integrated Farming System found by Shri Narendra Singh is

- The Integrated Farming System increased the sustainable income from various components round the year.
- The cost of production has been drastically reduced due to reduction in external output purchase as the recycling of most of the available resources was done for the production.

Outcome

With the help of KVK, he has been promoted as one of the key trainers on IFS. He also helped in the

dissemination of technology in and around the villages. The spread of technology from farmer to farmer has gained momentum annually. He is giving training to other farmers who are really interested in setting up of IFS models in the district. His success influenced neighbouring farmers so much that many other farmers get interested and adopted the IFS models in their farm.

To recognize Shri Narendra Singh effort in the field of IFS.

Impact

About 5 IFS models have been successfully established in nearby villages after seeing its benefits and revenue by the farmers.

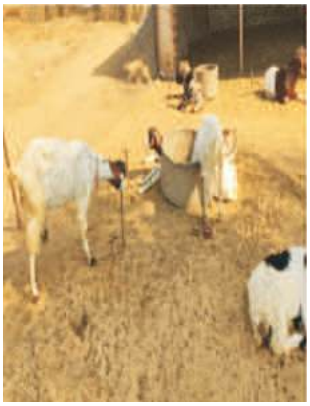
Economic performance of IFS model

S.No.	Crop	Area	Gross return	Net return
1.	Cereal crops + Oil seeds + Pulses	2.0 ha	1,95,000	95,000
2.	Vegetables	1.0 ha	2,25,000	1,50,000
3.	Animal production	-	1,25000	85000
4.	Vermi compost/Azolla	-	55000	45000
5.	Fruit Production	0.5 ha	95000	80000
Total			**6,95000**	**4,55000**


A view of field seen by farmers of village

Vegetables Production

Vegetables Production at Farmers Field




Animal Production

KVK-Tonk

24. Success Story based IFS model

Introduction

Smt. Panchi Devi Meena, a resident of Hingotia village, Block Newai of district Tonk (Rajasthan) has 1.5 ha cultivable land, She has 30 years of experience in traditional farming. Before Krishi Vigyan Kendra, Tonk intervention, she was earning Rs. 1 Lacs per year that was not sufficient to meet her family's need. After taking training from Krishi Vigyan Kendra, Tonk on Integrated Farming System model, Smt. Panchi Devi Meena has started growing vegetables (Bel Tomato), fruits (Papaya), fodder unit, vermi-composting, drip irrigation, Natural farming, Livestock and Goatary farming. Now, she is earning around Rs 2.0 lakh per year from agriculture and allied activities.

Components of IFS model in detail

1. Vegetable based farming system: Crop diversification from Cereal to vegetable made agriculture profitable for Smt Panchi Devi Meena. She started growing Bel tomato and Papaya in 0.4 ha.
2. Livestock Farming: Buffalo unit with 2 milch buffalo and Cow unit with 2 milch cow.
3. Goatary Farming: The goatary unit consists of 5 dual purpose Sirohi goats rearing as subsidiary enterprises.
4. Vermicomposting: Low cost vermicompost bed was introduced to recycle the farm waste and to prepare the vermicompost. This was in turn utilized to meet the nutrient requirement of farm and also helpful to reduce the dependence and cost on chemical fertilizers.

S.No.	Name of Components	Area (ha)	Production (Q/Lit/No.)	Gross income (Rs.)	Net income (Rs.)
1	Tomato	0.25	150	150000	80,000
2	Papaya	0.1	75	112500	81400
3	Guava	0.25	90	135000	90000
4	Wheat	0.1	5.2	11050	7850
5	Mustard	0.2	4	21800	16400
6	Fodder	0.1	55	55000	33000
7	Buffalo	2 no.	2520	100800	54000
8	Cow	2 no.	1400	56000	20000
9	Goats	5 no.	7	57500	39500
10	Drip irrigation and mulching	1.2	-	-	80 % water saving
11	Vermi-composting	1 no.	-	-	45 % chemical fertilizer saving
				Total	**4,22,150**

5. Drip irrigation was used in growing Tomato and papaya for water saving and increase input use efficiency.

6. Fodder unit has been established in 0.1 ha area for round the year green fodder availability to the livestock. Around Rs. 18000-20000/- per year were saved as feed cost per animal.

