

Technology Assessment, Refinement and Transfer



Technology assessment, refinement and demonstration are integral functions of outreach programme of Indian Council of Agricultural Research (ICAR) through Krishi Vigyan Kendras (KVKs). The major activities of KVKs included on-farm trials (OFTs) to identify location specificity of technologies in various farming systems, frontline demonstrations (FLDs) to exhibit production potential of technologies, and training of farmers and extension personnel to update their knowledge and skills in frontier areas of technology development. In addition, the KVKs acted as knowledge and resource centres; produced technological inputs; and made climate resilient interventions for mitigating recurrent droughts, floods and disasters.

Technology assessment and refinement

Assessment: During the year, 2,651 technological interventions were assessed across 3,942 locations by laying out 21,936 trials on the farmers' fields on various crops under different thematic areas, namely cropping systems, drudgery reduction, farm machineries, integrated crop management, integrated disease management, integrated farming systems, integrated nutrient management, integrated pest management, integrated pest and disease management, organic farming technologies, processing and value-addition, resource conservation technologies, seed/planting material production, storage techniques, varietal evaluation and weed management. The major crops covered were paddy, wheat, maize, blackgram, green gram, pigeon pea, chickpea, groundnut, mustard, sesame, soybean, sugarcane, cotton, onion, tomato, brinjal, okra, amaranthus, chillies, cowpea, banana, mango, apple, turmeric, sweet potato, etc.



Assessment of Kadari-6 variety of groundnut for drought tolerance



Polythene mulch in tomato at Tumkur

Livestock related 382 technological interventions were assessed at 534 locations through 4,229 on-farm trials on animals under different thematic areas of disease management, drudgery reduction, evaluation of breed, feed and fodder management, fertility management,

nutrition management, production and management, processing and value-addition, and storage techniques. The major livestock enterprises included dairy cattle, buffaloes, sheep, goat, poultry birds, quails, pigs and fisheries.

Farm-women appropriate technological interventions (166) were assessed at 217 locations through 1,826 trials under the thematic areas, namely drudgery reduction, health and nutrition, processing and value-addition, and production and management. The major enterprises covered were vermin-compost production, sericulture, lac, mushroom, nutritional gardens, etc.

Refinement: Trials (1,879) were conducted at 306 locations to refine 271 technologies under different thematic area like cropping systems, drudgery reduction, farm machineries, integrated crop management, integrated disease management, integrated farming system, integrated nutrient management, integrated pest management, processing and value-addition, resource conservation, seed and planting material production, storage techniques, and weed management. Major crops included paddy, wheat, bajra, mustard, groundnut, pigeon pea, chickpea, sugarcane, cotton, tomato, onion, brinjal, okra, apple, chillies, etc.

Technological interventions (39) in 38 locations were refined through 387 trials on livestock, poultry and fisheries enterprises under the thematic areas, viz. disease management, feed and fodder management, nutrition management, processing and value-addition, and production and management. Dairy cattle, buffaloes, sheep, goat, poultry birds, and fisheries were the major livestock enterprises included in these trials.

In addition, 19 women specific income generation technologies were also refined by conducting 184 trials in 20 locations. The major enterprises include value-added dairy and aonla products, mushroom products, etc.

Frontline demonstrations

FLDs were conducted at the farmers' fields to demonstrate production potential of newly released crop varieties/production technologies in crops/animal husbandry/other agriculture-related enterprises. On-site training and field days for the benefit of farmers and extension workers were also organized at demonstration/sites. During this year, 92,940 FLDs were organized, out of these, 82,566 (81%) were on crops (cereals, millets, oilseeds, pulses, commercial crops, fibres, spices, medicinal, plantation, fodder, green-manure and horticultural crops) covering an area of 26,136 ha.



For promoting the hybrids, 10,374 demonstrations covering 3,527 ha were organized in cereals, millets, oilseeds, pulses, fodder, cotton and horticultural crops. For popularization of improved tools and farm implements, 5,910 demonstrations on 7,657 ha farm area; 11,133 demonstrations on livestock enterprises; and 4,113 demonstrations on other enterprises including gender-specific technologies for women empowerment were organized. Besides, 35,879 demonstrations on climate-resilient technologies were also conducted by KVKs under NICRA project.

