

वार्षिक प्रतिवेदन Annual Report 2012-13



क्षेत्रीय परियोजना निदेशालय - क्षेत्र ८
भारतीय कृषि अनुसंधान परिषद
बेंगलूर - 560 024



Zonal Project Directorate - Zone VIII
Indian Council of Agricultural Research
Bangalore - 560 024



ZPD-ZONE VIII, BANGALORE



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Dr. S. Prabhu Kumar
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क्षेत्रीय परियोजना निदेशालय - क्षेत्र ८
भारतीय कृषि अनुसंधान परिषद
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PREFACE

Indian Agriculture faced stupendous challenges with severe drought conditions prevailing in Southern India during 2012-13. However *kharif* short fall to some extent compensated due to higher production achieved during *rabi* and as a result the total food production during 2012-13 touched a record level of 255.40 million tonnes. It is heartening to note that the compound annual rate of growth of food grains production, which stood at just 0.80 per cent during 2000-01 to 2005-06, accelerated to 2.90 per cent per annum during 2005-06 to 2012-13. This was possible due to hard and dedicated work from the farming community coupled with high yielding technologies from the National Agricultural Research System and coordinated efforts from the Central and State sector schemes.

Krishi Vigyan Kendras (KVKs) being the integral part of National Agricultural Research System are responsible for development and dissemination of location specific technologies at district level. At present there are 634 KVKs in the country and almost all the districts of the country have at least one KVK and some larger districts have second KVK.

Indian Council of Agricultural Research has established eight Zonal Project Directorates under the Division of Agricultural Extension; in different regions of the country to coordinate and monitor the activities of KVKs. Zonal Project Directorate Zone VIII Bangalore, coordinates and monitors the technical activities of 81 KVKs located in four states viz., Karnataka, Tamil Nadu, Kerala, Goa and two Union Territories viz., Puducherry and Lakshadweep in coordination with eight Directorates of Extension. In addition, Zonal Project Directorate also oversees the activities of the Agricultural Technology Information Centres.

At the outset, I whole-heartedly congratulate Krishi Vigyan Kendra, Calicut in Kerala for bagging the ICAR Best KVK Award 2011-12 for Zone VIII and KVK Dharmapuri in Tamil Nadu, which has done commendable contribution in Precision Farming Technologies, for receiving Mahindra Puraskar Award for 2012. In addition, I also congratulate Dr.N. Vijayakumar, Subject Matter Specialist (Agricultural Entomology) from KVK Puducherry for getting two national and two international awards for his outstanding contribution in the field of Integrated Pest Management.

This publication in the form of Annual Report depicts the salient technical achievements of the Directorate, Krishi Vigyan Kendras, technological backstopping of Directorates of Extension under SAUs, and Agricultural Technology Information Centres for the year 2012-13. In this context, I sincerely acknowledge the motivation and guidance provided by Dr.S.Ayyappan, Secretary, DARE Govt. of India and Director General, ICAR, New Delhi, Dr.K.D.Kokate, Deputy Director General (Agricultural Extension), ICAR, Dr.V.Venkatasubramanian, Assistant Director General (Agricultural Extension), ICAR and all the senior level officials from the Division of Agricultural Extension, ICAR, New Delhi for accomplishment of mandated activities of this Directorate.

I thank and acknowledge all the Vice-Chancellors and Directors of Extension from the State Agricultural Universities of Zone VIII for fully supporting the Directorate to carry out the various technical activities of this Directorate as well as KVKs. My sincere thanks to all the Directors of ICAR Institutes located in Zone VIII for providing necessary technical backstopping for the KVKs.

I extend thanks to Programme Coordinators, ATIC Managers, all the staff members of the KVKs, officials from various Development Departments and dedicated farmwomen, farmers and rural youth for their respective contributions for bringing agricultural prosperity. I further extend thanks to all staff in this Directorate for carrying out the mandated activities smoothly and effectively as well as Editorial Board for bringing out this publication in time.

I hope the data and information furnished in this publication will serve as reference for the policy and decision makers, administrators, scientists, students, corporates and all stakeholders who involved in KVK system.

Place : Bangalore
Date : July 10, 2013

A handwritten signature in blue ink, appearing to read 'S. Prabhukumar', is positioned above the printed name.

(S.PRABHU KUMAR)



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भारतीय
ICAR



Executive Summary

The Indian Council of Agricultural Research (ICAR) has established the network of Krishi Vigyan Kendras (KVKs) at district level under different host organizations viz., ICAR Institutes, State Agricultural Universities (SAUs), Non-Governmental Organizations (NGOs), Deemed Universities (DUs) and State Department of Agriculture (SDA). As on March 31, 2013, 634 KVKs were established in the country, out of which 81 KVKs are in Zone VIII. The Zonal Project Directorate-Zone VIII coordinates, plans, monitors and evaluates the technological interventions and frontline extension programmes of 81KVKs in Karnataka (31), Tamil Nadu (30), Kerala (14), Puducherry (3), Goa (2) and Lakshadweep (1).

Assessment, refinement and demonstration of technologies are carried out by the KVKs with technological backstopping from SAUs and ICAR Institutes and partnering with farmers and other stakeholders in the system. KVKs organize need-based capacity development programmes for the stakeholders and creating awareness about improved agricultural technologies through appropriate frontline extension programmes. Production and supply of quality seeds, planting materials, livestock breeds, animal products and bio-products are also being undertaken to facilitate initial uptake of technologies. Thus, KVKs are serving as knowledge and resource centres of agricultural technology to support the initiatives of public, private and voluntary sectors for improving the agricultural economy of the district. Salient achievements during the reporting year are summarized as follows:

1. Technology Assessment and Refinement

KVKs have the primary mandate as evolving and disseminating location specific technologies through Technology Assessment, Refinement and Demonstration. During the period under report, KVKs have assessed a total of 339 technologies (302 Agriculture/Horticulture, 31 Animal Husbandry and 6 Empowerment of Rural Women) through 3230 On Farm Trials (OFTs) at 467 locations. Besides, 12 technologies

were refined through 70 trials taken up in 10 locations. The salient achievements include:

- High yielding varieties of paddy viz., GV0501, KMP 105, CSR 22 performed better with an average yield of 51.00 q/ha, 45.40 q/ha, 45.40 q/ha in Chitradurga, Uttara Kannada and Mysore districts, respectively in Karnataka. ADT 43, Co 47 and Co 50 recorded higher yield of 67.50 q/ha, 44.80 q/ha and 55.68 q/ha in Thiruvavur, Thanjavur and Dharmapuri districts respectively in Tamil Nadu. Pratyaksha and Anna 4 were found to be better with an average yield of 53.00 q/ha and 36.00 q/ha in Alleppey and Kottayam districts, respectively, in Kerala.
- Groundnut variety GPBD 4 was found to be highly suitable for Belgaum and Koppal districts with 22.00 q/ha and 16.30 q/ha respectively. GPBD 5 gave maximum yield of 12.50 q/ha in Chamarajanagar district in Karnataka. GG7 and ICGV 91114 gave higher yield of 22.86 q/ha and 19.25 q/ha in Ariyalur and Vellore districts respectively in Tamil Nadu.
- In maize, application of NPK @ 100:50:25 kg/ha + 10 kg/ha Zinc Sulphate + Foliar spray of maize maxim 2.5% gave an yield of 62.50 q/ha, and 61.00 q/ha in Hassan and Chickmagalur districts, respectively whereas application of NPK, 150:75:40 kg/ha and ZnSo₄ 10 kg/ha along with foliar spray of maize maxim @ 2.5% gave an yield of 74.55 q/ha in Bangalore Rural district in Karnataka.
- In groundnut, seed treatment with rhizobium @ 2 kg/ha + sulphur oxidizing bacteria (SOB) @ 1 kg/ha + soil application of SOB @ 5 kg/ha on 45th day + gypsum @ 200 kg/ha as basal dose gave higher yield of 21.40 q/ha and 25.20 q/ha in Trichy and Dharmapuri districts, respectively. Whereas, seed treatment of SOB + rhizobium @ 1 kg/ha + pseudomonas @ 10 g/kg + trichoderma viride @

4 g/kg as well as soil application of SOB @5 kg/ha on 45 DAS during earthing up + gypsum application @400 kg/ha gave higher yield of 18.90 q/ha in Villuppuram district. Application of RDF (17:34:54 kg NPK/ha) + gypsum @ 400kg/ha (basal 200 kg & 200 kg at 45 DAS) + seed treatment of SOB + rhizobium @1 kg/ha + soil application of SOB @ 5 kg/ha on 45 DAS during earthing up gave higher yield of 22.00 q/ha in Theni, 22.30 q/ha in Thanjavur, 22.51 q/ha in Ariyalur and 10.90 q/ha under rainfed in Krishnagiri in Tamil Nadu.

- Application of FYM 20 t/ha, NPK 70:25:25 kg/ha in two splits gave high yield of 78.80 q/ha and 82.50 q/ha in bitter gourd and ridge gourd, respectively, in Dakshina Kannada district whereas application of FYM 25 t/ha + NPK 75:25:25 kg/ha in 2 splits gave higher yield of 98.80 q/ha and 99.80 q/ha in bitter gourd and ridge gourd, respectively, in Udupi district in Karnataka.
- In blackgram, application of pre-emergence herbicide pendimethalin @ 0.75 kg a.i/ha on 3 DAS + post emergence application of Imazethapyr @ 60 g a.i/ha on 15 days after emergence of weeds (2 leaf stage) gave better control of weeds and higher yield of 11.50 q/ha in Ariyalur, 10.36 q/ha in Pudukottai and 9.38 q/ha in Thiruvallur districts of Tamil Nadu.
- Spraying of fosetyl aluminium 1 g + propiconazole 1 ml/ l found to be better in control of sigatoka leaf spot in banana and gave yield of 292.00 q/ha in Salem district, 421.70 q/ha in Trichirappalli district and 300.00 q/ha in Tuticorin district of Tamil Nadu.
- Seed treatment with Imidachloprid 70WS @ 5ml/kg of seed followed by foliar spray of systemic insecticide Dimethoate @ 750ml/ha on 30 DAS besides the removal of affected plants proved to be effective for the management of Yellow Vein Mosaic in blackgram and gave yield of 6.65 q/ha in Vellore district, 11.50 q/ha in Ariyalur district and 9.65 q/ha in Pudukottai district of Tamil Nadu.
- Results on management of pseudostem weevil of banana revealed that leaf axil application of mass multiplied *Metarrhizium anisoplia* @ 100 g in

rice bran, two times at 1 month interval gave higher yield of 204.00 q/ha in Pathanamthitta whereas application of *Beauveria bassiana* 25 g/pseudo stem and placing in the ground soil @ 300 g cut stems/ha and Chlorpyrifos 2.5ml/l with adjuvant 1ml/l swabbing on the stem gave higher yield of 198 q/ha in Wynad district and spraying Neemazal (1%) on pseudo stem and leaf axil filling at monthly interval starting from fifth month onwards gave better yield of 211.50 q/ha in Calicut district of Kerala.

- Power weeder was found to be highly economical for the management of weeds in paddy and gave yield of 60.50 q/ha in Palakkad district, 61.56 q/ha in Pathanamthitta district and 57.85 q/ha in Alleppey district of Kerala, 63.55 q/ha in Karur district and 67.64 q/ha in Nagappattinam district of Tamil Nadu.
- Feeding of GRAND supplement for a month @ 20ml/cow/day was found to be effective for a consistent increase in milk yield by 500 to 700 ml/day/cow with good health of cow and gave an additional income of Rs. 180/month in 20 districts of Tamil Nadu.

2. Frontline Demonstrations

Frontline demonstrations (FLDs) were conducted by KVKs to demonstrate the production potential of newly released crop varieties, production technologies in crops, animal husbandry and other agriculture related enterprises. These demonstrations were supplemented and complemented through capacity development and field days for extension workers and farmers for dissemination of successful technologies. During the year, 11132 frontline demonstrations were organized of which more in vegetable crops (1499), followed by cereals (1307), millets (801), pulses (739), oilseeds (656), fruit crops (663), spice crops (514), plantation crops (318), commercial crops (233), fodder crops (203), flowers (182), tuber crops (110), fibre crops (79) and medicinal crops (7). Besides, a total of 1296 demonstrations were conducted on hybrids of various crops in the states of Karnataka, Tamil Nadu, Kerala, Goa, and UTs of Puducherry covering an area of 3244.46 ha. Further, it also includes 459 demonstrations



on farm implements and 564 demonstrations on special pulses in the NFSM implementing districts of Karnataka and Tamil Nadu states were organized. In the area of animal husbandry and enterprises, demonstrations included 5099 improved breeds of livestock, 107 units of fisheries and 196 other enterprises benefitting 1502 farmers during the year. Apart from this, a total of 2155 demonstrations were conducted by various KVKs of Zone-VIII on horticulture crops (1282), pulses (282), commercial crops (216), oilseeds (116), cereals (104), fodder (100) and millets (55) which are at different stages of implementation. Salient findings are as follows:

- Frontline technologies in paddy were demonstrated during the year in 414.35 ha in Karnataka, Tamil Nadu, Kerala, Puducherry and Goa covering both upland and irrigated conditions. Average yield recorded due to improved technology/variety under irrigation was 59.85 q/ha in Karnataka, 56.68 q/ha in Tamil Nadu, 43.06 q/ha in Kerala and 39.0 q/ha in Puducherry as against the state average of 27.16, 30.78, 25.47 and 25.04 q/ha, respectively. In case of wheat, 117 demonstrations conducted in Karnataka and Tamil Nadu states recorded an average yield of 32.54 q/ha in Karnataka and 29.89 q/ha in Tamil Nadu under irrigation as against the state average of 9.65 q/ha for Karnataka. Under demonstrations, average per cent increase in yield was high in bajra (34.72) followed by finger millet (25.19), paddy (23.46), wheat (23.39), sorghum (21.78), little millet (22.79) and maize (6.77). These FLDs have resulted in substantial gains to farmers and also helped to enhance the national production. These technologies, if adopted on a large scale by the farmers of these states, will further lead to substantial increase in production of cereal grains in the country.
- Among oilseed crops demonstrated, groundnut technologies performed impressively in Karnataka by recording an average yield of 18.26 q/ha as against the state average of only 8.36 q/ha. In soybean, the yield recorded under technology demonstration was 12.31 q/ha in Karnataka as compared to state average of 8.51 q/ha. These

results have clearly demonstrated the potentials of oilseed improved technologies and varieties in the states of Karnataka and Tamil Nadu. Hence, these district specific technologies demonstrated by the KVKs need to be up scaled for their adoption by the farmers through the concerned line departments under the ongoing schemes of State and Central Governments.