IFS model at Farmers Field

KVK-Udaipur-I

25. Nursery – A Profitable Venture

Name : **Ms Pooja Tank**

Father Name : Sh Balu Ram Tank

Address : Village :- Bedla, Tehsil :- Girwa
District :- Udaipur, State :- Rajasthan

Ms. Pooja Tank is an urban, educated youth, who has completed her graduation in Computer Science from Udaipur. Her father has 1.0 bigha land which is fully irrigated in the outskirts of Udaipur and the source of irrigation is tube-well.

KVK Interventions

After completing her studies, she started working in the nursery with her father and took 21 days training on nursery management under ARYA project in 2020. For the establishment of nursery support was done under the ARYA project and KVK staffs visited her nursery many times for technical guidance and market support.

Output

After the training she started growing flower plants i.e. Adenium, Chrysanthemum, Sun Rose, Croton, Kalanchoe etc. Started preparing the nursery. She is also procuring different varieties of adenium from different places & countries and multiplying these plants at their nursery site for further selling. She is expert in giving different shape to Adenium and also grafting to make them mixed coloured.

Outcome

She increases growing and preparing different types adenium i.e. Obesum, Rosy Adenium, Nova Tanzania, Crispum, Sawicum, Olifolium, Malitflorium, Black somilance, Crispum Haybired, Sawicum Akira and various colours i.e. (Red, Pink, Yellow, White etc.) and also mixing colours. She is selling Rs. 300-500 per Adenium and other ornamental plants per month and earned Rs. 20000-25000/- per month. Now she is earning an annual net income of rupees 280000/-. She is selling at her Nursery Unit and also to different big nurseries of Udaipur

KVK-Ambala

26. Self employment through Pig Farming

Name of the youth : **Raman Kumar**
Address : Village- Ratanhedi, Ambala
Mobile No. : 7082226793
Geo-coordinates of established unit : -30.358222° 76.927042°

Background: The Ambala district is located in the northern part of Haryana and is well-known for its agriculture, mainly sugarcane, wheat and rice. It is characterized by a fertile plain. However, significant number of marginal farmers and landless are in the district. Mr. Raman Kumar, 29 years of Ratanhedi village is matriculate. During his education, he began earning a daily wages labour in Industries. After several year daily paid labourer, he decided to pursue additional work.

Initiative: Mr. Raman Kumar contacted KVK Ambala for training on commercial pig farming in 2019. He constructed a pig farm in 1000 square feet area in Ratanhedi village. KVK scientist gave complete support during farm construction, animal buying and selection. KVK also provided 10 pure Large White Yorkshire piglets for his farm to rearing. Presently, he possess 8 sow, and two boars, as well as piglets, on his farm. He also wishes to establish an IFS model of pig-cum fish farming.

Output: Production of piglets, gilts, boars are the outputs of entrepreneur. He has been selling his produce to states of NE Region and received better prices.

Outcome: He earned a net profit of Rs. 2.35 lakhs in a year 2023. This success has been achieved in 4 years.

Impact: Improved piggery farming by Mr. Raman Kumar has been beneficial to his livelihood. He also influenced other unemployed rural youths of the adjoining areas to this profitable enterprise. His entrepreneurship is an example for locals. He has been providing employment to other poor family.