Cereals: Demonstrations (50,699) covering 17,690 ha were conducted for rice, wheat, maize, and barley. The highest yield was recorded in wheat (101% over farmers' practice), followed maize (28%) and rice (20%). Yield of barley and wheat recorded 19% increase over farmers' practices.

Millets: Demonstrations on important millet crops like barnyard millet, finger millet, pearl millet and proso millet were conducted with 3,234 farmers with area coverage of 1,164 ha. The increase in yield was 33% over local checks.

Oilseeds: During the year, 15,099 demonstrations were conducted on oilseed crops, viz. groundnut, sesame, soybean, sunflower, *toria*, linseed, mustard, castor, niger, rapeseed, and safflower with area coverage of 5,113 ha. The yield increase ranged from 13.0% in soybean to 22.0% in castor over farmers' practices.



Demonstration on castor DCH 177 at Ramanagar

Pulses: Demonstrations on pulse crops like black gram, cowpea, field pea, green gram, horse gram, lentil, pea, pigeon pea, and *rajmash* were conducted in 24,311 farmers' fields covering 7,219 ha. The yield increase was 31.3% in black gram, 27.41% in chickpea, 19.7% in cowpea, 33.61% in field pea, 26.87% in green gram, 42.7% in horse gram, 39.8% in lentil, 26.3% in pea, 10.9% in pigeon pea, 39.8% in *rajmash* and 23.8% in rice bean as compared to farmers' practices.

Commercial crops: Under commercial crops, 1,719 demonstrations were laid out on sugarcane (335), cotton (1,217), betel leaf (32), coffee (20), tea (9) and guar seed (106) in an area of 708.6 ha. The yield advantages in demonstration plots were 20.6% in cotton, 17.6% in sugarcane, 15.6% in coffee, 39.5% in betel leaf, 14.4% in tea, and 9.14% in guar seed as compared to local checks.

Fodder crops: FLDs on fodder crops, berseem, cowpea, maize, lucerne, napier, oat, pearl millet, sorghum and sudan grass were conducted in 1,351 farmers' fields covering 252.0 ha. The increase in fodder yield varied from 19% for oat to 53.0% in napier grass as compared to the local checks.

Horticultural crops: A large number of demonstrations (26,348) were conducted on horticultural crops, viz. vegetables (12,990), fruits (4,281), flowers

Yield performance of major food and commercial crop varieties under FLD

Crop	No. of farmers	Area (ha)	Yield (q/ha)	
			Demo	Check
Food crops				
Paddy	14,883	5,449.33	42.15	35.19
Wheat	10,059	3,453.15	44.25	37.07
Maize	4,940	1,494.27	35.90	28.00
Oilseeds	15,099	5,112.47	11.60	9.11
Pulses	24,311	7,218.91	14.20	11.54
Commercial crops				
Cotton	1,863	761.48	22.52	18.92
Onion	1,561	278.05	204.80	165.80
Potato	850	176.04	268.33	221.90
Sugarcane	2,420	1,160.57	11.32	10.13

(601), spices and condiments (1,521), tuber crops (4,592), plantation crops (371) and medicinal crops (143) in 6,805 ha. The yield advantages recorded under these demonstrations were 15% in medicinal crops, 30% fruits, 23% flowers, 21.2% spices and condiments and 29% in vegetables over the farmers' practices.