- The FLDs conducted during the year in the states of Karnataka, Tamil Nadu and Kerala have also demonstrated the higher yield potentials of pulses than what is being achieved by the states. The average yield achieved due to technology demonstration was 12.83 q/ha in chickpea in Karnataka as compared to state average of only 6.26 q/ha. Similarly, in pigeon pea, the yield recorded under FLDs was 12.07 q/ha in Karnataka and 10.51 q/ha in Tamil Nadu as against the state average of 5.71 q/ha and 6.29 q/ha, respectively. Hence, these district specific technologies have great potential to impress the farmers to go for pulses cultivation provided technological inputs are made available to them at right time and right quality.
- Among horticulture crops, the yield increase under demonstrations as compared to farmers practice ranged from 6.90 percent in cauliflower to 82.50 percent in bitter melon in vegetables, 33.28 percent in tapioca, 29.25 percent in potato, 22.36 percent in elephant foot yam, in fruit crops ranged from 12.85 percent in sapota to 42.19 percent in mango, in spices ranged from 12.21 percent in coriander to 51.02 percent in black pepper, in plantations ranged from 12.25 percent in tea to 52.64 percent in cashew and in flowers the range was 14.30 percent in aster to 35.86 percent in tuberose. The economic returns realized under demonstrations as indicated by BCR were higher in all horticulture crops suggesting the potentiality of these technologies for up scaling the production in the country.
- In commercial crops, the yield increase ranged from 15.66 percent in coffee to 37.08 percent in Betel vine with higher BCR as compared to local check in the respective crops. The overall increase

in cotton due to demonstration was 31.06 percent with higher BCR of 2.19 as compared to local check.

- The fodder yield increase under demonstrations ranged from 11.11 percent in mixed fodder production to 66.67 percent in stylo with higher BCR as compared to farmers practice in the respective crops.
- The hybrids have clearly out yielded local checks in all the demonstrations during the year. In cereals and millets, the per cent increase in yield was high in bajra (38.12) followed by cumbu (31.67), paddy (21.19), sorghum (23.26) and maize (16.87) were observed as compared to farmer's practices. Whereas demonstrations in oilseeds and castor hybrids recorded average yield increase of 40.39 per cent followed by sunflower hybrids with 18.05 per cent. In case of cotton, the yield increase achieved with hybrids was 23.35 per cent. Similarly among vegetable hybrids, the yield increase ranged from 3.88 per cent in cauliflower to as high as 25.56 per cent in bitter gourd. In tuber crop hybrids, cassava recorded an increase of 27.88 per cent in yield.
- Demonstrations on various production technologies of livestock, poultry, sheep & goat, piggery, poultry and fisheries were conducted. Conception rate of 95.20 per cent was recorded in local breeds through introduction of *crystoscopes* for detection of right time for AI in cows. Yield increase from 7.46 to 10.59 litres/animal/day in cross-breeds was recorded through feeding of hybrid napier with highest BCR of 2.81. Vaccination and deworming followed by feed management gave increased body weight, ranging from 12 to 45 kg per animal in sheep and goat. Upgradation of local pigs using duroc boar in piggery obtained the body weight of 70 kg/pig as compared to 50 kg/pig in the check. Athulya poultry birds in cage system recorded highest egg production of 274 eggs/bird/year as against 70 eggs/bird/year in traditional practice. Management of respiratory diseases in poultry resulted in 94 per cent survivability in swarnadhara/giriraja whereas use of oral pellet RKT vaccine found to

be effective up to 99 per cent survivability in local poultry breed. Broad breasted bronze and broad breasted large white turkey birds gave 6.75 kg/bird as compared to 3.9 kg/bird in farmers practice. Vigova super M duck performed better with 2.25 kg/bird in backyard system. Demonstration of various components of fish production technologies gave fish production ranged from 1250 to 8930 kg of fish/ha.

- Among the demonstrations organized on other enterprises such as apiary, sericulture, mushroom, value addition in crops, nutrition garden, vermi-compost for income generation, the highest BCR (6.37) was observed in mushroom cultivation and lowest BCR (1.18) in ethylene gas kit for mango ripening.
- Efficiency of labour as well as farm operations and reduction in drudgery were observed through farm mechanization with introduction of various farm implements viz., cycle weeder, hand gloves for bengalgram harvesting, solar tunnel dehydrator for drying chilli, groundnut decorticator, chaff cutter, mechanized paddy transplanter, hand operated dibbler, spiral separator, vivek rice husk stove, mini auger in high density planting in nendran banana, string standard pseudostem support, pepper thresher, furrow former, drum seeder and power weeder, pre germinated paddy seeder and cono weeder, combine harvester, mechanized puddling using power tiller for paddy cultivation, paddy transplanter, CTCRI casava harvester, turmeric boiler, mini mechanical carrot cleaning machine, post hole digger, mechanized cotton picker, mechanization in maize cultivation, improved mango harvester, improved pruning shears, combined harvester, wetland drum seeder, single man operated machine for plucking tea leaves, high volume sprayer to reduce cost of labour in tea fields and CRIDA vegetable preservator.

3. Capacity Development

KVKs organized a total of 11433 capacity development programmes for 409686 participants during the reporting period. Out of 11433 courses, 73.88 per cent were the need based courses and the rest were



sponsored and vocational courses. Salient achievements are as follows:

- Most number of courses were in the area of crop production (2706) followed by livestock production and management (1259) and horticulture (1201). Among the participants, 147366 were women (35.97 percent). Highest participation of women was in the area of livestock production and management (26998 participants) followed by crop production (21363 participants).
- Participation of SC and ST community has been emphasized in the capacity development programmes organized by the KVKs, wherein the overall share was 19.93 percent (81669 out of 409686 participants). In terms of different capacity development areas, participation of SC/ST community was highest in the area of crop production (15786 participants) followed by livestock production and management (14168 participants).
- A total of 7100 courses were organized for farmers and farmwomen wherein 167619 men and 86717 women were trained. These courses covered 17 major areas related to agriculture and allied sectors. Most number of courses were organized on crop production (1771) followed by plant protection (799) and livestock production and management (785). Maximum participation of women farmers was recorded in the area of livestock production and management (17242) followed by crop production (13338).
- A total of 845 courses were organized for rural youth. Out of a total of 28513 participants, 12406 (43.51 percent) were women. Most number of programmes for rural youth was on entrepreneurship development (162 courses and 4525 participants) and processing and value addition (117 courses and 3135 participants).
- A total of 501 courses were organized for extension functionaries with a participation of 16123 personnel. Tamil Nadu KVKs organised 301 courses whereas Karnataka KVKs organized 108 courses. Extent of participation of SC/ST and

women extension functionaries was 13.73 and 29.03 percent respectively.

- Most of the KVKs in the Zone organized sponsored programmes for the benefit of farmers, farmwomen, rural youth and extension functionaries. Out of a total of 2593 courses, Tamil Nadu KVKs organised 1097 courses, Kerala KVKs organised 730 courses and Karnataka KVKs organized 716 courses. Most common sponsoring agencies are Agriculture Department, State Department Schemes, Horticulture Department, Central Government Departments and Schemes, NABARD, Financial Institutions, Veterinary and Animal Husbandry Department, Fisheries Department, Agricultural Technology Management Agency (ATMA), Watershed Department, Sericulture Department, Nehru Yuvak Kendra, Forest Department, Agricultural Engineering Department and District Industries Centre.
- During the reporting period, 394 vocational programmes were organized by the KVKs, with the participation of 10495 participants (average of 27 participants per course). In Tamil Nadu, KVKs organized 174 courses with a participation of 5271 participants. Kerala KVKs organized 132 courses with a participation of 2878 participants. Participation of SC/ST community was 19.45 per cent and that of women was 42.16 percent. Entrepreneurship development was the leading area (91 courses) followed by processing and value addition (56 courses).

4. Frontline Extension Programmes

- KVKs organized a total of 89326 extension programmes and created awareness among 29.86 lakh farmers and 0.74 lakh extension personnel and public on various aspects of agriculture and allied sectors like varietal performance, production technologies, integrated pest and disease management, animal health and nutrition, production technologies of poultry, fisheries and human nutrition. Further, KVKs popularized relevant technologies through newspaper coverage

(2032), extension literature (3214), popular articles (664), radio talks (575), T V talks (391), exhibitions (467) and kisan melas (170).

- Technology week of 4 to 6 days duration was celebrated by 31 KVKs and created awareness among 42935 farmers and 804 officials about the latest technologies in various aspects of agriculture and its allied sectors. In addition, 147 literature materials, 26.02 quintals of high yielding varieties / hybrid seeds, 28936 planting materials, 6.92 quintals of bio-products, 1.40 quintal of bio-fertilizers, 2910 livestock and 514 fingerlings were made available to the stakeholders.
- A total of 6525 text messages, 1497 voice calls and 387 text and voice calls have been sent to farmers through Kisan Mobile Advisory (KIMA). Among these communications major share was occupied by crops (4,042) followed by awareness (1,765), weather (1,069), marketing (977), livestock (852) and other enterprises (704).
- KVK staff was regularly apprised of the latest technologies through 26 e-seminars webcasted from KVK hub, New Delhi through e-linkage involving experts covering various topics of interest to KVKs.

5. Production of Technological Inputs

- KVKs produced 5743.84 q seeds of crop varieties, 1755.84 q bio-products and 34.98 q seeds of crop hybrids worth Rs. 226.84, 82.75 and 0.66 lakh and supplied to 60587, 48847 and 69 farmers, respectively.
- KVKs produced 58.64 lakh number of planting materials of varieties, 2.86 lakh number of planting materials of hybrids and 2.09 lakh number livestock and fisheries worth Rs. 163.02, Rs.2.35 lakh and Rs.76.24 lakh and supplied to 125220, 2744 and 10786 farmers, respectively.
- KVKs produced and supplied 1755.84 q of bio products, 387680 number of *Acerophagus*, 22550 EPN, 10182 Trico cards and 7367 pheromone traps through which 0.59 lakh farmers were motivated to follow farming organically as well as to reduce the application of chemical fertilizers,

fungicides and pesticides.

6. Soil, Water and Plant Testing Analysis

- Soil, water and plant testing laboratories have been established in 67 KVKs for providing analytical services to farmers in the Zone. A total of 38093 samples of soil, water, plant, manure, lime etc received from 32660 farmers belonging to 15606 villages were analyzed and the results along with appropriate advisory have been given to those farmers.

7. Rain Water Harvesting Units

- Sixteen KVKs have established rainwater harvesting units wherein 88 capacity development programmes and 61 demonstrations were conducted for the benefit of farmers and extension functionaries. Besides, 1.57 lakh planting materials were produced by utilizing these units. Further, 10348 farmers and 590 officials visited these units and got acquainted with the rain water harvesting techniques.

8. Convergence and Linkages of KVKs

- During the period under report, KVKs were involved with 22 different organizations viz., Agriculture Department, State Government Departments and Schemes, Non- Governmental Organizations, Horticulture Department, Panchayat Raj Institutions, State Agricultural Universities, Central Government Departments and Schemes, NABARD, Financial Institutions, Veterinary and Animal Husbandry, ICAR Institutions, Mass and Print Media, Farmers Associations and Groups, Fisheries Department, Agricultural Technology Management Agency (ATMA), Watershed Department, Sericulture Department, District Collector's Office, Nehru Yuvak Kendra, Forest Department, Agricultural Engineering, District Industries Centre as a part of their linkage and collaborative activities.

9. Prosperity of Farmers through Technological Interventions

Some of the successful technologies and approaches, which brought prosperity to farmers, have



been briefly mentioned here under:

- Broiler goat rearing technology has become a flagship programme of KVK, Calicut. Video modules/technology capsule on broiler goat technology was viewed by more than 75000 visitors from more than 160 countries across the world in less than a year.
- KVK, Pathanamthitta efforts helped rural families to earn income from mushroom through formation of *Edanadu Mushroom Growers Association* for producing spawn as well as mushroom. Mushroom production in the district was enhanced by 2000 kg/month, spawn production by 750 pkts/month and employment man days by 750/month.
- Introduction of pedal pumps by KVK Wayanad has significantly addressed the climate resilience for paddy cultivation in the district. As a result, 10 NGOs of the district helped the KVK to cover 25 acres in this system through capacity development to Tribal women labourers and brought more areas in summer fallows under rice cultivation.
- Introduction of Sustainable Sugarcane Initiatives (SSI) among the sugarcane growers by the KVK, Salem motivated to establish more than 20 SSI nurseries in and around Salem district for supplying the key inputs namely single budded seedlings. As a result, the SSI area has increased from 10 to 25 per cent in Salem district during the past 4 years.
- Introduction of machine harvesting of tea by KVK, The Nilgiris has gained momentum among tea growers. Mr.M.Munuswamy has refined it further and harvesting 350 kg per hour, as compared to 200kg per hour before refinement which enhanced output of the machine by 2100 kg/six hours and increased the output of the machine by 900kg/day.
- The efforts of KVK, Bangalore Rural are instrumental for the development of Biofuel Growers' Market Network in the district and as a result established a Rural Biofuel Processing Unit with an oil expelling machine at Hadonahalli, Doddaballapura taluk of Bangalore Rural district

with one ton capacity per day. At present the turnover of the unit is Rs 20.73 lakh with a net profit of Rs.2.68 lakh benefiting all members as well as creating an employment opportunity for over 200 rural families.

- Productivity of sericulture was enhanced through cluster approach implemented by KVK, Chickballapur with the support of RKVY wherein 60 sericulturists were formed as sangha. They started rearing bivoltine hybrids and obtaining average cocoon yield of 64.4 kg/100 DFLs and the total cocoon production in 10 months time was about 25000 kg. With an average price of Rs.230/kg, approximate returns were to the extent of Rs.5750000. The bivoltine cocoon productivity was 20 per cent higher than the mean yield of the taluk for the corresponding period.