Economics of Unit (Rs.)			
Unit size	5+1	10+1	30+2
Year	2020-21	2021-22	2022-23
Running cost (Feed, Vegetable waste, Vaccine etc.)	1,83000	94,500	1,58000
Gross Income (Rs./Year)	2,61200	2,78000	3,99000
Net Income (Rs./Year)	73,200	1,83500	2,35000

CHAPTER 12

VIKSHIT BHARAT SANKALP YATRA (VBSY)

The Government of India took a massive public awareness campaign termed as Viksit Bharat Sankalp Yatra (VBSY) during 15 November, 2023 to 25 January, 2024. It has been public intensive drive to make people aware about people friendly and direct benefit transmitting flagship GOI's schemes and simultaneously monitoring their implementation along with beneficiaries' feedback. A dozen of flagship schemes were included under the VBSY. The KVKs in all the districts were assigned to create awareness about sustainable agricultural programmes. These included natural farming, organic farming, integrated farming systems, soil health cards, etc. The programs under various central ministries such as Ayushman Bharat, Ujjwala Yojana, PM Suraksha Bima, PM SVANidhi, and others were part of VBSY. Hon'ble Prime Ministers launched the VBSY on 15 November at Khunti, Jharkhand. In Rajasthan and other poll bound States viz., Madhya Pradesh, Chhattisgarh, Telangana, and Mizoram the Yatra was launched on 16 December, 2023.

A comprehensive whole-of-government approach of campaign was carried out under VBSY through extensive outreach activities reaching to all the Gram Panchayats (GPs), Nagar Panchayats and Urban Local Bodies involving Central, State and Local governments. The VBSY focused on the following specific objectives:

- Reaching to unreached by identifying those individuals who are eligible to get benefits under various Government schemes but has not been able to avail it so far. While identification was important, the more important has been the enrolments of potential beneficiaries. The VBSY offered a platform to both these groups.
- Providing information and creating awareness about the schemes, eligibility and the benefits so as to attract maximum benefits to those who need it the most.
- Interaction with beneficiaries to get their experiences and sharing these experiences, stories and insights through online specially created platform *'Meri Kahani Meri Zubani'*.

Fig. 1 ICAR-ATARI-Jodhpur officials watching live telecast of VBSY inauguration by Hon'ble Prime Minister

The Yaatra has been a great success covering about 2.50 crore citizens across 68,000 Gram Panchayats and 2 crore individuals pledging commitment. While it help creating awareness about key central schemes amongst intended beneficiaries, it also played a pivotal role in assessing the ground-level impact of these initiatives. The whole-of-government approach ensured collaboration between various stakeholders. Reaching out to every GPs in the country was aimed to address vulnerable and underserved populations who were eligible but have not availed of the benefits making it the most inclusive drive of the government to reach the poorest of the poor and disadvantaged and challenged areas. Through *'Meri Kahani Meri Zubani'* initiative, the VBSY added a human touch to the campaign and amplified success stories as well as the schemes' impact on peoples' lives.

The VBSY was undertaken through *VBSY Raths* designated for the GPs in each district. These Raths moved simultaneously under the pre-planned routs to cover several of the GPs of the district in a day.

Krishi Vigyan Kendra in VBSY

KVKs being the district level institution for farmers and farming played a very constructive role in VBSY by mobilizing and reaching out to the millions of farmers and other stakeholders across the country. The preparations for VBSY started with an interaction and preparatory meeting taken by Secretary DARE & Director General, ICAR on Nov 09, 2023 before the launch of the Vikshit Bharat Sankalp Yatra (VBSY) in which all the 731 KVKs, DDG (AE), ICAR, Directors of 11 ATARIs and DEEs of SAUs and Heads of Host Organizations of NGOs participated. The Secretary DARE & Director General, ICAR exhorted to make the VBSY a great success as a life time activity coinciding with the beginning of last quarter of centenary of India's Independence (2022-2047) termed as 'Amrit Kaal' by Hon'ble Prime Minister. Subsequently, each KVK was assigned the task to coordinate with the 'nodal officer' and the 'day nodal officers' of the district administration to deploy their SMSs' to at every VBSY *Raths* for reaching to maximum GPs. Director, ICAR-ATARI of respective zones were designated as nodal officer of the VBSY activities of KVKs for the States under their jurisdiction. The KVKs delivered lectures on nature friendly activities and programmes of GOI for the promotion of sustainable agriculture. All the 731 KVKs conducted the VBSY at different period of times between 15 November, 2023 to 25 January, 2024.