Hybrids: For exploiting the potential of hybrids in farmers' fields, 10,374 demonstrations in 3,527 ha area were conducted for cereals, millets, oilseeds, pulses, fodder crops, cotton and horticultural crops. In cereals like rice, wheat, sorghum, pearl millet and maize, 5,649 FLDs were conducted by 272 KVKs covering 1,762 ha area and achieved yield increase up to 134% in maize hybrids. Demonstrations (1,195) on hybrid cotton were conducted by 33 KVKs on 538 ha wherein the yield increase of 92% was found as compared to local checks. FLDs (428) on hybrids of castor, mustard and sunflower, conducted by 94 KVKs across the country covering 177 ha, achieved yield increase as high as 64% in hybrid mustard as compared to local checks. Demonstrations (63) were conducted on napier hybrids achieving enhanced yield up to 128% as compared to local checks. Similarly, 1,859 demonstrations were conducted on vegetable and fruit crop hybrids covering an area of 552 ha through 153 KVKs achieving yield increase as high as 101% in okra hybrid as compared to local checks. The remaining 151 demonstrations on

Yield performance of hybrids in major crops

Category	No. of demonstrations	Area (ha)	Yield (q/ha)	
			Demo	Check
Cereal crops	5,649	1,762.30	45.90	42.10
Commercial crops	1,279	550.40	40.80	33.50
Fodder crops	63	14.20	748.30	460.00
Horticultural crops	1,859	551.70	241.10	209.10
Millet crops	945	411.60	19.70	15.10
Oilseed crops	428	177.60	16.60	14.20



hybrids were conducted on crops like cowpea, red gram etc.

Farm mechanization: To showcase the effective and efficient use of improved tools and implements, 5,910 demonstrations were conducted on different farm operations like planting/sowing (2,333), post-harvest and processing (5), tillage (1,038), weeding (746), plant protection (421), harvesting (716) and threshing (651).

Livestock, fisheries and other enterprises: Demonstrations (11,133) were conducted covering 6,177 dairy animals, 4,729 sheep and goat, 24,972 poultry birds, 1,779 ducks, 1,633 pigs, 140 units of rabbits, and 835 units of fisheries. Besides, FLDs were also conducted on bee keeping (128 units), lac cultivation (56 units), mushroom production (2,495 units), vermin-compost production (213 units), household food security (32 units), nutrition gardens (844 units), sericulture rearing (9 units), value-addition (242 units) and women empowerment (93 units) through economic activities which involved 4,113 farmers and farm women.

Capacity development

As many as 54,415 training programmes were organized wherein 15.27 lakh farmers/farm women, rural youths and extension personnel participated.

Farmers and farm women: Trainings (43,381) were organized on various technologies to update the knowledge and skills of 12.52 lakh farmers and farm women. The courses were on productivity enhancement of field crops (22%), horticultural crops (16%), empowerment of rural women (13%), plant protection (15%), livestock production and management (10%), soil health and fertility management (9%), farm-machinery tools and implements (5%), capacity building and group dynamics (5%), production of input at site (2%), fisheries (2%) and agroforestry (2%). These

courses (43,381) were conducted on campus (44%) as well as off-campus (56%). The participants included 3.33 lakh farm-women. Among the crop production technologies, about 27% of the training courses were on integrated crop production technologies, followed by weed management (10.1%) and seed production (8.2%). Out of 7,022 training courses on horticulture, 3,695 were on vegetable crops, 2,176 on fruit crops, 302 on spices, 321 on ornamental and 193 courses on medicinal and aromatic crops.

Rural youth: Skill-oriented training courses (7,000)

were organized for 1.68 lakh rural youth, including 61,742 young women (36%) during the year. These courses were on integrated farming, mushroom production, value addition, dairy farming, seed production,



On-campus training programme for rural youth on value-addition at Ramanagara, Karnataka

vermin-culture, nursery management of horticulture crops, bee-keeping, protected cultivation of vegetables, repair and maintenance of farm machinery implements, sheep and goat rearing, poultry production, production of organic inputs and small-scale processing.