10. Awards and Recognition

- KVK Calicut, Kerala has bagged the Best Zonal KVK Award of Indian Council of Agricultural Research for the year 2011.
- KVK, Dhramapuri, Tamil Nadu has bagged the Krishi Shiksha Samman Award for 2012 instituted by Mahindra and Mahindra Limited.
- Dr. N. Vijayakumar, Subject Matter Specialist (Entomology) in KVK Pondicherry received national and international awards for his contribution in the field of Integrated Pest Management.

11. Agricultural Technology Information Centres (ATICs)

- The ATICs have provided technology services to 10314 farmers, supplied 151549.60 q seeds, 57940 numbers of planting materials and 111.65 q bio-products to different stakeholders and provided information support through replies of 2871 letters received from farmers and answered 6364 telephonic calls to help farmers to clarify their doubts.
- Further, a total of 12254 books and technical bulletins were made available for farmers at ATICs followed by 490 CDs, technology inventory, video films and audio CDs benefitting 12527

farmers.

- ATICs also trained 4598 farmers and showed 1427 video shows to convince farmers on latest technologies.
- Through these services, the ATICs have earned revenue of Rs.96.85 lakh.

12. Technological Backstopping by Directorates of Extension

- Directorates of Extension organized 40 capacity development programmes and trained 387 KVK staff in the Zone. Besides, Directorates organized 30 workshops/ meetings/seminars with the participation of 587 staff of KVKs.
- During the reporting year, a total of 155.90 quintals of seeds were mobilized/facilitated by Directorates of Extension to 42 KVKs. In addition, 2.06 lakh of planting materials, 15.45 quintals of bio-products, 89 livestock, 6 quintals of livestock products, 37662 poultry birds, 2.60 quintals of poultry products, 21 piglets, 17500 fingerlings and 2.86 quintals of nutrient mixture were provided to KVKs as technology backstopping to carry out various activities timely and effectively.
- Directors of Extension and their officials have participated in 58 Scientific Advisory Committee meetings, 63 field days, 49 capacity development programmes and 12 technology weeks. In addition, they also visited 81 fields of OFTs, 102 fields of FLDs, 63 capacity development programmes, 77 extension activities and 23 Farmers Field Schools.

13. Special Programmes

- During the period under report, a total of 564 demonstrations on major pulse crops such as black gram, green gram, pigeon pea, field bean and bengal gram covering an area of 229.20 ha were conducted in the pulse growing NFSM implementing districts of Karnataka and Tamil Nadu states under technology demonstration for harnessing pulse production. Out of which, 306 demonstrations were implemented during kharif 2012 and 258 demonstrations during rabi

2012 in an area of 130.8 ha and 98.40 ha, respectively.

- Under National Initiative on Climate Resilient Agriculture (NICRA), 714.01 ha area has been treated with NRM related interventions covering 888 farmers in 9 villages. Under crop production, technology demonstrations were carried out in an area of 261.16 ha involving 1264 farmers. Under livestock and fisheries, 9 KVKs have introduced 6516 number of improved breeds of animals with vaccination, deworming, nutrition, disease management, insurance, breed upgradation, 205 poultry birds, 154 units of fodder storage, housing for poultry, improved breeds of poultry for higher egg production, integrated fish and duck farming and improved shelter for livestock and 16.05 ha improved fodder cultivation in the community lands of selected villages during drought period benefiting 1131 farmers. In addition, 106.64 ha area was developed as seed bank, 28.70 ha as fodder bank to meet the drought related situations. Nineteen commodity groups were formed in the villages for better coordination in technology adoption and custom hiring centres were established to facilitate adoption of farm mechanization. Further, 2808 farmers were trained to carryout timely farm operations besides reducing the cost of cultivation. The KVKs have provided climate literacy through village level weather station to 298 farmers on weather aspects, and organized 320 extension programmes wherein 3109 farmers participated and benefitted.

14. Activities at the Zonal Project Directorate

- First floor of the administrative building of Zonal Project Directorate was inaugurated by the Secretary, DARE, Government of India and Director General, ICAR on 25 January, 2013. On the occasion, agricultural exhibition was organized by eight award winning KVKs of the Zone VIII viz., Raichur, Cuddalore, Erode, North Goa, Calicut, Kancheepuram, Kannur and Mysore.
- Eight Expert Systems on Agriculture and Animal Husbandry Enterprises comprising paddy, ragi,



coconut, banana, sugarcane, cattle & buffalo, sheep & goat and poultry were developed and these were launched by Secretary, DARE, Government of India and Director General, ICAR on 25 January, 2013. Further, DVDs were released on these eight expert systems in English, Tamil, Kannada and Malayalam languages.

- KVK-Industry Interface workshop was organized with the participation of M/s Jain Irrigation, VST Tillers Tractors Ltd, BCRL PCI, EMAAR and Pelican Equipments on 25 January, 2013 wherein Deputy Director General (Agricultural Extension), ICAR, Vice Chancellors of SAUs, Directors of ICAR Institutes, DEs of SAUs, ZPD from Zone V, PCs of KVKs, and Scientists from ZPD Zone VIII participated and interacted.
- Zonal Project Directorate-Zone VIII organized orientation programmes on Technology Assessment, Refinement and Demonstration and trained 24 newly recruited KVK staff. Further, organised capacity development programme on administrative and accounting procedures wherein

21 administrative staff of KVKs were imparted knowledge and skills about various administrative and accounting procedures. Besides, capacity development programme on Participatory Impact Monitoring and Assessment (PIMA) was organized for the benefit of KVK staff during the period under report.

- This Directorate deputed a total of 569 KVK staff consisting of 60 Programme Coordinators, 491 Subject Matter Specialists, 10 Programme Assistants and 8 Administrative Staff to under go HRD programmes on various aspects of agriculture and allied sectors and also administrative and accounting procedures organized by various organizations in the country.
- A total of 19 publications were published, 13 meetings/workshops were organized and Zonal Project Director and staff of Directorate have participated in 61 meetings/workshops conferences/seminars, 82 SAC meetings and 31 technology weeks during the period under report.

कार्यकारी सारांश

भारतीय वृषि अनुसंधान परिषद (आईसीएआर) ने भा.कृ.अनु.प.संस्थान, राज्य कृषि विश्वविद्यालय (एसएयु), गैर-सरकारी संगठन (एनजीओ), स्वशासी विश्वविद्यालय (डीयु) और राज्य कृषि विभाग (एसडीए) जैसे विभिन्न मेजबान संस्थाओं के अधीनजिला स्तर पर कृषि विज्ञान केन्द्र का नेटवर्क स्थापित किया है। मार्च 31, 2013 तक देश में 634 कृषि विज्ञान केन्द्रों की स्थापना की गई है, जिनमें से 81 कृषि विज्ञान केन्द्र क्षेत्र-8 के अधीन है। क्षेत्रिय परियोजना निदेशालय-क्षेत्र 8 कर्नाटक के 31, तमिलनाडू के 30, केरल के 14, पुदुच्चेरी के 3 गोवा के 2, और लक्षद्वीप के 1 कृषि विज्ञान केन्द्रों का समन्वय करता है, इनके लिए योजनाएँ बनाता है और इनके तकनीकी एवं विस्तार गतिविधियों का संवीक्षा और मूल्यांकन करता है।

कृषि विज्ञान केन्द्र राज्य कृषि विश्वविद्यालयों और भा.कृ.अनु.प. संस्थानों के प्रौद्योगिकियों का सहारा लेकर एवं किसानों और अन्य साझेदारों को सहभागी बनाकर प्रौद्योगिकियों का मूल्यांकन, परिष्करण और प्रदर्शन का कार्य करते हैं। कृषि विज्ञान केन्द्र साझेदारों की क्षमता को बढ़ाने के लिए आवश्यकता - आधारित प्रशिक्षण कार्यक्रम आयोजित करते हैं और उचित विस्तार गतिविधियों के माध्यम से उन्नत प्रौद्योगिकियों के बारे में जागरूकता पैदा करते हैं। प्रौद्योगिकियों के बारे में प्रारंभिक समझ के लिए गुणवत्तायुक्त बीजों, रोपण सामग्रियों, पशु-धन नस्लों, पशु-उत्पादों, जैविक उत्पादों के उत्पादन और वितरण का कार्य भी करते हैं। कृषि विज्ञान केन्द्र संबंधित जिलों की कृषि - अर्थव्यवस्था को सुधारने के लिए सरकारी, निजी और स्वैच्छिक संगठनों द्वारा ली जा रही पहल की मदद करने के लिए कृषि - प्रौद्योगिकी के जानकारी एवं कुशलता केन्द्र के रूप में कार्य करते हैं।

रिपोर्टाधीन वर्ष के दौरान विशिष्ट उपलब्धियाँ नीचे सारांशित हैं।

1. प्रौद्योगिकी का मूल्यांकन एवं परिष्करण

कृषि विज्ञान केन्द्रों का पाथमिक अधिदेश प्रौद्योगिकी मूल्यांकन, परिष्करण एवं प्रदर्शन के द्वारा स्थान विशिष्ट प्रौद्योगिकियों का विकास तथा पसरण हैं। रिपोर्टाधीन अवधि के दौरान, कृषि विज्ञान केन्द्र ने 467 स्थानों पर 3230 चालू क्षेत्र प्रयोगों (ओएफटी) के द्वारा कुल 339 प्रौद्योगिकियों (302 कृषि / बागवानी, 31 पशु पालन एवं 6 ग्रामीण महिला सशक्तीकरण) का मूल्यांकन तथा दस स्थानों में 70 परीक्षणों के द्वारा 12 प्रौद्योगिकियों का परिष्करण किया। विशिष्ट उपलब्धियों में शामिल

हैं:

- धान की उच्च पैदावार किस्मों ने, यथा जीवी 0501, केएमपी, 105, सीएसआर 22, कर्नाटक के क्रमशः चित्रदुर्गा, उत्तर कर्नाटक एवं मैसूर जिलों में 51.00 किं. / हेक्ट, 45.40 किं. / हेक्ट के औसत पैदावार के साथ बेहतर निष्पादन दिखाया जबकि तमिलनाडू के तिरुवारूर, तंजावूर और धर्मपूर जिलों में क्रमशः एडीटी 43, सीओ 47 और सीओ 50 ने 67.50 किं. / हेक्ट, 44.80 किं. / हेक्ट एवं 55.68 किं. / हेक्ट का उच्चतर पैदावार दर्ज किया और केरल के अल्लेप्पि एवं कोट्टायम जिलों में प्रत्यक्षा तथा अण्णा 4 ने क्रमशः 53.00 किं. / हेक्ट और 36.00 किं. / हेक्ट का औसत पैदावार दिखाया।
- मूँगफली की किस्म जीपीबीडी 4 बेलगाम तथा कोप्पल जिलों के लिए क्रमशः 22.00 किं. / हेक्ट और 16.30 किं. / हेक्ट के साथ अति समीचीन पाई गई जबकि जीपीबीडी 5 ने कर्नाटक के चामराजनगर जिले के लिए 12.50 किं. / हेक्ट का अधिकतम पैदावार दी जबकि जीजी 7 तथा जीजी 791114 ने तमिलनाडू में अरियालूर और बेल्लूल जिलों में क्रमशः 22.86 किं. / हेक्ट और 19.25 किं. / हेक्ट की फसल दी।
- हासन और चिक्कमगलूर जिलों में मकई फसल पर 100:50:25 किग्रा/हेक्ट की दर पर एनपीके + 10 किग्रा/हेक्ट जिंक सल्फेट + मक्का 2.5% की फोलियार फुहार के प्रयोग ने क्रमशः 62:50 किं. / हेक्ट और 61.00 किं. / हेक्ट की उपज दी, जबकि एनपीके, 150:75:40 किग्रा/हेक्ट और जिंकसल्फेट 10 किग्रा/हेक्ट व साथ ही मक्का मैक्सिम 2.5% की फोलियार फुहार के प्रयोग ने कर्नाटक में बेंगलूर ग्रामीण क्षेत्र में 74.55 किं. / हेक्ट की उपज दी।
- तिरुचिनापल्लि तथा धर्मपूर जिलों में मूँगफली के मामले में, 2 किग्रा/हेक्ट की दर पर राईजोबियम + 1 किग्रा/हेक्ट की दर पर सल्फर आक्सीकारक जीवाणु (एसओबी) + 45वें दिन पर 5 किग्रा/हेक्ट की दर पर एसओरी का मृदा प्रयोग आधार मिश्रण के तौर पर + 200 किग्रा/हेक्ट की दर पर जिप्सम के बीजोपचार ने 21.40 किग्रा/हेक्ट तथा 25.20 किग्रा/हेक्ट



की उच्चतर उपज दी। जबकि एसओबी का बीजोपचार + 1 किग्रा/हेक्ट की दर पर राईजोबियम + 10 किं. / हेक्ट की उच्चतर उपज दी। जबकि एसओबी का बीजोपचार + 1 किग्रा/हेक्ट की दर पर रिजियोबियम + 10 ग्रा/किग्रा की दर पर एसओबी का मृदा अनुप्रयोग + 400 किग्रा/हेक्ट की दर पर जिप्सम अनुप्रयोग ने विल्लुप्पुरम जिले में 18.90 किं. / हेक्ट की उच्चतर उपज दी। आरडीएफ (17:34:54) किग्रा एनपीके / हेक्ट) का अनुप्रयोग + 400 किग्रा / हेक्ट की दर पर जिप्सम + एसओबी का बीजोपचार + 1 किग्रा/हेक्ट की दर पर रिजियोबियम + मृदा खुदाई के समय पर 45 दिनों पर 5 किग्रा / हेक्ट की दर पर एसओबी के मृदा अनुप्रयोग ने थेनी में 22.00 किं./हेक्ट, तंजावूर में 22.30 किं./हेक्ट, अरियालूर में 22.51 किं./हेक्ट और तमिलनाडु के कृष्णगिरि जिलों में वर्षासंपोषित क्षेत्रों में 10.90 किं./हेक्ट की उच्चतर उपज दी।