VBSY in Zone-II (Rajasthan, Haryana, Delhi) of KVKs

Director, ICAR-ATARI, Jodhpur was the nodal officer for the VBSY activities for the States of Rajasthan, Haryana and Delhi. The 66 KVKs of Rajasthan, Haryana and Delhi participated extensively in the VBSY and reached out to 5617 GPs in Rajasthan, and Haryana and 50 villages in Delhi (Delhi do not has GPs delineations). As such KVKs reached to 29.4% GPs in Rajasthan 37.6% GPs in Haryana. The total participation in the VBSY at KVKs stalls were 3271265 people including farmers and other stakeholders. One of the significant activities of the KVKs was delivering lectures on important sustainable agricultural activities like natural farming, organic farming, IFS, soil health card, etc. Total 5671 such lectures were delivered by the KVKs' scientists and technical personnel (Table 12.1). Every KVK in the three States prepared 2-3 videos of 1-2 minutes of progressive farmers narrating their success under '*Meri Kahani Meri Zubani'* drive. The KVKs also carried out a massive literacy campaign about natural farming and soil health cards through distribution of millions of pamphlets and leaflets in Hindi on these two programmes amongst farmers and other participants in GPs during the VBSY.

Table 12.1 VBSY outreach by KVKs of Rajasthan, Haryana and Delhi

State	Districts	KVKs	GPs covered	People Participation	Lecture Delivered
Rajasthan	50	47	3328	2456562	4146
Haryana	22	18	2339	801813	1481
Delhi	02	01	50*	12890	44
Total	**74**	**66**	**5667**	**3271265**	**5671**

Rajasthan

Total 47 KVKs of Rajasthan participated in the VBSY and reached to 3328 GPs with a partcipation of 2456562 farmers and other stakeholders during 16 December 2023 to 25 January, 2024. These KVKs delevered 4146 lectures on various thematic areas identified for the VBSY campaign. The VBSY was launched on 16 December, 2023. Several of the VVIPs visited KVK stalls during the Yatra. Honble Chief Minsiter of Rajasthan visited and intercated with the participants at KVK Banswara stall on 15.01.2024. (Figure 2).

Fig. 2 Hon'ble CM of Rajasthan Shri Bhajan Lal Sharma interacting with farmers and KVKs personnel at KVK-Banwara's stall during VBSY

The KVKs of various districts reached from 27 to 364 GPs in Sikar and Uaipur districts, respectively (Figure 3). Along with lectures and other activities the live demonstartions of agri-drones were also carried out by the KVKs wherein the district collectors and other officials of the district agriculture depratment participated along with farmers and KVK technical experts (Figure 4). The various KVKs also exhibited their products and value addition activities to farmers and other paricipants in the VBSY (Figure 5)