Extension personnel: Capacity development programmes (4,034 courses) were also conducted for 1.07 lakh extension personnel, out of which 22,950 (21.47%) were women extension personnel. These courses were organized for extension functionaries working in government and non-government

Success Story

Entrepreneurial development of farm women

The Subject Matter Specialists of KVK during their field visit of village Changro (Block-Shankargarh, Dist-Balrampur-Ramanujganj) Burhanpur, Madhya Pradesh observed that Jeera phool rice growing families were selling raw rice to the traders @ ₹ 19 to 23/kg. With 67% recovery of rice they were earning ₹ 30–32/kg of scented Jeera phool rice. However, after milling and packaging of the same rice traders were selling it @ ₹ 52–55/kg. The KVK scientists motivated 15 farm women to unite themselves into a farmers interest group (FIG), *Surya Swyam Sahayata Samooh*, and helped them in submitting a proposal under Tribal Sub Plan (TSP) for necessary critical technical inputs, proper milling, packaging and branding of Jeera phool rice. The KVK also helped the FIG in getting a bag sealing machine and a mini rice mill. The group earned about ₹ 60,000 after the investment of ₹ 36,000 only, in just one season selling about 12 q of Jeera phool rice @ ₹ 250/packet of 5 kg. There is a huge demand for this organic rice from many consumers across the state and traders as well.

Success story

Krishi Prajukti Rath

KVK, Dhalai, Tripura has started an innovative extension approach by using a *Krishi Prajukti Rath* with financial support from ATMA. This innovative approach of the KVK has brought a greater level of enthusiasm and confidence amongst the farmers of the district as well as the field level functionaries of the State Agriculture Department. For increasing production and productivity of different crops during the *kharif* season, the KVK with the assistance of ICAR Research Complex (Tripura Centre), Lembucherra distributed 4,700 kg HYV (Gomati, MTU1010 and Ranjit) of paddy seeds, 2,000 kg of groundnut (var. TG-37-A) seeds, and maize seeds to the farmers of Dhalai district.



Inauguration of the *Krishi Prajukti Rath* by the Zilla Sabhadhipati (Dhalai district)

The programme was a huge success as it could ensure deliberate presence of important dignitaries like *Sabhadhipati* of Dhalai Zilla Parishad, Chairman, Panchayat Samiti, Ambassa Block, Vice Chairman, Kamalpur Nagar panchayat and senior officers of State Government.



Success Story

Mitigating cyclone in eastern and southern coastal area

Cyclone *Hud-hud* occurred in five districts of Odisha and three districts of Andhra Pradesh on 12 October 2014. This resulted in heavy crop damage due to high speed cyclone (100–130 km/h) followed by heavy to very heavy rainfall. In Odisha, the major crops affected were rice and maize; whereas in Andhra Pradesh, paddy, cotton, banana and coconut were the severely damaged crops. The Krishi Vigyan Kendras of these districts intervened through alert messages before the cyclone and remedy messages after the destructions, made diagnostic visits of the damaged crops, diffused the contingent information through telecast. In the affected districts of Odisha, KVK specialist introduced the contingents crops like sesame, groundnut, green gram, blackgram and cowpea in the place of rice and maize. Similarly, in Andhra Pradesh several technological interventions like application of booster dose of fertilizer for paddy crops, crown treatment of plantation crops and management of banana orchard with appropriate fertilizer regimes resulted in meaningful impact.

organizations who were directly or indirectly related with the development of agriculture sector. Training was imparted in frontier areas of agricultural technologies related to productivity enhancement in field crops, integrated pest management, integrated nutrient management, group dynamics and farmers' organization, management of farm animals, rejuvenation of old orchards, women and child care, livestock feed and fodder production, protected cultivation technology and ICT applications.

Sponsored training: Sponsored training courses (9,762) were conducted benefiting 3.21 lakh farmers and farmwomen, rural youth and in-service extension personnel. Most of the sponsored courses were related to on-site input production, economic empowerment of women, processing and value-addition, methods of protective cultivation, farm machinery tools and implements, fisheries management, household nutritional security, animal nutrition management, animal disease management, fisheries and drudgery reduction for women.