- दक्षिण कन्नड जिले में एफवाईएम 20 ट/हड़कट, दो भागों में एनपीके 70:25:25 किग्रा/हेक्ट से क्रमशः करेला और रिजगॉर्ड का 78.80 किं./हेक्ट तथा 82.50 किं./हेक्ट की उच्च उपज प्राप्त हुई जबकि कर्नाटक के उडुपि जिले में एफवाईएम 25 ट/हेक्ट, दो भागों में एनपीके 75:25:25 किग्रा/हेक्ट से क्रमशः करेला और तोरी का 98.80 किं./हेक्ट तथा 99.80 किं./हेक्ट की उच्चतर उपज प्राप्त हुई।
- काले चने में, 3डीएस पर 0.75 किग्राएआई/हेक्ट की दर पर अंकुरण पूर्व सस्य कीटनाशक पेंडिमीथालीन का अनुप्रयोग + अपतृणों (2 पत्ते अवस्था में) के निकलने के बाद 15 दिनों पर 60 ग्राएआई/हेक्ट की दर पर उमाज़थप्रि के प्रयोग से अपतृणों पर बेहतर नियंत्रण तथा तमिलनाडु के अरियालूर में 11.50 किं./हेक्ट, पुदुकोट्टै में 10.36 किं./हेक्ट तथा तिरुवल्लूर जिलों में 9.38 किं./हेक्ट की उच्चतर उपज प्राप्त हुई।
- फासिटिल एल्युमिनियम 1 ग्रा प्रापिकोनज़ोल 1मिली/ली के फुहरान से केले में सिगटका पत्ता धब्ब पर बेहतर नियंत्रण देखा गया तथा सेलम जिले में 292.00 किं./हेक्ट, त्रिचिरापल्लि में 421.70 किं./हेक्ट तथा टुटिकोरिन जिले में 300.00 किं. / हेक्ट की उपज प्राप्त हुई।
- काले चने में बीज के 5 मिली/किग्रा की दर पर इमिडक्लोप्रिड 70 डब्ल्यूएस से बीजोपचार व तदनंतर 30 डीएस पर 750 मिली / हेक्ट की दर पर सर्वांगी कीटनाशक डाईमीथेट का

पर्णीय फुहरान और साथ ही प्रभावित पौधों का निष्कासन, पीला धारी मोज़ाइक के प्रबंधन में प्रभावी सबित हुए व तमिलनाडु के बेल्लूर जिले में 6.65 किं./ हेक्ट अरियालूर जिले में 11.50 किं./ हेक्ट तथा पुदुकोट्टै जिले में 9.65 किं./ हेक्ट की उपज प्राप्त हुई।

- केले के आभासी डंडल घुण के प्रबंधन के परिणामों से स्पष्ट होता है कि 1 माह के अंतराल पर दो बार चावल भूसी में 100 ग्रा की दर पर बहु प्रवर्धित मेटारहिजियम अनुसोप्लिया को पर्ष अक्ष पर छिड़काव से पट्टणमथिट्टा में 204.00 किं./ हेक्ट की उच्चतर उपज प्राप्त हुई, जबकि वायनड जिमे में ब्युवेरिया बेस्सियाना 25 ग्रा/आभासी डंडल पर छिड़काव तथा 300 ग्रां कर्तत डंडल/हेक्ट की दर पर भूमृदा में रखने और डंडल पर क्लोरोपरिपास 2.5 मिली/लीसहौषध 1 मिली/ली के लगाने से 198 किं./हेक्ट की उच्चतर उपज एवं पाँचवें महीने से लेकर आभासी डंडल तथा पर्ण अक्ष पर नीमाज़ल छिड़काने से केरल के कालीकट जेले में 211.50 किं./ हेक्ट की बेहतर उपज प्राप्त हुई।
- धान में अपतृणों के प्रबंधन में पॉवर वीडर अत्यधिक किफायती सिद्ध हुआ तथा केरल के पालक्काड जिले में 60.50 किं./ हेक्ट, पट्टनामथिट्टा जिले में 61.56 किं./ हेक्ट तथा अल्लेप्पि जिले में 57.85 किं./ हेक्ट, व तमिल नाडु के करूर जिले में 63.55 किं./ हेक्ट एवं नागपट्टिणम जिले में 67.64 किं./ हेक्ट की उपज दी।
- 20 मिली/गाय/दिन की दर पर एक महीने के लिए ग्राण्ड सप्लिमेंटों के देने से गाय के उत्तम स्वास्थ्य के साथ साथ दूध के उत्पादन 500 से 700 मिली / दिन/गाय की सतत बढोत्तरी में प्रभावी पाया गया जिससे तमिल नाडु के 20 जिलों में रु.180/ माहा की अतिरिक्त आय प्राप्त हुई।

2. अग्रक्षेत्र प्रदर्शन

फसलों की नई विमोचित किस्मों की उत्पादन - क्षमता, फसलों एवं पशु-पालन की उत्पादन प्रौद्योगिकी एवं कृषि संबंधी अन्य उद्यमों के प्रदर्शन के लिए कृषि विज्ञान केन्द्रों ने फ्रण्टलाइन प्रदर्शन संचालित किए गए। इन प्रदर्शनों के साथ में सफल प्रौद्योगिकियों के प्रचार-प्रसार के लिए किसानों एवं विस्तार कार्यकर्ताओं के लिए प्रशिक्षण एवं प्रक्षेत्र दिवस आयोजित किए गए। इस अवधि के दौरान 11132 फ्रण्टलाइन प्रदर्शन आयोजित किए गए, जिनमें से साग सब्जी फसलों पर अधिक (1499), तत्पश्चात्, अनाज (1307), बाजरा (801),

दाल (739), तिलहन (656), फूल (182), कंदिल फसल (110), फाइबर फसल (79) तथा चिकित्सीय फसल (7). इनके अलावा, कर्नाटक, तमिल नाडु, केरल, गोवा, तथा पुदुच्चेरि के संघ राज्यों में 3268.46 हेक्टरों के क्षेत्र में व्याप्त विभिन्न फसलों के संकरों पर कुल 1415 प्रदर्शन आयोजित किए गए. इनके अलावा, कर्नाटक तथा तमिल नाडु राज्यों के एनएफएसएम क्रियान्वयन जिलों में 564 विशेष दाल प्रदर्शन आयोजित किए 3244.46 गए। पशुबारन तथा उद्यम के क्षेत्र में प्रदर्शनों में शामिल थे, पशुधन की 5099 उन्नत जातिजाँ, मत्स्यकी की 107 इकाइयाँ और 196 लघुउद्यम जिनसे वर्ष के दौरान 1502 किसान लाभान्वित हुए। इसके अलावा, बागबानी फसल (1282), दाल (282), वाणिज्यिक फसल (216), तिलहनबीज (116), अनाज (104), चारा (100) तथा बाजरा (55) जो क्रियान्वयन की विभिन्न चरणों पर हैं। महत्वपूर्ण विशिष्टताएँ निम्नानुसार हैं।

- कर्नाटक, तमिलनाडू, केरल, पुदुच्चेरी और गोवा में वर्षा-आधारित एवं सिंचाई दोनों के अधीन 414.35 हेक्टेयर में धान पर फ्रण्टलाइन प्रदर्शन संचालित किए गए। उन्नत प्रौद्योगिकी / किस्म के कारण कर्नाटक, तमिलनाडु, केरल तथा पुदुच्चेरी में क्रमशः 27.16, 30.78, 25.47 तथा 25.04 किं./हे. के राज्य औसत की तुलना में, कर्नाटक में 59.85 किं./हे. तमिलनाडू में 56.68 किं./हे. केरल में 43.06 किं./हे. और पुदुच्चेरी में 39.0 किं./हे. की औसत पैदावार प्राप्त हुई। गेहूँ में कर्नाटक और तमिलनाडू में 117 प्रदर्शन संचालित किए गए और कर्नाटक में 9.65 किं./हे. के राज्य औसत की तुलना में कर्नाटक में 32.54 किं./हे. और तमिलनाडू में 29.89 किं./हे. की औसत पैदावार प्राप्त हुई। प्रदर्शनों में, औसत पैदावार बढ़ोत्तरी बाजरा में (34.72) अधिक थी, जिसके बाद रागी (25.19), चावल (23.46), गेहूँ (23.39), सोरघम (21.78), छोटे कुंकनी (22.79) तथा मकई (6.77) थी। इन एफएलडी के कारण किसानों को काफी लाभ हुआ है एवं राष्ट्रीय उत्पादन को बढ़ाने में भी मदद मिली है। प्रदर्शित प्रौद्योगिकियों को अगर इन राज्यों के किसान बड़े पैमाने पर अपनाएँ तो संबंधित राज्यों में अनाज के उत्पादन में पर्याप्त बढ़ोत्तरी होगी।
- प्रदर्शित तिलहनी फसलों के तहत कर्नाटक में मूँगफली तकनीकी को प्रभावी रूप से अपनाया गया जिससे पैदावार 8.36 किं./हे. के राज्य औसत की तुलना में 18.26 किं./हे. बढ़ी। सोयाबीन में तकनीकी प्रदर्शन के तहत पैदावार 8.51 किं./हे. के राज्य औसत की तुलना में 12.31 किं./हे. थी. इन

प्रणामों ने स्पष्ट रूप से कर्नाटक तथा तमिलनाडु के राज्यों में तिलहनी फसलों की सुधरी प्रौद्योगिकियों एवं किस्मों की संभाव्यता को दर्शाया है। कृषि विज्ञान केन्द्र द्वारा प्रदर्शित इन जिला-विशेष प्रौद्योगिकियों को किसानों द्वारा अपनाए जाने के लिए राज्य एवं केन्द्र सरकार की वर्तमान योजनाओं के अधीन अद्यतन किया जाना चाहिए।

- इस वर्ष कर्नाटक, तमिलनाडु तथा केरल राज्यों में संचालित एफएलडी ने राज्यों द्वारा प्राप्त दलहनी फसलों की पैदावार की अपेक्षा उच्चतर पैदावार क्षमता को स्पष्ट किया है। काबुली चने में तकनीकी प्रदर्शन के कारण प्राप्त औसत पैदावार केवल 6.26 किं./हे. के राज्य औसत की तुलना में. 12.83 किं./हे. थी। इसी प्रकार, अरहर में तकनीकी प्रदर्शन के कारण प्राप्त औसत पैदावार कर्नाटक में 5.71 किं./हे. तथा तमिल नाडु में 6.29 किं./हे. के राज्य औसत की तुलना में 12.07 किं./हे. तथा 10.51 किं./हे. थी। इसलिए दलहन की बेहतर उत्पादकता प्राप्त करने के लिए इन जिला - विशेष प्रौद्योगिकियों में अपार क्षमता है बशर्ते कि किसानों को सही समय पर आवश्यक मात्रा में गुणवत्तायुक्त निवेश सामग्रियाँ उपलब्ध हों।
- वाणिज्यिक तथा बागबानी फसलों के प्रदर्शन में, प्रतिशत वृद्धि काफी में 15.66, मलबेरी में 17.15, गन्ने में 30.82, पान में 37.08, कपास में 31.06 स्टैलो में 66.67, करेले में 82.50 ककडी में 75.00, हरीमिर्च में 74.11, अमरंथस में 73.58, आलू में 29.25, जमीकंद अरुई में 22.36, साबूदाने में 17.55 केले में 23.22, अंगूर में 20.47, नींबू में 20.06 मौसमी में 36.03, आम में 42.88 अन्नानस में 39.67, अनार में 15.85, सपोटा में 12.85, तरबूज में 30.10, काली मिर्च में 51.02 सूखे मिर्च में 38.52 धनिया में 12.21, अदरक में 31.42 हल्दी में 22.03, सुपारी में 28.48 काजू में 52.64, नारियल में 26.85 चाय में 12.25, तारक में 14.30, गुलदाऊदी में 22.06, मोगरे में 22.23 गेंदे में 16.44, और रजनीगंधा में 35.86 थी, जिसके अलस्वरूप उच्चतर बीसीआर देखी गई और किसानों को प्रदर्शित किस्मों की क्षमता के बारे में भरोसा मिलि एवं साथ ही उत्पादन प्रौद्योगिकियों के बारे में भी वे आश्वस्त हुए।
- बागबानी फसलों में किसानों के अभ्यासों की तुलना में प्रदर्शनों के तहत फसल वृद्धि साग सब्जियों में फूलगोभी में 6.90 प्रतिशत से करेले 82.50 प्रतिशत थी, कसावे में 33.28



प्रतिशत, आलू में 29.25 प्रतिशत, शकरकंद में 22.36 प्रतिशत, फल फसलों में सपोटा में 12.85 प्रतिशत से आम में 42.19 प्रतिशत तक थी, मसाले में धनिया में 12.21 प्रतिशत से काली मिर्च में 51.02 प्रतिशत तक, बागान में चाय में 12.25 प्रतिशत से काजू में 52.64 प्रतिशत तक व फूलों में एस्टर में 14.30 प्रतिशत से रजनीगंधा में 35.86 प्रतिशत तक थी बीसीआर द्वारा यथासूचित प्रदर्शनों के तहत उपलब्ध आर्थिक प्रतिलाभ सभी बागबानी फसलों में उच्चतर थे, यह स्पष्ट करते हुए कि देश में उत्पादन को बढ़ाने में ये प्रयागिकियाँ सशक्त हैं।