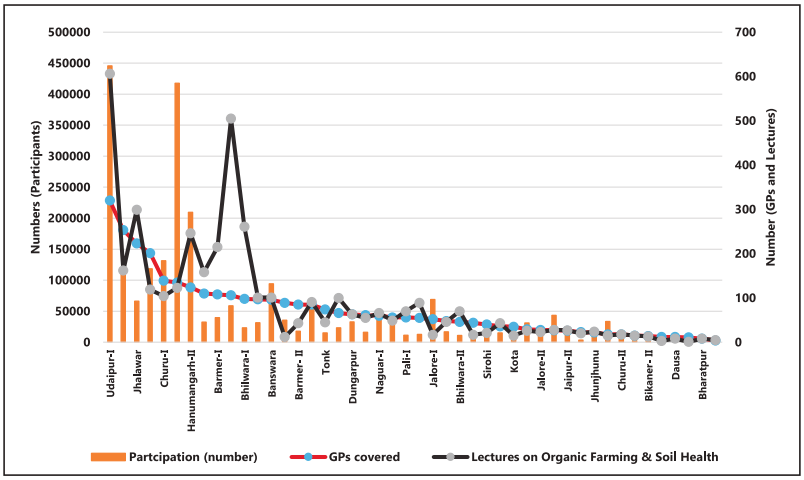


Fig. 3 Participation of KVKs in VBSY in Rajasthan

Fig. 4 District Collector Barmer at live demonstration of Agri-drone by KVK-Barmer-II during VBSY

Fig. 5 KVK- Nagaur-I displaying their products and technologies during VBSY

Haryana and Delhi

Total 19 KVKs of Haryana and Delhi participated in the VBSY and reached to 2367 GPs/villages with a partcipation of 809323 people including farmers and other stakeholders. The VBSY in these two states was carried out during 26 November, 2023 to 25 January, 2024. The KVKs also delivered 1506 lectures on various thematic areas identified for the VBSY campaign. Several of the VVIPs visited KVK stalls during the Yatra including Central and State Ministers, MLAs and other public representatives. The KVKs of various districts reached from 28 to 252 GPs in Jhajjar and Rewari districts, respectively (Figure 6). The live demonstartions of agri-drone were also carried out in Karnal and other districts along with lectures and other activities by the KVKs wherein the officals of dstrict agriculture, farmers and public leaders participated along with farmers and KVK experts. The various KVKs distributed published materials on the schemes implemented by KVKS (Figure 7).

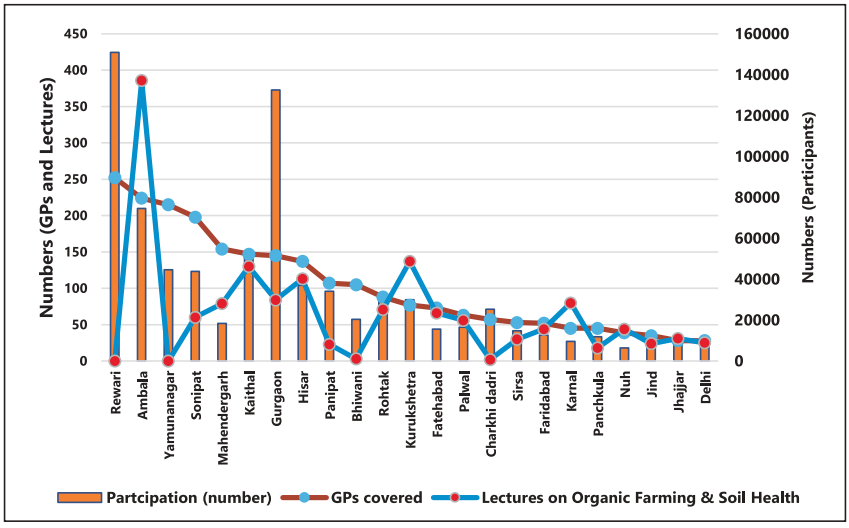


Fig. 6 VBSY in Haryana and Delhi

Fig. 7 KVKs of Haryana and Delhi participated in VBSY

CHAPTER 13

PUBLICATIONS

Research papers

Jat RA, Jain NK, Yadav RS, Reddy KK, Choudhary RR, Zala PV, Meena HN, Sarkar S, Rathore SS, Sharma GK (2023). System-Based Integrated Nutrient Management Improves Productivity, Profitability, Energy Use Efficiency and Soil Quality in Peanut-Wheat Cropping Sequence in Light Black Soils. *Sustainability*. 2023; 15(2):1361. https://doi.org/10.3390/su15021361

Meena MS, Singh, S K, Meena HN, Meena and Bishnoi R. (2023). Yield Gaps and Scaling up of Sesame Variety (RT-351) in Potential Areas of Rajasthan. *Indian Journal of Extension Education* 59(2): 55-60.