Extension programmes

For creating awareness among farmers about improved technologies and to provide timely advisory to farmers, KVKs organized different extension programmes. A total of 5.55 lakh extension programmes/activities in the form of advisory services, diagnostic



Sponsored training programme on ornamental fish production at Calicut, Kerala

Success Story

Jack fruit—Value-addition, branding and market linkage

KVK, Bengaluru Rural, implemented FLD on 'Preparation of Jackfruit products including branding and market linkage' among the members of two Self Help Groups of Melekote cross and Kachalli village, Doddaballapur taluk, of the district. Weighing balance, sealing machine, foil sealer, labeling and packing materials were made available to the group. The SHGs were sensitized on nutrient composition of jack fruit, cost economics, importance of hygiene and sanitation in production unit, marketing channels, Food Safety and Standards Authority of India (FSSAI) licensing and registration. The SHG members had a turnover of ₹ 75,000 in six months by selling the branded products.

and clinic services, celebration of important days, exhibitions, exposure visits, ex-trainees *sammelan*, farm science club, conveners' meet, farmers' seminar, farmers' visits to KVK, field days, film shows, group meetings, *kisan ghoshti*, *kisan melas*, lectures delivered as resource persons, *mahila mandals* conveners' meetings, method demonstrations, plant/animal health camps, scientists' visit to farmer's field, self help group meetings, soil health camps, soil test campaigns, workshops and others were organized which attracted the participation of 91.47 lakh participants of which 87.77 lakh were farmers

Entrepreneurship development through poultry farming in Shivalik Hills of Dehradun

KVK, Dehradun took an initiative for improvement of poultry farming in 12 villages of Doon Valley. Shri Sanjay Kumar of village Dharmawala started poultry farming unit with only 100 chicks in a rented poultry shed. Encouraged with the success he started increasing the number of chicks per batch. By the end of one year, he was having 500 chicks/batch and constructed a poultry shed of 2,100 m² in 2010. His family members worked at the poultry farm to cut down the labour costs, and within a year, he sold five batches of 2,000 at regular interval of 45–50 day duration which gave him an average



KVK scientists monitoring the poultry farm

income per batch of Rs 50,000. Now he is a full time poultry farmer along with his family. He is selling off 4–5 batches of 3,000 chicks annually and earning a reliable source of income. He draws net income of ₹ 2.40 lakh from poultry farming and ₹ 36,000 from dairy crop production. In a span of five years, he has increased 6–7 times income with total net annual income of ₹ 2.76 lakh. With the technical back-up support of KVK, he has also formed a SHG namely *Pantnagar Kukut Palak Samooh* for women empowerment. Seeing his success, more farmers have started backyards cum semi commercial poultry units in the nearby villages.



and 3.70 lakh extension personnel. The KVKs also organized 1.33 lakh extension programmes through TV programmes, radio talks, CDs/DVDs, extension literature, newspaper coverage, popular articles, leaflets, folders and books/booklets.

Technology products: KVKs produced large quantity of technological products like seeds and planting materials of improved varieties and hybrids, bio-products and elite species of livestock, poultry and fish which benefited 16.72 lakh farmers in the country.

Seeds: During the year, 3.44 lakh q seeds of improved varieties and hybrids of cereals, oilseeds, pulses, commercial crops, vegetables, flowers, fruits, spices, fodder, forest species, medicinal plants and fibre crops, were produced and provided to 8.29 lakh farmers.

Planting materials: In all, 203.36 lakh quality planting materials of elite species of commercial crops, vegetables, fruits, ornamental, medicinal and aromatic crops, plantation crops, spices, tuber crops, fodder and forest species were produced and provided to 1.98 lakh farmers.

Bio-products: Bio-products, namely, bio-agents, bio-pesticides, bio-fertilizers, vermin-compost, mineral mixture etc. were produced and supplied to the extent of 1.27 lakh q benefiting 6.24 lakh farmers.

Livestock, poultry and fish fingerlings: Improved breeds of cow, sheep, goat, buffalo and breeding bull were produced and supplied to 1,048 farmers. Different strains/breeds/eggs of poultry birds (chickens, quails, ducks and turkey) were provided to 15,911 farmers. Improved breeds of pigs were provided to 369 farmers. KVKs also enabled 77 farmers to establish rabbit rearing units by providing 407 rabbits. Fish fingerlings (136.80 lakh) were produced and supplied to 3,155 farmers.