- वाणिज्यिक फसलों में, फसल वृद्धि संबंधित फसलों में स्थानीय चेक की तुलना में उच्चतर बीसीआर के साथ काफी में 15.66 प्रतिशत से पान लता में 37.08 प्रतिशत तक थी। प्रदर्शन के कारण कपास में समग्र फसल वृद्धि स्थानीय चेक की तुलना में उच्चतर बीसीआर के साथ 31.06 प्रतिशत थी।
- प्रदर्शनों के अधीन चारा फसल वृद्धि संबंधित फसलों में किसान के अभ्यासों की तुलना में उच्चतर बीसीआर के साथ साइलो में 66.67 प्रतिशत थी।
- वर्ष के दौरान संकरों के पैदावारों ने सभी प्रदर्शनियों में स्थानीय चेक किस्म को पार किया है। धान तथा ज्वार में, किसानों की रीतियों की तुलना में, धान (21.19), मकई (16.87), सौरघम (23.26), बाजरा (38.12) एवं कुम्बु (31.67) का प्रतिशत पैदावार देखा गया। जबकि तिलहन, कैस्टर संकरों ने 40.39 प्रतिशत औसत पैदावार बढ़ोत्तरी दिखाई, और सुरजमुखी संकरों ने 18.05 प्रतिशत दर्शाई। कपास के संकरों में पैदावार में 23.35 प्रतिशत तक की बढ़ोत्तरी हुई। सब्जियों के संकरों में पैदावार फूलगोभी में 3.88 प्रतिशत से लेकर करेले में 25.56 तक उच्च हुई। कंद फसलों के संकरों में कसावा ने 27.88 प्रतिशत की वृद्धि दिखाई।
- पशु धन की विभिन्न उत्पादन प्रौद्योगिकियों के अंतर्गत कुक्कुट, भेड, बकरी सुअल-पालन, मात्स्यिकी पर प्रदर्शन संचालित किए गए। गायों में एआई के सही समय का पता लगाने के लिए क्रिस्टोस्कोपों की प्रस्तुति के बाद स्थानीय नस्लों में 95.20 प्रतिशत की गर्भधारण दर देखी गई। 2.81 के उच्चतम बीसीआर युक्त संकर नेपियर का चारा देने पर दोगलों में 746 से 10.59 लीटर/पशु/दिन तक की उत्पादन बढ़ोत्तरी देखी गई। भेड तथा बकरियों में टीकाकरण तथा कीटारहित करने के बाद चारा

प्रबंधन से 12 किग्रा से 45 किग्रा प्रति पशु की श्रेणी में शरीर का वजन बढ़ता है। सुअरबाडे में ड्युराक सुअर की सहायता से स्थानीय सुअरों के उन्नयन से चेक में 50 किग्रा/सुअर की तुलना में 70 किग्रा/सुअर का शरीर वजन प्राप्त किया जा सकता है। पिंजडा पद्धति में अतुल्या कुक्कुट पक्षियों ने पारम्परिक पद्धति में 70 अंडे/पक्षीवर्ष की तुलना में 274 अंडे/पक्षी/वर्ष का उच्चतम अंडा उत्पादन दर्ज किया। कुक्कुटों में श्वास संबंधी रोगों के प्रबंधन के फलस्वरूप स्वर्णधारा / गिरिराज में 94 प्रतिशत रोगनिवारण देखा गया जबकि मौखिक पेल्लेट आरकेटी टीके के उपयोग से स्थानीय कुक्कुट नसलों में 99 प्रतिशत तक प्रभावी रोगनिवारण देखा गया। चौडा सीनावाला कांस्य तथा चौडा सीनावाला बृहत, श्वेत पूरु पक्षी किसानों की पद्धति में 3.9 किग्रा/पक्षी की तुलना में 6.75 किग्रा/पक्षी देते हैं। विगोवा सुपर एम बतख ने पिडवाडे पद्धति के 2.25 किग्रा/पक्षी से बेहतर निष्पादन दिखाया। मत्स्य उत्पादन प्रौद्योगिकियों के विभिन्न घटकों के प्रदर्शन ने मत्स्य उत्पादन को 1250 से 8930 मछली/हेक्ट तक बढ़ाया।

- अन्य उद्यमों के अंतर्गत मधुवाटिका, रेशम की खेती, खुम्बी, फसलों में मूल्यवर्धन, पोष्टिकता बगीचा, आय उत्पादन के लिए कृमि-कम्पोस्ट में खुमी खेती में उच्चतम बीसीआर (6.37) तथा आम पकाने के लिए ईथाईलीन गैस किट में निम्नतम बीसीआर (1.18) देखी गई।
- विभिन्न फार्म उपकरणों जैसे, साइकिल अपतृण निष्कासक, बंगालग्राम फसल काटने के लिए हाथ दस्ताने, मिर्ची को सुखाने के लिए सौर सुरंग निर्जलीकारक, मूंगफली डिकार्टिकेटर, भूसा कर्तक, यंत्रिकृत धान प्रतिरोपक, हस्तचालित डिब्बल, चक्रीय पृथक्काकर, विवेक चावल भूसा स्टोव, नेंद्र केले में उच्च घनत्व रोपण में छोटी वेधनी, तार मानक आभासी तना आधार, कालीमिर्च श्रेषर, फरों फार्मर, ड्रम बीजवपित्र तथा विद्युत अपतृण निष्कासक, पूर्व अंकुरित धान बीजवपित्र तथा कोनो बीजवपित्र, संयोजित सुनेरा, आदन खेती के लिए विद्युत टिल्लर का उपयोग करते हुए यंत्रिकृत पलटनी, धान प्रतिरोपक, सीटीसीआरआई कसाबा लुनेरा, हल्दी वायलर छोटी यांत्रिक गाजन निर्मलीकरण मशीन, खम्भा गड्ढा खनित्र, यंत्रिकृत कपास संग्रहक, मकई खेती में यंत्रिकरण, उन्नत आम लुनेरा, सुधारी कैचा, संयोजित लुनेरा, आर्द्रभूमि ड्रम बीजवपित्र, चाय पतियों को निकालने के लिए एकल आदमी प्रचालित मशीन, चाय बागानों रम लागत को घटाने के लिए उच्च आयतन फुहारक तथा सीआरआईडीए

सब्जी परिरक्षक, की प्रस्तुति से, फार्म यंत्रीकरण के द्वारा श्रम एवं फार्म प्रचालनों की दक्षता एवं कड़ी मजदूरी में घटौति देखी गई।

3. दक्षता विकास

कृषि विज्ञान केंद्रों ने रिपोर्ट की जा रही अवधि के दौरान 409686 प्रतिभागियों के लिए कुल 11433 दक्षता विकास कार्यक्रम आयोजित किए. 11433 पाठ्यक्रमों में से 73.88 प्रतिशत आवश्यकता आधारित पाठ्यक्रम थे एवं शेष प्रायोजित तथा शेष व्यावसायिक पाठ्यक्रम थे। विशिष्ट उपलब्धियाँ निम्नानुसार हैं:

- अधिकांश प्रशिक्षण पाठ्यक्रम फसल उत्पादन (2706) तदनंतर पशुधन उत्पादन एवं प्रबंधन (1259) और बागबानी (1201) के क्षेत्र में थे। प्रतिभागियों में से, 147366 (35.97 प्रतिशत) महिलाएँ थीं। महिलाओं की अधिकतम प्रतिभागिता पशुधन उत्पादन तथा प्रबंधन (26998 प्रतिभागी) के क्षेत्र में, तदनंतर फसल उत्पादन (21363 प्रतिभागी) के क्षेत्र में थी।
- कृषि विज्ञान केन्द्रों द्वारा आयोजित दक्षता विकास कार्यक्रमों में अनुसूचित जाति तथा अनुसूचित जनजाति की प्रतिभागिता पर जोर दी जाती है, जहाँ कुल हिस्सा 19.93 प्रतिशत था (409686 प्रतिभागियों में से 81669)। भिन्न भिन्न दक्षता विकास क्षेत्रों में अ.जा./अ.ज.जा. समुदाय की प्रतिभागिता फसल उत्पादन (15786 प्रतिभागी) के क्षेत्र में अधिकतम थी, तदनंतर पशुधन उत्पादन एवं प्रबंधन (14168 प्रतिभागी) के क्षेत्र में थी।
- किसान तथा कृषक महिलाओं को लिए कु 7100 प्रशिक्षण पाठ्यक्रमों का आयोजन किया गया जिनमें 167619 पुरुषों तथा 86717 महिलाओं को प्रशिक्षित किया गया। इन पाठ्यक्रमों में कृषि तथा संबंधित क्षेत्रों के 17 प्रमुख क्षेत्रों को सम्मिलित किया गया। अधिकांश पाठ्यक्रम फसल उत्पादन (1771) तदनंतर सस्य संरक्षण (799) एवं पशुधन उत्पादन एवं प्रबंधन (785) के क्षेत्र में थे। कृषक महिलाओं की अधिकतम प्रतिभागिता पशु उत्पादन एवं प्रबंधन (17242) के क्षेत्र में थी व तदनंतर फसल उत्पादन (13338) में।
- ग्रामीण युवकों के लिए कुल 845 कार्यक्रम आयोजित किए गए। कुल 28513 प्रतिभागियों में से 12406 (43.51 प्रतिशत) प्रतिभागी महिलाएँ थी। ग्रामीण युवकों के लिए अधिकांश प्रशिक्षण कार्यक्रम ठेकेदारी विकास (162 पाठ्यक्रम व 4525

प्रतिभागी) और प्रक्रमण एवं मूल्य वर्धन (117 पाठ्यक्रम व 3135 प्रतिभागी) पर थे।

- विस्तारण कार्यकर्ताओं के लिए कुल 501 पाठ्यक्रमों का आयोजन किया गया, जिसमें 16123 कार्मिकों ने भाग लीष तमिलनाडु कृ.वि.के. ने 301 पाठ्यक्रमों का आयोजन किया जबकि कर्नाटक कृ.वि.के. ने 108 पाठ्यक्रमों का। अ.जा./अ.ज.जा. व महिला विस्तारण कार्यकर्ताओं की प्रतिभागिता क्रमशः 13.73 एवं 29.03 प्रतिशत थी।
- अंचल के अधिकांश कृ.वि.के. ने किसानों, कृषक महिलाओं, ग्रामीण युवकों एवं विस्तारण कार्यकर्ताओं के लाभार्थ प्रायोजित कार्यक्रमों का आयोजन किया। कुल 2593 पाठ्यक्रमों में से तमिलनाडु कृ.वि.के. ने 1097 पाठ्यक्रमों का आयोजन, केरल कृ.वि.के. ने 730 पाठ्यक्रमों का आयोजन एवं कर्नाटक कृ.वि.के. ने 716 पाठ्यक्रमों का आयोजन किया। अधिकांश आम प्रायोजकों में कृषि विभाग, राज्य विभाग योजना, बागबानी विभाग, केंद्र सरकारी विभाग तथा योजनाएँ, नाबार्ड, वित्तीय संस्थाएँ, पशुचिकित्सा तथा पशु-पालन, मत्स्यिकि विभाग, कृषि प्रौद्योगिकी प्रबंधन एजेंसी (आत्मा), वाटरशेड विभाग, रेशम उत्पादन विभाग, नेहरु युवक केन्द्र, वन विभाग, कृषि इंजीनियरी विभाग तथा जिला उद्योग केन्द्र शामिल है।
- रिपोर्टधीन अवधि के दौरान कृ.वि.के. द्वारा 394 व्यावसायिक पाठ्यक्रमों का आयोजन किया गया, जिनमें 10495 प्रतिभागियों (प्रति पाठ्यक्रम में औसत 27 प्रतिभागी) ने भाग लिया। केरल कृ.वि.के. ने 2878 प्रतिभागियों के साथ 132 पाठ्यक्रमों का आयोजन किया। तमिलनाडु में कृ.वि.के. ने 5271 प्रतिभागियों के साथ 174 पाठ्यक्रमों का आयोजन किया। अ.जा./अ.ज.जा. समुदाय की प्रतिभागिता 19.45 प्रतिशत थी तथा महिलाओं की 42.16 प्रतिशत ठेकेदारी विकास अग्रणी क्षेत्र था (91 पाठ्यक्रम) जिसके बाद प्रक्रमण एवं मूल्य वर्धन (56 पाठ्यक्रम) थे।

4. अग्र क्षेत्र विस्तार क्रियाकलाप

कृषि विज्ञान केन्द्रों द्वारा कुल 89326 विस्तार कार्यक्रमों का आयोजन किया और उपजातीय निष्पादन, उत्पादन प्रौद्योगिकियाँ, एकीकृत नाशी जीव एवं रोग प्रबंधन, पशु स्वास्थ्य एवं पोषण, कुक्कुट, मत्स्यिकी एवं मानव पोषण की उत्पान प्रौद्योगिकी जैसे कृषि तथा संबंधित क्षेत्रों की विभिन्न पहलुओं पर 29.86 लाख किसानों एवं 0.74 लाख विस्तार कार्यकर्ताओं एवं सार्वजनिकों के बीच जागृति पैदा की। साथ ही, कृषि



विज्ञान केन्द्र प्रौद्योगिकियों के समाचार पत्रों (2032), विस्तार साहित्यों (3214), लोकप्रिय लेखों (664), रेडियो वार्ताओं (575), टेलिविज़न वार्ताओं (391), प्रशिनियों (467) और किसान मेलाओं (170) के माध्यम से प्रचार किया एवं लोकप्रिय बनाया।

- 31 कृ.वि.के. द्वारा 4 से 6 दिनों की अवधियुक्त प्रौद्योगिकी सप्ताह मनाया गया तथा कृषि तथा संबंधित क्षेत्रों की विभिन्न पहलुओं में अद्यतन प्रौद्योगिकियों के बारे में 42935 किसानों और 804 कर्मचारियों के बीच जागृति उत्पन्न की। साथ ही, 147 साहित्य सामग्रियाँ, 26.02 क्विंटाल उच्च फसल की किस्में/संकर बीज, 28936 रोपण सामग्रियाँ, 6.92 क्विंटाल जैव-उत्पाद, 1.40 क्विंटाल जैव-उर्वरक, 2910 पशुधन एवं 514 आंगुलिक साझेदारों को उपलब्ध कराया गया।
- किसान चल सलाहकार सेवाओं (केआईएमएएस) के माध्यम से किसानों को 6525 पाठ संदेश, 1497 वाक्कोल तथा 387 पाठ तथा बाक कोलों को भेजा गया। इन सम्प्रेषणों में अधिकांश हिस्सा फसलों (4,042) का था, तदनंतर जागरूकता (1,765), मौसम (1,069), विपणन (977), पशुधन (852) तथा अन्य उद्यम (704) थे।
- कृ.वि.के. के स्टाफ को अद्यतन प्रौद्योगिकियों के बारे में कृ.वि.के. के हब नई दिल्ली से कृ.वि.के. से संबंधित अभिरूचि के विभिन्न विषयों पर विशेषज्ञों को शामिल करते हुए ई-लिकेज के द्वारा 26 ई-संगोष्ठियों के द्वारा सूचना दी जाती है।