Meena, M. S., Meena, H., Meena, R., and Bishnoi, R. (2023). Enhancing tribal youth's knowledge and empowerment in goat farming: A quasi-experimental study of training impact on production and marketing: Enhancing tribal youth's knowledge and empowerment in goat farming. *Journal of Agrisearch*, 10(3), 201-206.

Gowda, M. C., Rana, R. K., Pal, P. P., Dubey, S. K., Kumar, A., Meena, M. S., Singh, R., Bordoloi, R., Bhaskaran, A., Raut, A. A., Rajesh, T., Kumar, B., and Thimmappa, K. (2023).Economic performance of enterprises promoted under ARYA and relationship with entrepreneurial competencies. *Indian Journal of Extension Education*, 59 (2), 10-15.

Bishnoi, R., Kumar, V., Bishnoi, D. K., and Meena, M. S. (2023). Economics of super seeder technique of wheat cultivation in Haryana. *International Journal of Environment and Climate Change*, 13(9), 574-582.

Bishnoi, R., Kumar, V., Meena, M. S., and Bajwan, A. (2023). Constraints faced by farmers in adoption of super seeder technique in Haryana state. *Journal of Agrisearch*, 10(2),141-144.

Nair, N. B., Jahagirdar, K. A., Angadi, J. G., and Meena, M. S. (2023). Professional competence of extension personnel in Karnataka state of India. *Indian Journal of Extension Education*, *59*(2), 79-83.

Bishnoi, R., Kumar, V., Sumit, and Meena, M. S. (2023). Resource use efficiency of super seeder technology: A comparative study in Haryana's wheat farming. *International Journal of Statistics and Applied Mathematics 8*(5): 1135-1138.

Kumar M, Singh I, Rohilla PP and Bhati NK. 2023. Effectiveness of Livestock Interventions under Farmer FIRST Programme among the Farmers of Jodhpur district in Rajasthan. *Indian Journal of Extension Education and Rural Development.* Vol 31. Pp:5-8. (NAAS rating 3.95)

Prasad JVNS, Girija V, Srinivasrao Ch, Kundu S, Ramakrishna B, Reddy K, Singh R, Murai A, Singh SK, Rohilla PP, Makkar G, Rampal VK, Grover J, Brar JS, Goyal NK, Jakhar DS, Kiran BVS, Singh VK and Bhaskar, S. 2023. Can adoption of climate resilient management practice achieve carbon neutrality in traditional green revolution states of Punjab and Haryana? Published online in Elsevier International Journal. *Journal of Environmental Management.*338 (2023).117761. https://doi.org/10.1016/j.jenvman.2023.117761. Pp: 338-355. (NAAS rating 14.91)

Books and Book Chapters

Sisodiya, M.S., Narayan, R., Mishra, J.P. and Bajiya, S. 2023. Natural farming: A potent way to green agriculture. In Green Technologies for Sustainable Agriculture. Eds. Shivani Ranjan, Sumit Sow, Parmeswar Dayal, Arun Kumar and Dhirendra Kumar Roy. Biotech Books, New Delhi. pp. 291-308

Singh VK, Prasad JVNS, G Pratibha, Pankaj PK, Subba Rao AVM, Ngasaree K, Srinivas I, Rama Rao CA, Prabhakr M, S Rajbir, Rohilla PP, Mishra JP, Chaudhari SK and Gautam US. 2023. Technology Demonstrations: Enabling communities to cope with climatic variability and to enhance adaptive capacity and resilience in agriculture. National Innovations in Climate Resilient Agriculture (NICRA) Project. Published by ICAR-Central Research Institute for Dryland Agriculture, Hyderabad. Research Highlights. Pp:1-184.