Soil, water and plant analysis

A total of 3.64 lakh samples (comprising 2.93 lakh samples of soil, 0.63 lakh of water, 0.05 lakh of plant, and 0.005 lakh of manure) were analyzed related to 2.94 lakh farmers of 0.47 lakh villages.

Rainwater harvesting

A total of 352 training courses and 57 demonstrations were conducted and 1.70 lakh planting material were produced. Further, 48,149 farmers and 1,408 officials visited these units and got acquainted with the system.

Technology week

Technology week, under public-public and public-private partnership mode, was organized by KVKs benefiting 1.73 lakh farmers, farm-women, extension personnel, rural youth and members of self-help groups. The events included 6,424 extension activities such as seminars, skill demonstrations, film shows, field visits, demonstrations, exhibitions and scientist-extension personnel-farmer interactive sessions.

Kisan mobile advisory

Kisan mobile advisory (KMA) was initiated by the

Success Story

Rain water harvesting: A boon for resource poor farmer

KVK, Pali motivated and guided Shri Taju Khan, one of the residents of Patherly village in Pali district, who was growing only *kharif* crops in 30 acres of undulating land besides rearing four goats. On the motivation of KVK, Pali, he constructed a temporary rain water harvesting structure having 30 m x 20 m x 3 m dimensions at his farm. This endeavour was a big success for Mr Khan as he utilized the harvested water for *ber* plantation and raising *rabi* crops for the first time. As a result of constant motivation, he approached Government of Rajasthan and got enough grants for construction of concrete rainwater storage structure (40 m x 40 m x 3.5 m), which helped him to increase the number of *ber* plants and reap an yield of 72 tonnes and a net return of ₹ 1.38 lakh. He has also developed innovative integrated practices to increase his output such as directing overflowing rainwater into his pond, taking intercrops in *ber* orchard, fodder grass production for livestock and rearing fishes in his pond, etc. At present, he earns ₹ 2.8 lakh annually by selling his farm produce mainly *ber* (₹ 1.38 lakh), greengram (₹ 56,000), chickpea (₹ 32,000) and fishes (₹ 34,000) from rainwater harvesting pond by employing all his family members. He is becoming a role model for others in his village and nearby areas for generating on-farm employment, increasing production and ensuring food security and handsome income throughout the year by using rain water harvesting system.



Sustainable management of natural resources in Pali district—A successful intervention

ICAR during 2012–13 to provide timely and need-based information to farming community. At present, KVKs are providing this service through various service providers. Information on weather, market, various farm operations, outbreak of pests and disease incidence and their control measures are given to farmers through Short Message Service (SMS). During the year, about 3.57 lakh short text messages were sent to 16.28 lakh farmers on various aspects of agriculture, horticulture and animal husbandry, weather forecast, and pest and disease control. KVKs (193) sent 4,610 voice messages to 38,088 farmers.

Technology demonstration for harnessing pulses productivity

A National level programme on 'Technology Demonstration for Harnessing Pulses Productivity' was operated this year in 11 states in partnership with IIPR, Kanpur; Zonal Project Directorates; and 137 KVKs. The programme focused on demonstration of district specific technology modules and capacity building of KVK functionaries/representatives of line departments and participating farmers. Demonstrations (14,197) in





Success Story

Raikia bean: A profitable crop for tribal in Kandhamal

KVK, Kandhamal has trained farmers and demonstrated the benefits of seed treatment, line sowing with plant protection measures to control bacterial leaf blight, FYM and use of bio-fertilizers, bio-pesticides and INM in Raikia bean, which is widely cultivated in Kandhamal district of Odisha with an average productivity of 36 q/ha. With KVK interventions, Shri Rabindra Pradhan of village Sudhipada of G. Udayagiri block got 86% higher yield with a net profit of ₹ 61,200/acre. Raikia bean cultivation proved a remunerative enterprise for the resource poor farmers. Adoption of good practices resulted in production of high quality pod yield with BC ratio of 3.4. Sri Pradhan was awarded by the Hon'ble Governor of Odisha as a progressive farmer. He has become an inspiration for many farmers.