5. प्रौद्योगिकीय निष्कर्षों का उत्पादन

कृषि विज्ञान केन्द्रों ने फसल-किस्मों के 5743.84 क्विं. बीजों, 1755.84 क्विं जैव-उत्पादों तथा फसल संकरों के 34.98 क्विं बीजों का उत्पादन किया जिनका मूल्य क्रमशः रु. 226.84, 82.75 और 0.66 लाख था एवं 60587, 48847 और 69 किसानों को वितरित किया।

- कृषि विज्ञान केन्द्रों ने विभिन्न किस्मों की 58.64 लाख रोपण सामग्रियों, संकरों की 2.86 लाख रोपण सामग्रियाँ तथा 2.09 लाख पशुधन नस्लों एवं महलिसों का उत्पादन किया जिनका मूल्य क्रमशः रु. 163.02, 2.35 और 76.24 लाख था एवं 125220, 2744 और 10786 किसानों को वितरित किया।
- कृषि विज्ञान केन्द्रों ने 1755.84 क्विं जैव उत्पादों, 387680 एसिरोफगस, 22550 ईपीएन, 10182 ट्राइको कार्ड तथा

7367 फेरोमोन जालों का उत्पादन कर वितरित किया जिससे 0.59 लाख किसान जैवित खेतीवारी करने व रासायनिक उर्वरको, कवकनाशियों एवं कीटनाशियों को घटाने के लिए प्रेरित हुए।

6. मिट्टी, जल और पौधों की जाँच

इस क्षेत्र के किसानों को विश्लेषणात्मक सेवाएँ प्रदान करने के लिए 67 कृषि विज्ञान केन्द्रों में मिट्टी, पानी और पौधों की जाँच करने की प्रयोगशालाएँ स्थापित की गईं। 15606 गाँवों के 32660 किसानों से प्राप्त मिट्टी, पानी, पौधा, खाद, चूना आदि के 38093.93 नमूनों का विश्लेषण किया गया और इनके परिणामों को उचित सलाह के साथ किसानों को दिया गया।

7. वर्षा जल संग्रहण

सोलह कृषि विज्ञान केन्द्रों ने वर्षा - जल - संग्रहण इकाई थी स्थापना की, जिस पर किसानों और विस्तार कार्यकर्ताओं के लिए 88 प्रशिक्षण कार्यक्रम और 61 प्रदर्शन आयोजित किए गए। इसके अलावा, इन इकाइयों की मदद से 1.57 लाख रोपण सामग्रियों को तैयार किया गया। साथ ही, 10348 किसानों एवं 590 कर्मचारियों ने इन इकाइयों का दौरा किया और वर्षा जल संग्रहण तकनीकों की जानकारी प्राप्त की।

8. कृषि विज्ञान केन्द्रों का अभिमुखीकरण एवं सर्म्पक क्षेत्र

रिपोर्टधीन अवधि के दौरान कृ.वि.के. ने अपने सम्पर्क तथा सहयोगात्मक क्रियाकलापों के तौर पर 22 विभिन्न संगठनों को शामिल किया है। यथा, कृषि विभाग, राज्य सरकारी विभाग एवं योजनाएँ, गैर सरकारी संगठन, बागवानी विभाग, पंचायत राज संस्थाएँ, राज्य कृषि विश्वविद्यालय, केन्द्र सरकारी विभाग तथा योजनाएँ, नाबार्ड, वित्तीय संस्थाएँ, पशुचिकित्सा तथा पशु-पालन, आईसीएआर संस्थाएँ, पशुचिकित्सा तथा पशु-पालन, आईसीएआर संस्थाएँ, जनसंचार तथा प्रिड मीडिया, किसान संघ एवं समूह, मत्स्यिक विभाग, कृषि प्रौद्योगिकी प्रबंधन एजेंसी (आत्मा), वाटरशेड विभाग, रेशम उत्पादन विभाग, जिला कलेक्टर कार्यालय, नेहरू युवक केन्द्र, वन विभाग, कृषि इंजीनियरी विभाग तथा जिला उद्योग केन्द्र।

9. कृषि विज्ञान केन्द्रों के माध्यम से किसानों की समृद्धि

किसानों को समृद्ध बनानेवाली कुछ सफल प्रौद्योगिकियाँ एवं विधियाँ निम्नलिखित हैं।

ब्रायलर बकरी पालन प्रौद्योगिकी कृ.वि.के. कालिकट सर्वोत्कृष्ट कार्यक्रम बनी है। एक साल से कम समय में विश्व भर के 160 से अधिक देशों के 75000 से अधिक संदर्शकों ने ब्रायलर बकरी प्रौद्योगिकी पर वीडियो माड्यूल / प्रौद्योगिकी कैम्पूल का वीक्षण किया।

- कृ.वि.के., पथनमथिट्टा के प्रयासों से ग्रामीण परिवार जलांडक व कुकुरमुत्ता के उत्पादन के लिए एडनाडु मश्रूम ग्रोवर्स संघ के गठन के द्वारा, जिससे जिले में कुकुरमुत्ता उत्पादन 2000 कि/माह से. जलांडक का उत्पादन जिले में 750 पैकेट / माह और रोजगार श्रम दिन 750 / माह से बढ़ा, कुकुरमुत्ता से पैसा बना पाए थे।
- कृ.वि.के., पथनमथिट्टा के प्रयासों से ग्रामीण परिवार जलांडक व कुकुरमुत्ता के उत्पादन के लिए एडनाडु मश्रूम ग्रोवर्स संघ के गठन के द्वारा, जिससे जिले में कुकुरमुत्ता उत्पादन 2000 कि / माह से, जलांडक का उत्पादन जिले में 750 पैकेट / माह एर रोजगार श्रम दिन 750 / माह से बढ़ा, कुकुरमुत्ता से पैसा बना पाए थे।
- कृ.वि.के., वायनाड द्वारा पेडल पम्पों की शुरुवात ने जिले में धान खेती के लिए जलवायु के प्रभाव से झेलने की क्षमता पर ध्यान दिया है। फलस्वरूप, जिले के 10 एनजीओ ने आदिवासी महिला श्रमिकों की क्षमता विकास के द्वारा इस पद्धति की ब्यासिस में 25 एकड़ों को लाने में कृ.वि.के., की मदद की तथा अधिक ग्रीष्म परती भूमि को धान जुताई के अधीन लाए।
- कृ.वि.के., सेलम द्वारा गन्ने की खेती करनेवालों के बीच संपोषणीय गन्ना पहल (एसएसआई) को अपनाने से प्रमुख घटक यथा, एकल कलीदार पौधा उपलब्ध कराने के उद्देश्य से सेलम जिले में और आस पास 20 एसएसआई नर्सरियों को स्थापित करने के लिए प्रेरित किया। फलस्वरूप, गत 4 वर्षों में सेलम जिले में एसएसआई क्षेत्र 10से 25 प्रतिशत तक बढ़ा है।
- जिले में जैवईंधन उत्पादक बाजार नेटवर्क के विकास के लिए कृ.वि.के. बेंगलूर के प्रयास महत्वपूर्ण हैं व परिणामस्वरूप बेंगलूर ग्रामीण जिले के हडनहल्ली, दोड्डबल्लापुर तालुक में एक टन दक्षता प्रति दिन की तेल निष्कासक मशीन सहित एक ग्रामीण जैवईंधन प्रक्रमण इकाई को स्थापित किया गया। समप्रति इकाई का पणयावर्त रु. 2072708 है तथा निवल लाभ रु. 268371 है, जिससे सभी सदस्य साभान्वित हुए हैं और साथ ही 200 से अधिक ग्रामीण परिवारों के लिए रोजगार अवसर सृजित हुआ है।

- आरकेवीवाई, जहाँ 60 रेशम उत्पादकों का संघ बना है, की मदद के कृ.वि.के., चिक्कलब्बापुर द्वारा क्रियान्वयनित क्लस्टर (गुच्छ) विधा द्वारा रेशम उत्पादन बढ़ा है। उन्होंने बैरोल्टाइन संकरों का पालन प्रारम्भ किया तथा 64.4 किग्रा/100 डीएफएल की औसत ककून उत्पादन प्राप्त की और 10 महीने की अरधि में कुल ककून उत्पादन करीब 25000 किग्रा था। उसी अवधि के लिए तालुक के औसत उत्पादन से बैरोल्टाइन ककून उत्पादकता 20 प्रतिशत अधिक थी।

10. पुरस्कार एवं मान्यताएँ

कृ.वि.के., कालिकट, केरल को वर्ष 2011 के लिए भारतीय कृषि अनुसंधान परिषद् का सर्वोत्तम क्षेत्रीय केवीके पुरस्कार प्राप्त हुआ है।

- कृ.वि.के., धर्मपुरि, तमिलनाडु को महिन्द्र और महिन्द्र द्वारा संस्थापित 2012 के लिए कृषि शिक्षा सम्मान पुरस्कार प्राप्त हुआ है।
- कृ.वि.के., पाण्डिचेरी के डॉ. एन. विजयकुमार, विषय विशेषज्ञ (कीटविज्ञान) को एकीकृत कीट प्रबंधन के क्षेत्र में उनके योगदानों के लिए राष्ट्रीय एवं अंतरराष्ट्रीय पुरस्कार प्राप्त हुए हैं।

11. कृषि प्रौद्योगिकी सूचना केन्द्र

एटीआईसी ने 10314 किसानों को प्रौद्योगिकी सेवाएँ उपलब्ध कराई है, साझेदारों को 151549.60 किं बोज, 57940 रोपण सामग्रियों तथा 111.65 किं जैव-उत्पादों को उपलब्ध कराया और किसानों से प्राप्त 2871 पत्रों के उत्तर के द्वारा सूचना सहायता उपलब्ध कराई एवं किसानों की शंकाओं के समाधान के लिए 6364 टेलीफोन कॉलों का जवाब दिया।

- साथ ही, एटीआईसी द्वारा किसानों को कुल 12254 किताबें एवं तकनीकी बुलेटिन, 490 सीडी, प्रौद्योगिकी सूची, वीडियो फिल्में व श्रव्य सीडी उपलब्ध कराए गए जिससे 12527 किसान लाभान्वित हुए।
- एटीआईसी ने 4598 किसानों को प्रशिक्षित किया और 1427 वीडियो प्रदर्शन दिखाया ताकि अद्यतन प्रौद्योगिकियों के बारे में किसानों को आश्वस्त कर सके।
- इन सेवाओं के द्वारा एटीआईसी ने रु. 96.85 लाख का राजस्व अर्जित किया।



12. विस्तार निदेशालय द्वारा प्रौद्योगिकी का समर्थन

विस्तार निदेशालय ने 40 क्षमता विकास कार्यक्रम आयोजित किए जिसके माध्यम से इस क्षेत्र के कृषि विज्ञान केन्द्रों के 387 कर्मचारियों को प्रशिक्षित किया। इसके अलावा, निदेशालय ने 49 कार्यशालाओं / बैठकों / संगोष्ठियों का आयोजन किया, जिनमें कृषि विज्ञान केन्द्र के 511 कर्मचारियों ने भाग लिया।

- रिपोर्टाधीन वर्ष के दौरान, विस्तार निदेशालय द्वारा 42 कृषि विज्ञान केन्द्रों को कुल 155.9 क्विंटाल कुक्कुट उत्पाद, 21 सुअर के बच्चड़, 17500 छोटी मछलियाँ एवं 2.86 क्विंटाल पोषक उपलब्ध कराए गए ताकि विभिन्न क्रियाकलापों को समय पर एवं प्रभावी ढंग से सम्पन्न करने के लिए समर्थन मिल सके।
- विस्तार निदेशक एवं उनके कर्मचारियों ने 58 विज्ञान सलाहकार समिति की बैठक, 63 क्षेत्र दिन, 49 क्षमता विकास कार्यक्रम एवं 12 प्रौद्योगिकी सप्ताहों में भाग लिया है। साथ ही उन्होंने ओएफटी के 81 क्षेत्र, एफएलडी के 102 क्षेत्र, 63 प्रशिक्षण कार्यक्रम, 77 विस्तार क्रियाकलाप व 23 किसान क्षेत्र शालाओं का क्षेत्र दौरा किया।

13. विशेष कार्यक्रम

रिपोर्टधीन अवधि के दौरान, कालादाल, हरादाल, अरहर, बल्लार तथा चना जैसे प्रमुख दलहन फसलों पर 544 प्रदर्शन संचालित किए गए जो दलहन उत्पादन को नियमित करने के लिए प्रौद्योगिकी प्रदर्शन के अंतर्गत कर्नाटक एवं तमिल नाडु राज्यों की दलहन खेतीबारी के एनएफएसएम क्रियान्वयक जिलों में 225.20 हेक्ट के क्षेत्र को व्यापत करते हुए किया गया। इनमें से 306 प्रदर्शनों को खरिफ 2012 के दौरान तथा क्रमशः 130.8 हेक्ट और 94.40 हेक्ट के क्षेत्र में क्रियान्वित किया गया।

- राष्ट्रीय जलवायु लचीली कृषि पहल (एनआईसीआरए) के अंतर्गत, 9 गाँवों में 888 किसानों को शामिल करते हुए एनआरएम संबंधित हस्तक्षेपों से 714.01 हेक्ट क्षेत्र का उपचार किया गया। फसल उत्पादन के अंतर्गत, 951 किसानों को लेकर 185.60 हेक्ट क्षेत्र में प्रौद्योगिकी प्रदर्शन सम्पन्न किए गए। पशुधन एवं मत्स्यकी के अंतर्गत 9 कृ.वि.कें.ने निम्नों को पेश किया, 6515 पशुओं की सुधरी नस्लों को टीका, कीडानिवारण, पोषण, रोग प्रबंधन, बीमा, नस्ल उन्नयन के साथ, 205 कुक्कुट पक्षी, चारा संग्रहण की 154 इकाइयाँ, कुक्कुटशाला, अधिक अंडा उत्पादन के लिए कुक्कुट की सुधरी