Singh VK, Prasad JVNS, Indoria AK, Kundu S, Ramana DBV, Rejani R, Prabhakar M, Rohilla PP, Singh SK, Mishra J.P., S Rajbir, Chaudhari SK and Gautam US. 2023. Promising Climate Resilient Technologies of Rajasthan. Published by ICAR-Central Research Institute for Dryland Agriculture, Hyderabad. Pp:1-104.

Yadav R.S., Kumar M., Santra P., Meena H.M. and Meena H.N. (2023). Plant Growth-Promoting Microbes: The potential phosphorus solubilizers in soil of arid agro-ecosystem. Springer, Singapore. *Plant Growth Promoting Microorganisms of Arid Region* pp. 71-92.

Scientific/Popular articles

Mishra, J P., Mandal B. and Pathak, H. 2023. ICAR-DARE steered successfully G-20 Meeting of Agricultural Chief Scientists (MACS). Indian Farming. 73(06): 03-07

Mishra, J P 2023. Reimagining Indian Agriculture: The Role of Frontline Extension. Agriculture World. 9(12): 30-32

Goyal S, Sankhla G and Rohilla PP. 2023. Impact of Cation-based mineral supplement to prevent Acidosis in dairy animals in villages of Karnal district Haryana. *Indian Farming*. 73 (10): 14-16.

Papers/Abstracts in seminar/symposium

Jangid BL, Rohilla PP, Singh SK and Mishra JP. 2023. Sustainable livelihood for tribal farmers and communities through diversified farming assets creation under tribal sub-plan. National Seminar on, "National Seminar on Evolving Extension Science Towards Secondary Agriculture for Sustainable Development" June 22-24, 2023 at University of Agriculture Sciences, Bengaluru. pp: 70-71.

Rohilla PP, Jangid, BL, Matwa, D and Mishra J P. 2023. Custom Hiring Centers: A successful institutional intervention under NICRA. National Symposium on, "Enhancing farming sectors income through integration, diversification and commercialization of technologies". 1-2 September 2023, AU Jodhpur, Rajasthan. pp: 69.

Bihari S and Rohilla PP. 2023. Study on existing housing, feeding and calf rearing management practices of dairy animals among farmers of Churu District of Rajasthan. National Symposium on, "National Symposium on, "Enhancing farming sectors income through integration, diversification and commercialization of technologies". 1-2 September 2023, AU Jodhpur, Rajasthan pp: 80.

Navab S, Rohilla PP, Kumar S, Meena KA, Meena YK and Govinda. 2023. Salicylic Acid Mitigate the Adverse Effect of Heat Stress on Yield of Wheat (*Triticum Aestivum* L). National Symposium on, National Symposium on, "Enhancing farming sectors income through integration, diversification and commercialization of technologies". 1-2 September 2023, AU Jodhpur, Rajasthan. Pp: 12.

Navab S, Rohilla PP, Kumar S, Meena KA, Meena YK and Govinda. 2023. Impact of Salt Tolerant Variety of Barley (*Hordeum Vulgare* L.) RD-2794 in Climate Resilient Agriculture. National Symposium on, National Symposium on, "Enhancing farming sectors income through integration, diversification and commercialization of technologies". 1-2 September 2023, AU Jodhpur, Rajasthan Pp:38.

Singh, N, Ramesh Kumar R, Yadav P, Shivran A, Yadav J L, Meena MS and Rohilla PP. 2023. Enhancing Income of Unemployed Youth through Adopting Mushroom Cultivation as Agri-entrepreneurship in Mahendergarh District. National Symposium on, National Symposium on, "Enhancing farming sectors income through integration, diversification and commercialization of technologies". 1-2 September 2023, AU Jodhpur, Rajasthan Pp: 65-66.