Raikia bean at vegetative stage



Raikia bean at harvesting stage

an area of 5,000.12 ha were held on mungbean (1,234 ha), urdbean (578 ha), pigeon pea (892 ha), chickpea (2,043 ha) and lentil (254 ha) showing productivity gains (%) 25.62, 30.77, 24.76, 29.78 and 48.66, respectively, over local check.

Demonstrations on climate resilient technologies

One hundred KVKs partnered in the project on National Initiative on Climate Resilient Agriculture (NICRA) under the sub theme-Technology Demonstrations and Dissemination for Climate Resilient Agriculture. More than 1 lakh farmers from 132 villages



Mat type nursery ready for transplantation at KVK, Kushinagar



across the country were covered. Integrated packages of available and proven technologies were demonstrated in one village in each district for adaptation and mitigation under climate variability. During 2014–15, on natural resource management 6,319 demonstrations in 3,731 ha; crop production technologies 12,521 demonstrations in 4,840 ha were carried out. About 57,423 animals/birds belonging to 24,211 farmers were attended through demonstrations related to livestock and fisheries. Capacity-building interventions benefited 34,776 farmers.

National Initiative on Fodder Technology

KVKs (90) from 8 zones of the country are implementing fodder demonstration programme in the farmers' field and seed production at KVK farm.

In *kharif* 2014, the KVKs of all the zones conducted demonstrations in 124.27 ha under technology module-I by involving 866 farmers. Under technology module II, KVKs from zones I, II, IV, V, VI and VIII carried out demonstrations in 32.16 ha and 124 farmers were involved. In technology module III, demonstrations (67) on silage making as well as preservation of green fodder were conducted by the KVKs of zones I, V and VIII in 450 ha.

Under module forage production from arable land, all the selected zones had taken NB Hybrid, cowpea, berseem, maize, sorghum, oat, barley, guinea grass; white clover and rice bean (Zone-I and III) and *bajra* (Zone-II) were also taken. Similarly, for technology module on forage production from non-arable land, all the selected zones demonstrated orchard based horti-pasture system except for Zone-I and Zone-II where tall fescue orchard grass, setaria and rai grass were taken; and Zone-VI where cenchrus and stylo, karnal grass, date palm, lucerne and aonla were demonstrated. Under the module forage utilization and processing for balance diet all the zones demonstrated the technology for hay and silage making, urea treatment of straw and use of area specific mineral mixture.

Implementation of NIFTD across the country has generated an aspiration among the KVKs as well as livestock keepers. In most of the cases, the seed/slip materials performed satisfactorily with the exception in one or two places.



Fodder crop: sorghum (MP, Chari)



Fodder crop: rice bean (Bidhan 2)

Success Story

Value-addition on fruits and vegetables—A successful farm enterprise

KVK, Puducherry took up a series of activities on promotion of value-addition on fruits and vegetables as it generates additional income, self-employment and also effective utilization of bulk farm produce during the peak season of the year. Smt D. Shanmugavadhana, a middle class housewife trained by KVK on value-addition of fruits and vegetables, has established a value-addition unit. The unit was also linked with food safety under micro enterprise in processing of fruits and vegetables. At present, the unit produces 275 litre of four types of squashes, viz. amla, guava, grape and musambi with a net profit of ₹ 15,500/month as an additional income. She has trained five unemployed youth of the same village for setting-up home scale units on processing of fruits and vegetables.



Success Story

Traditional fisherman turned sea food entrepreneur

Shri Sukumaran Moonnuthuruthil from Kodungallore, aged 50, was a traditional fisherman doing prawn fishing and selling the catch daily for his livelihood. Having gained knowledge and skill in making dried prawn and value-added products from prawn through training at KVK, Ernakulam, he established a small scale prawn processing unit. KVK team also facilitated him to get Food Safety and Standards Authority of India (FSSAI) registration and a Small Scale Industry (SSI) registration. At present, the unit is making value-added products such as ready-to-cook dried prawn, prawn chutney powder and roasted prawn and selling on a brand name. He is using raw material of fresh sea prawn from his own catch and processing about 60 kg of dried prawn per month. He earns a net income of ₹ 18,000/month. He is also hiring labour at his processing unit.