नस्लें, एकीकृत मछली तथा बतख पालन और पशुधन के लिए सुधारी शाला तथा सूखे के समय में चुने गए गाँवों में समुदाय भूमि में 16.05 हेक्ट सुधरी चारा खेतीबारी जिससे 2302 किसान लाभान्वित हुए। इसके अलावा, सूखे से संबंधित परिस्थितियों से जूझने के लिए 106.64 हेक्ट क्षेत्र को बीज बैंक, 28.7 हेक्ट को चारा बैंक के तौर पर विकसित किया गया।

- प्रौद्योगिकी अभिग्रहण में बेहतर समन्वयन के लिए गाँवों में उन्नीस वस्तु समूह बनाए गए और फार्म यंत्रीकरण के अभिग्रहण को आसान बनाने के लिए वांछित किराए पर योग्य केन्द्रों को स्थापित किया गया। साथ ही, 2808 किसानों को प्रशिक्षित किया गया ताकि खेती की लागत को घटाते हुए सामयिक फार्म कार्य चलाए जा सके। कृ.वि.कें.ने जलवायुविक पहलुओं पर 298 किसानों को ग्राम स्तर पर जलवायुविक केंद्र के द्वारा जलवायुविक साक्षरता प्रदान की है, और 320 विस्तारण कार्यक्रमों का आयोजन किया है जहाँ पर 3109 किसानों ने भाग लिया और लाभान्वित हुए।

14. मण्डलीय परियोजना निदेशालय के क्रियाकलाप

आंचलिक परियोजना निदेशालय के प्रशासनिक भवन के प्रथम तल का उद्घाटन सचिव, डीएआरई, भारत सरकार तथा महानिदेशक, आईसीएआर द्वारा 25 जनवरी, 2013 को किया गया। उक्त अवसर पर मण्डल VIII के आठ पुरस्कार विजेत कृषि विज्ञान केन्द्रों द्वारा कृषि प्रदर्शनी आयोजित की गई थी, यथा, रायचूर, कडलूर, ईरोड, उत्तर गोवा, कालिकट, कांचीपुरन, कण्णूर तथा मैसूर।

- कृषि तथा पशु पालन उद्यमों, जिनमें शामिल थे, धान- रागी, नारियल, केला, गन्ना, गाय और भैंस, भेड़ और बकरी तथा कुक्कुट, पर आठ शिवेष्ट व्यवस्थाओं का विकास किया गया तथा इनका उद्घाटन सचिव, डीएआरई, भारत सरकार तथा महानिदेशक, आईसीएआर द्वारा 25 जनवरी, 2013 को किया गया। साथ ही, इन आठ शिवेष्ट व्यवस्थाओं पर अंग्रेजी, तमिल, कन्नड और मलयालम में डीवीडी विमोचित किए गए।
- कृ.वि.कें. - उद्योग अंतरापृष्ठ बैठक का आयोजन 25 जनवरी, 2013 को किया गया, जिसमें मेसर्स जैन इरिगेशन, वीएसटी टिलल्लर्स ट्रेक्टर्स लि., बीसीआरएल, पीसीआई, ईएमएएआर, पेलिकान एक्विपमेंट्स ने भाग लिया और उप महा निदेशक, कृषि विस्तार, आईसीएआर, राज्य कृषि विश्वविद्यालयों के उप कुलपति, आईसीएआर संस्थानों के निदेशक, राज्य कृषि

विश्वविद्यालयों के डीई, मण्डल V से ज़डपीडी, कृ.वि.कें, के पीसी, और ज़डपीडी मण्डल के VIII विज्ञानियों ने भाग ली और परस्पर चर्चा की।

- मण्डल परियोजना निदेशालय - VIII मण्डल ने प्रौद्योगिकी मूल्यांकन, परिष्करण तथा प्रदर्शन पर अभिविन्यास कार्यक्रमों का आयोजन किया तथा 24 नए भर्ती कृ.वि.के.के स्टाफ को प्रशिक्षित किया। आगे, प्रशासन एवं लेखाकरण क्रियाविधियों पर दक्षता विकास कार्यक्रमों का आयोजन किया, जिसमें कृ.वि.कें, के 21 प्रशासनिक स्टाफ को विभिन्न प्रशासनिक एवं लेखाकरण क्रियाविधियों के बारे में जानकारी दी गई। साथ ही, रिपोर्टीन अवधि के दौरान, कृ.वि.के., स्टाफ के लाभार्थ प्रतिभागित प्रभाव अनुवीक्षण तथा मूल्यांकन (पीआईएमए) का आयोजन किया गया।

- इस निदेशालय ने 60 कार्यक्रम समन्वयक, 491 विषय विशेषज्ञ, 10 कार्यक्रम सहायक तथा 8 प्रशासनिक स्टाफ युक्त कुल 569 कृ.वि.के. के स्टाफ को देश में विभिन्न संगठनों द्वारा आयोजित कृषि तथा संबद्ध क्षेत्रों के विभिन्न पहलुओं एवं प्रशासनिक और लेखाकरण प्रक्रियाओं पर मानव संसाधन विकास कार्यक्रमों में भाग लेने के लिए प्रतिनियुक्त किया।
- कुल 19 प्रकाशन निकाले गए। 13 बैठक / कार्यशालाओं का आयोजन किया गया एवं मण्डल परियोजना निदेशक एवं निदेशालय के स्टाफ ने 61 बैठकों / कार्यशालाओं / सम्मेलनों / संगोष्ठियों, 82 एसएसी बैठकों एवं 31 प्रौद्योगिकी सप्ताहों में भाग लिया है।



Chapter 1

ABOUT ZONAL PROJECT DIRECTORATE

The Agricultural Extension Division, one of the eight Divisions of Indian Council of Agricultural Research (ICAR), New Delhi has established a network of Krishi Vigyan Kendras (KVKs) all over the country under the umbrella of ICAR institutes, SAUs, State Department of Agriculture and NGOs, with an aim to assess, refine and demonstrate technologies in agriculture and allied sectors. Agricultural Extension Division headed by the Deputy Director General (Agricultural Extension) monitors and reviews the progress of KVKs through its eight Zonal Project Directorates located at different parts of the country (Table1).

1.1 Genesis

The ICAR established 8 Zonal Coordinating Units (ZC Units) in September 1979 to monitor and coordinate its Lab to Land Programme (LLP) which was launched in 1979 on the occasion of ICAR's Golden Jubilee celebrations. To begin with, ZC Unit-Zone VIII had its office at Tamil Nadu Agricultural University (TNAU), Coimbatore but was subsequently, transferred to the campus of Regional Station of National Dairy Research Institute (RS, NDRI) at Adugodi, Bangalore in September, 1981. The jurisdiction of Zone VIII included Karnataka, Kerala, Tamil Nadu, Puducherry and Lakshadweep. The Unit was converted as a Plan Scheme in 1986 with additional staff and objective of

monitoring other Transfer of Technology Projects of ICAR viz., KVK, Trainers Training Centre (TTC), National Demonstration Scheme (NDS), Operational Research Project (ORP), Scheduled Caste & Scheduled Tribe Project and Special Project on Oilseeds. During 1990-91, another objective of implementing and monitoring of National Pulse Project was added. At this juncture, Goa was added to the jurisdiction of the Unit. The ZC Units were upgraded as Zonal Project Directorates (ZPDs) during the XI Five Year Plan (2009) with the same staffing pattern and infrastructure. The Zonal Coordinators were re-designated as Zonal Project Directors with financial and administrative powers akin to Directors of other ICAR institutes.

1.2 Mandate

Mandate of the Zonal Project Directorate is as follows:

- Formulate, implement, monitor and evaluate the programmes and activities of KVKs and Agricultural Technology Information Centres (ATICs).
- Coordinate the work relating to KVKs and ATICs implemented through various agencies such as SAUs, ICAR institutes, voluntary agencies and developmental departments.
- Coordinate with State/Central Government organizations, credit institutions and any other organization for successful implementation of programmes.

Table 1: Zonal Project Directorates and States/UTs

Zones	No. of States and UTs	States/UTs
I	5	Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir and Punjab
II	4	A & N Islands, Bihar, Jharkhand and West Bengal
III	8	Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura
IV	2	Uttar Pradesh and Uttarakhand
V	2	Andhra Pradesh and Maharashtra
VI	4	Rajasthan, Gujarat, Diu and Daman
VII	3	Chhattisgarh, Madhya Pradesh and Odisha
VIII	6	Karnataka, Tamil Nadu, Kerala, Goa, Puducherry and Lakshadweep

- Serve as feedback mechanism from the projects to research and extension systems.
- Help in implementation of other projects on oilseeds, pulses, maize, cotton, improved implements, climate resilience etc. assigned by ICAR headquarters.
- Have a very close liaison with ICAR headquarters particularly with Deputy Director General (Agricultural Extension) for preparing reports/write-ups for ICAR.

1.3 Staff

Total sanctioned staff strength of Zonal Project Directorate-Zone VIII, Bangalore is 18, out of which 16 are filled (Table 2).

Table 2: Staff strength of Zonal Project Directorate-Zone VIII

Category	Sanctioned	Filled
Zonal Project Director (RMP)	1	1
Scientific	6	5
Technical	2	2
Administrative	8	7
SSS(Gr-II)	1	1
Total	18	16

1.4 Organizational Structure

The organizational structure of Zonal Project Directorate-Zone VIII and KVKs functioning in the jurisdiction of this Directorate starting from Director General, ICAR is depicted in Fig.1.

1.5 Inauguration of First Floor of the Administrative Building

The first floor of the administrative building of ZPD-Zone VIII was inaugurated by Secretary, DARE, Government of India and Director General, ICAR on 25 January, 2013. During the function, Shri V.P.Kothiyal, Director (Works), ICAR, New Delhi felicitated the officials from CPWD namely Er.S.N.Rai, Superintendent Engineer (Civil); Er.M.P.Jose, Executive Engineer (Civil); Er.Mukunda Reddy, Assistant Engineer (Civil); Er. G.Anusha, Junior Engineer (Civil); Er. C.J.Jose, Assistant Engineer (Electrical);



Dr.S.Ayyapapan, Secretary, DARE, Government of India and Director General, ICAR inaugurating the first floor of the administrative building of ZPD-Zone VIII

Er.P.J.Sohan, Junior Engineer (Electrical) and Shri Govinda Swamy, Contractor, for completion of the first floor of the administrative building within the specified time period and estimated budget meeting all the technical specifications.

On the occasion, an exhibition was organized by eight award winning KVKs of Zone VIII during the period from 2005-06 to 2011 viz., Raichur (2005-06), Erode, North Goa (2008), Cuddalore, Kancheepuram, Kannur (2009), Mysore (2010) and Calicut (2011).



Dignitaries visiting exhibition stalls

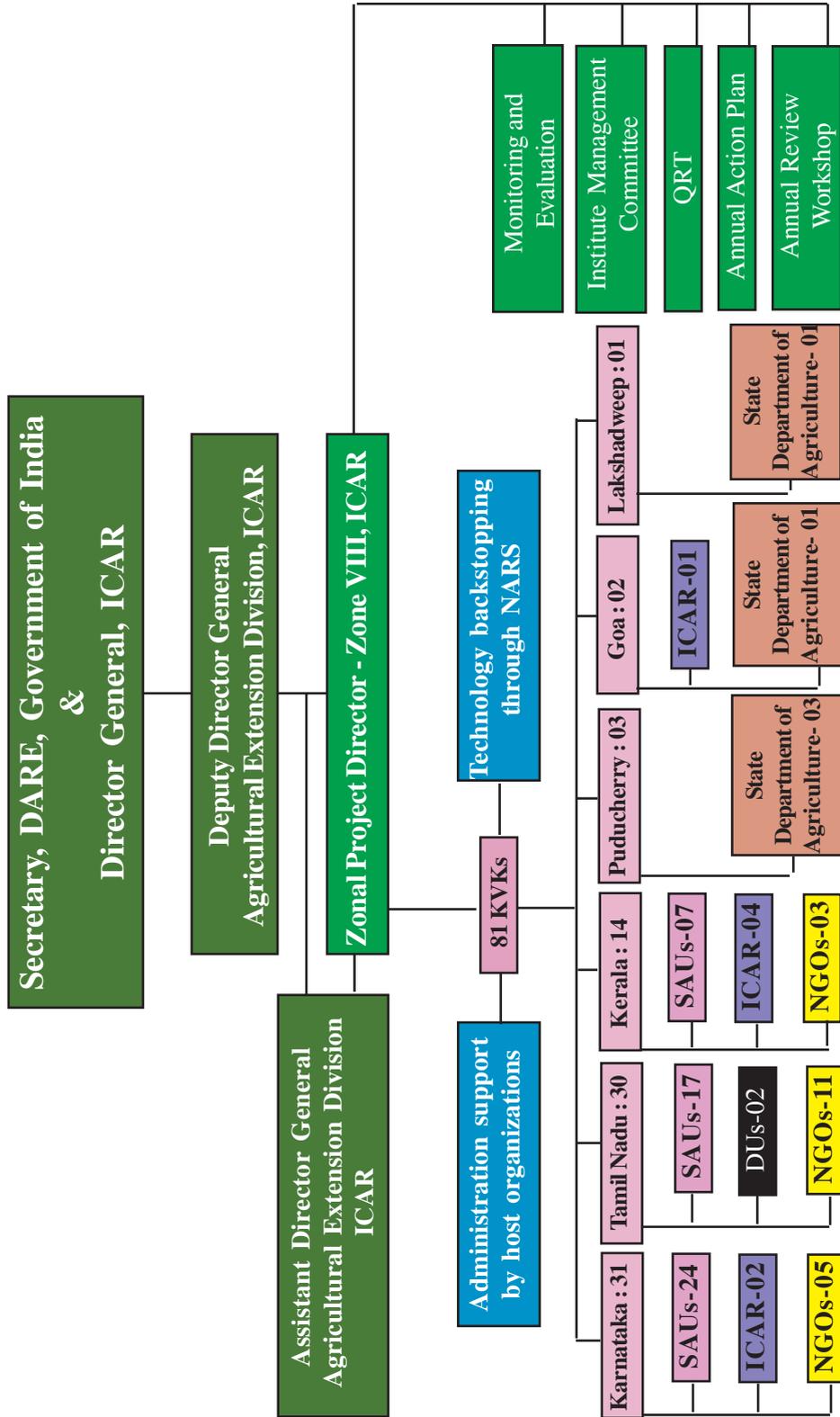


Fig.1 : Organizational structure of Zonal Project Directorate-Zone VIII



Dr.S.Ayyappan, Secretary, DARE, Government of India and Director General, ICAR and other dignitaries visiting exhibition stalls



1.6 KVK-Industry Interface Workshop

The Zonal Project Directorate–Zone VIII organized a KVK-Industry Interface workshop on 25 January, 2013 on the occasion of inauguration of first floor of its administrative building. Industries like M/s Jain Irrigation, VST Tillers Tractors Ltd, BCRL PCI, EMAAR and Pelican Equipments participated and

shared their latest technologies during the interface workshop chaired by Dr.K.D.Kokate, Deputy Director General (Agricultural Extension), Agricultural Extension Division, ICAR, New Delhi. Vice Chancellors of SAUs, Directors of ICAR Institutes, DEs of SAUs, Programme Coordinators (PCs) of KVKs, and Scientists from ZPD-Zone VIII and Zonal Project Director, Zone V participated in the interface workshop.