Yadav P, Kumar R, Meena MS and Rohilla PP. 2023. Empowerment of Rural Women through Processing and Marketing of Millets Value Added Products: A Case Study in Mahendergarh. National Symposium on, National Symposium on, "Enhancing farming sectors income through integration, diversification and commercialization of technologies". 1-2 September 2023, AU Jodhpur, Rajasthan Pp: 112-113.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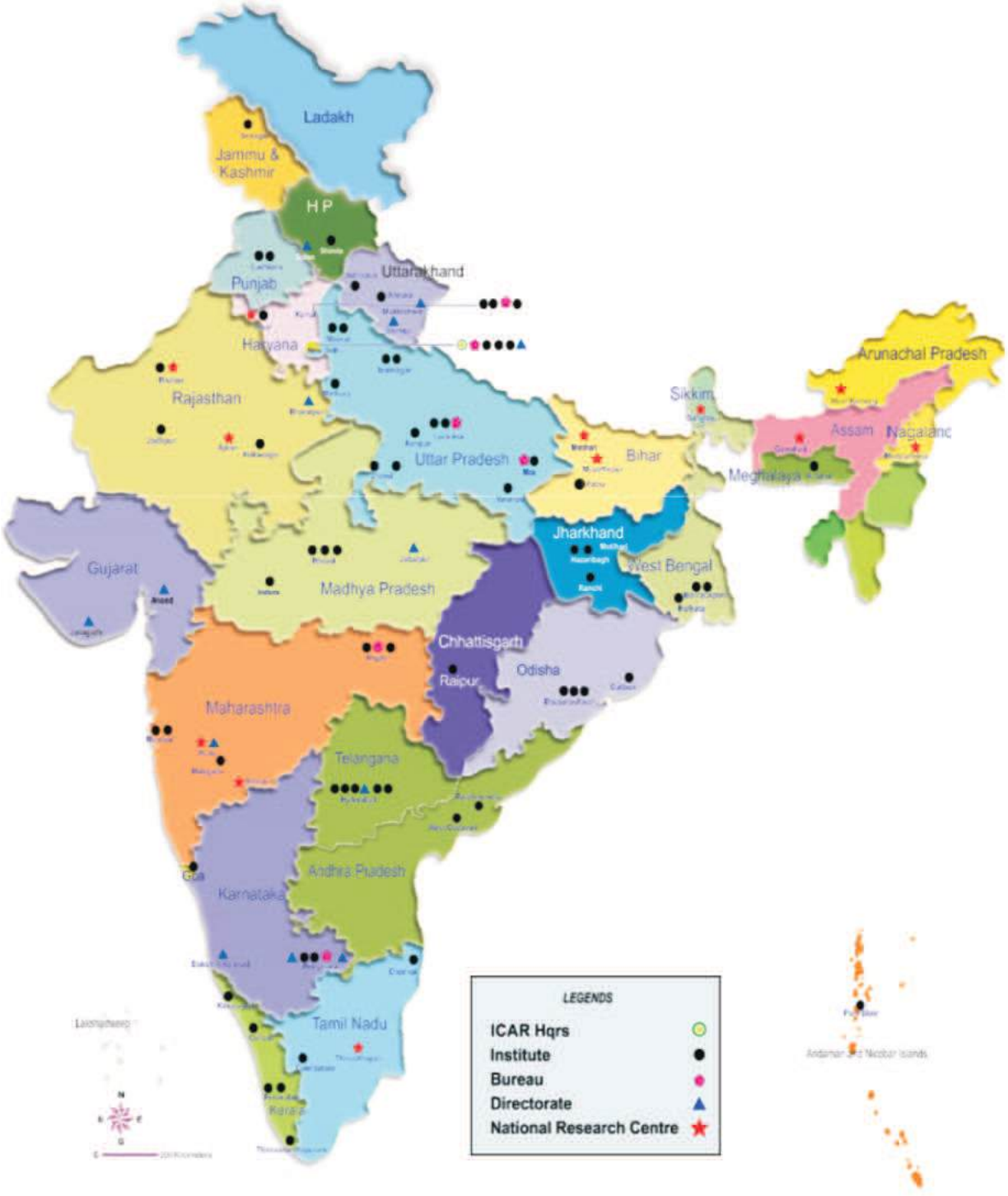

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