Technological backstopping

For updating the technical knowhow of the KVK staff, the Directorates of Extension (DE) of SAUs/CAU organized 284 training programmes which helped 4,325 staff of KVKs. These training programmes covered the important areas like identification of thrust areas, contingency planning, administrative and financial matters, extension methodology, OFT modulation, market intelligence, entrepreneurship development, participatory extension approaches, information and communication technology, natural resource management, impact assessment of extension programmes, integrated farming systems, high value-horticultural crops, post-harvest management of horticultural crops, pesticide residues and food safety, technologies for yield maximization in rainfed areas, protected cultivation, participatory seed production,



Field visit during training programme conducted by Directorate of Extension, UAS, Dharwad

Success Story

Kera bouquet—an innovate activity from coconut inflorescence

Kera bouquet is an innovation of KVK, Kozhikode. It is a beautiful dry flower arrangement made from coconut inflorescence. Having gained knowledge and skill on preparation of Kera bouquet at KVK, Calicut, two youngsters, Mr Binu and Mr Kannadas established a production unit of Kera bouquet at Muthukad. At present, the unit is producing several designs of Kera bouquet on orders from within the district, other districts and other states for ceremonial functions and getting a net profit of ₹ 2,500–3,000/month as it is running only on leisure time.

Case studies/Success story

Commercial vegetable nursery raising – A profitable agro-enterprise

Shri Heth Ram, a youth from village Haat-Bajaura of Kullu district, realising the fact that healthy seedlings are the pre-requisite of successful vegetable production, started the vegetable nursery under technical support of KVK. In about 200 m² area, seedlings of tomato, capsicum, cabbage and cauliflower were produced round the year under poly tunnels with raised beds. Gradually, he expanded the area to about 600 m² with a capacity of producing about 17 lakh vegetable seedlings round the year and supplying these to the commercial vegetable growers in the district. The major vegetable crops covered include tomato, capsicum, brinjal, chilli, squashes, cucumber, bitter-gourd, cabbage, cauliflower and onion. The seedlings of 10 different vegetable crops were produced with the net profit of about ₹ 3 lakh. He has become the role model in this venture in the entire district. Forty progressive farmers have adopted this vocation and established small scale nursery production units as a livelihood option.

livestock production management, scientific fish hatchery management, commercial poultry production, animal genetic resource conservation, etc.

Further, the Directorates of Extension also organized 193 workshops and meetings for effective implementation of programmes of KVKs. The officials of these directorates made 1,931 visits to the KVKs and also made 2,026 field visits to review and monitor activities at farmers' fields like, on-farm trials, frontline demonstrations, etc. These directorates provided technological products like seeds to 385 KVKs, planting materials to 217 KVKs, bio-products to 230 KVKs, livestock breeds to 72 KVKs, livestock products to 43 KVKs, poultry breeds to 93 KVKs, poultry products to 20 KVKs, fish seed to 2 KVKs, poly-houses to 14 KVKs and low cost vermi-compost technologies to 6 KVKs. Besides, the Zonal Project Directorates through their HRD programmes upgraded the knowledge and skills of 3,404 staff of KVKs by arranging 66 training programmes at various SAUs and ICAR Institutes.

Agricultural Technology Information Centres

For single window delivery of technology information, technology services and technology products to the farmers, Agricultural Technology Information Centres (ATICs), proved instrumental in attracting 6.31 lakh farmers' visit to the ATICs for the technological solutions. Technological information was provided to about 2.50 lakh farmers both through print and electronic media. Likewise, 2.98 lakh farmers got quality technological products, viz. 0.37 lakh quintals seeds, 28.15 lakh seedlings/saplings, 5.55 lakh livestock and fingerlings, 3.35 lakh poultry birds and 1251.18 quintals bio-products through ATICs. Besides, 1.19 lakh farmers were benefited by technological services like, soil and water testing, plant/animal diagnostics, seed testing, etc.