1.7 Development of Expert Systems for Agriculture and Animal Husbandry Enterprises

Keeping the importance of ICT enabled interventions in agriculture and providing timely expert advice to farmers, a network project entitled 'Development of Expert System for Agriculture and Animal Husbandry Enterprises' was sanctioned by ICAR to Directorate of Research for Women in Agriculture, Bhubaneswar with Zonal Project Directorate-Zone VIII, Bangalore as lead centre, and Directorate of Extension Education, Tamil Nadu Agricultural University, Coimbatore and Directorate of Extension, Tamil Nadu Veterinary and Animal Sciences University, Chennai as implementing centres.



Dr.K.D.Kokate, Deputy Director General (Agril. Extn.), Agricultural Extension Division, ICAR Chairing the session on KVK-Industry Interface Workshop

Under this project, eight expert systems on agriculture and animal husbandry enterprises comprising paddy, ragi, coconut, banana, sugarcane, cattle & buffalo, sheep & goat and poultry were developed and these were launched by Secretary DARE, Government of India and Director General, ICAR on 25 January, 2013. Deputy Director General (Agricultural Extension),



Launching of eight expert systems on agriculture and animal enterprises and release of DVDs in different languages

ICAR, New Delhi, Vice Chancellors of SAUs, Directors of ICAR Institutes and DEs of SAUs, Programme Coordinators of KVKs, from Zone VIII, Scientists from ZPD Zone VIII, Zonal Project Director from Zone V and Officials from expert system project participated in the occasion. Dr.R.Prabakaran, Vice Chancellor, TANUVAS, Chennai released DVDs on these expert systems whereas Dr.K.Narayana Gowda, Vice Chancellor, UAS, Bangalore released DVDs in Kannada language and Dr.P.V.Balachandran, Director of Extension, KAU, Thrissur released DVDs in Malayalam language for the usefulness of farmers and other stakeholders in Tamil Nadu, Karnataka and Kerala, respectively. Dr.S.Ayyappan, DG, ICAR, New Delhi felicitated Dr.E.Vadivel, Project Officer, e-Extension Centre, TNAU who is the main architect of expert systems and Dr. Krishna Srinath, Director, DRWA for their technical achievements in bringing out eight expert systems on agriculture and animal enterprises.

Prior to launching of the expert system and its usefulness, Dr.K.D.Kokate, DDG (Agricultural Extension) had convened a meeting on 24 January, 2013 with all the scientists and officials who involved in the project and the following decisions were taken:

- Expert systems are readily usable for stakeholders like extension personnel, Block Technology Managers of ATMA, SMSs etc, but it requires facilitation for farmers. Hence, mechanisms and processes need to be worked out to make expert systems more user friendly for farmers.
- English version of expert systems may be provided to all KVKs in the country and regional languages of the expert systems may be provided to respective state KVKs in Zone VIII.
- As a first phase of study in research mode on expert systems, 80 KVKs may be selected (10 KVKs in each Zone) for capacity building on expert systems. Study must involve different categories of users like men, women, illiterate, semi literate and literate etc. Bench mark data to be collected in all these districts before testing expert systems and it will be compared with traditional communication systems including frontline demonstrations, result demonstrations, field days etc. After 3-5 years, changes that expert systems bring about to be documented with authentic proof of data analysis.
- Apart from KVKs, expert systems may be provided to e-farmers and farm innovators identified by the ICAR for getting the systematic feed-back.
- Expert systems may be uploaded in KVK hub.
- Copyright for these eight expert systems must be obtained through proper procedures. Till copyright is secured by the ICAR, use of expert systems by any organization/agency/personnel may be avoided.
- Necessary budget provision may be made in 12th Plan EFC for further continuation of this network project with research dimension as discussed.

1.8 Budget

A total of Rs. 6124.45 lakh was sanctioned to Zone VIII for the year 2012-13 and 100 per cent of the sanctioned budget was incurred as expenditure. Head wise details of sanctioned budget and expenditure are furnished in Table 3.

Table 3 : Head wise budget and expenditure of Zone VIII for 2012-13

(Rs. in lakh)

Head	Sanction				Expenditure			
	ZPD	KVKs	Support to DEE at SAUs	Total	ZPD	KVKs	Support to DEE at SAUs	Total
(A) Recurring								
Pay & Allowance	139.00	4838.05	0.00	4977.05	139.00	4838.05	0.00	4977.05
TA	16.36	107.45	6.00	129.81	16.36	107.45	6.00	129.81
HRD	1.00	0.00	6.00	7.00	1.00	0.00	6.00	7.00
Contingencies	17.00	855.05	26.00	898.05	17.00	855.05	26.00	898.05
Total	173.36	5800.55	38.00	6011.91	173.36	5800.55	38.00	6011.91
(B) Non Recurring								
Works	27.56	83.98	0.00	111.54	27.56	83.98	0.00	111.54
Revolving Fund	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Total	27.56	84.98	0.00	112.54	27.56	84.98	0.00	112.54
Grand Total (A+B)	200.92	5885.53	38.00	6124.45	200.92	5885.53	38.00	6124.45



Chapter 2

ABOUT KRISHI VIGYAN KENDRAS

KVK is a unique scheme of ICAR oriented to serve the farmers, not only as fountainhead of technologies but also as the knowledge empowering institution. KVKs are the agricultural knowledge centres for farmers, farmwomen, rural youth and extension functionaries.

The first KVK was started in the country in 1974 and as on date, the number of KVKs has grown to 634. KVKs are established under different host organizations and hence have ownership at district level by cross-section of stakeholders like ICAR institutes, SAUs, Deemed Universities, State Governments and NGOs.

2.1 Establishment of KVKs

Based on the recommendation of Education Commission (1964-66), consideration/review by Planning Commission and Inter-Ministerial Committee, and further recommendation by committee headed by Dr. Mohan Singh Mehta appointed by ICAR in 1973, the idea of establishment of Farm Science Centre (Krishi Vigyan Kendra) was evolved. Subsequently, the first KVK was established in 1974 at Puducherry on a pilot basis under the administrative control of Tamil Nadu Agricultural University, Coimbatore. The XI Five Year Plan envisaged establishing additional KVK in larger

One new KVK in Kolar district of Karnataka was established in Zone-VIII during 2012-13 thus reaching the total number to 81.

districts. Zone VIII has the privilege of establishing the first additional KVK in Tumkur district, Karnataka under Indian Institute of Horticultural Research, Bangalore.

During the reporting period, one new KVK was established in Kolar district of Karnataka. With this, a total of 81 KVKs established under different host organizations viz., ICAR, SAUs, NGOs, DUs and State Department of Agriculture are functioning in Zone VIII. The state wise and host organization wise distribution of KVKs are presented in Table 4.

2.2 Mandate

Krishi Vigyan Kendras aim at assessment, refinement and demonstration of technology/products to cater to the needs of farming community, extension personnel and other stakeholders in the district. In order to accomplish this, KVKs are carrying out following activities:

Table 4: State and host organization wise KVKs

State	Host organizations					Total
	SAUs	NGOs	ICAR Institutes	DUs	SDA	
Karnataka	24	5	2	-	-	31
Tamil Nadu	17	11	-	2	-	30
Kerala	7	3	4	-	-	14
Goa	-	-	1	-	1	2
Puducherry	-	-	-	-	3	3
Lakshadweep	-	-	-	-	1	1
TOTAL	48	19	7	2	5	81

SAUs - State Agricultural Universities, NGOs - Non-Governmental Organizations

ICAR - Indian Council of Agricultural Research, DUs- Deemed Universities, SDA- State Department of Agriculture

- Conducting on-farm testing to identify the location specificity of agricultural technologies under various farming systems.
- Organizing frontline demonstrations to establish production potential of various crops and enterprises on the farmers' fields.
- Organizing need based training for farmers to update their knowledge and skills in modern agricultural technologies related to technology assessment, refinement and demonstration, and training of extension personnel to orient them in the frontier areas of technology development.
- Creating awareness about improved agricultural technologies among various clientele through an appropriate extension programmes.
- Production of quality seeds, planting materials, livestock breeds, animal products, bio-products etc as per the demand and supply of the same to different clientele.
- Work as knowledge and resource centre of agricultural technology to support the initiatives of public, private and voluntary sectors for improving the agricultural economy of the district.

2.3 Manpower

In order to carry out the mandated activities in the district, the approved strength of manpower for each KVK is 16, which includes one Programme Coordinator,

six Subject Matter Specialists, three Programme Assistants, two Administrative staff, two Drivers and two Supporting Staff. Accordingly, the total sanctioned staff for 81 KVKs of Zone VIII is 1296, out of which 1064 (82.10 per cent) are in position. Details of state wise and category wise staff strength of KVKs are furnished in Table 5.

2.4 Infrastructure Facilities

Out of 81 KVKs in Zone VIII, 77 KVKs have administrative building, 68 KVKs have farmers' hostel, 52 KVKs have staff quarters, 20 KVKs established rain water harvesting units, 37 KVKs have e-connectivity, 67 KVKs have soil and water testing labs, 10 KVKs have portable carp hatcheries, 4 KVKs have minimal processing units and 31 KVKs have plant health diagnostic labs. A total of 252 demonstration units have been established by the KVKs, 77 KVKs have jeep and a total of 150 two wheelers are there in the KVKs. Details are furnished in Table 6.

2.5 Scientific Advisory Committee

Scientific Advisory Committee (SAC) is the advisory body, which guides and reviews KVK activities. Head of host organization is the Chairman and other members include Zonal Project Director, Director of Extension, officials from all development departments of the district, representatives from SHGs and progressive farmers. SAC discusses the progress

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

Staff category	Karnataka		TamilNadu		Kerala		Goa		Puducherry		Lakshadweep		Total	
	(31)		(30)		(14)		(2)		(3)		(1)		(81)	
	S	F	S	F	S	F	S	F	S	F	S	F	S	F
Programme Coordinator	31	29	30	24	14	13	2	2	3	1	1	0	81	69
Subject Matter Specialist	186	153	180	165	84	75	12	9	18	11	6	4	486	417
Programme Assistant	93	66	90	84	42	29	6	4	9	5	3	0	243	188
Administrative staff	62	40	60	60	28	22	4	3	6	3	2	1	162	129
Driver	62	50	60	57	28	14	4	3	6	4	2	0	162	128
Supporting staff	62	47	60	59	28	19	4	3	6	4	2	1	162	133
Total	496	385	480	449	224	172	32	24	48	28	16	6	1296	1064

S - Sanctioned, F- Filled; Figures in parenthesis indicate number of KVKs

Table 6: State wise details of infrastructure in KVKs

Infrastructure	Karnataka (31)	Tamil Nadu (30)	Kerala (14)	Goa (2)	Puducherry (3)	Lakshadweep (1)	Total (81)
Administrative building	29	30	14	2	2	-	77
Farmers hostel	27	29	9	2	1	-	68
Staff quarters	17	25	9	1	-	-	52
Demo units	99	79	52	8	14	-	252
Rainwater harvesting unit	10	3	6	1	-	-	20
E-Connectivity	11	14	10	1	1	-	37
Soil & water testing lab	24	27	13	1	1	1	67
Portable carp hatchery	4	2	2	-	2	-	10
Minimal processing unit	1	1	2	-	-	-	4
Plant health diagnostic lab	9	16	5	-	1	-	31
Jeep	30	30	13	2	2	-	77
Two wheeler	60	55	26	1	5	3	150

Figures in parenthesis is number of KVKs



Piggery unit at KVK, Bangalore Rural



Rain water harvesting unit at KVK, Dharwad



Goat rearing unit at KVK, Coimbatore



Azolla sp. unit at KVK, Pathanamthitta



A view of SAC meeting of KVK

of work done in various mandatory activities and provide guidance for future activities. All KVKs have constituted the Committee and a total of 82 SAC meetings were conducted by 69 KVKs, during the year.

2.6 Revolving Fund

Revolving fund is in operation at 74 KVKs of the Zone. The KVKs are utilizing revolving fund for production of technological products and the net balance as on March 31, 2013 was Rs.5.10 crore. During the reporting period, a net balance of more than Rs.20 lakh was there in 6 KVKs followed by Rs.10 to 20 lakh in 6 KVKs, Rs.4 to 10 lakh in 23 KVKs, Rs.1 to 3 lakh in 31 KVKs and less than rupees one lakh in 8 KVKs.

Net balance of Rs.5.10 crore was available as on 31 March, 2013 under revolving fund and 6 KVKs have a net balance of more than Rs.20 lakh.

2.7 Thrust Areas

As per the agro-ecological and existing cropping & farming systems, KVKs are working with the following identified broad thrust areas:

- Introduction and up-scaling of improved varieties/ hybrids of crops and livestock breeds through technical back-up and quality input supply
- Sustainable crop production through integrated nutrient management and organic farming strategies
- Integrated pest and disease management
- Development and promotion of crop diversification and alternate land use system
- Empowerment of women and youth in terms of improved nutrition, income and drudgery reduction through technological literacy
- Scientific management of dairy and small livestock
- Promotion of horticulture as a mechanism of crop diversification, augmenting family and national income
- Soil, water conservation and watershed management for drought proofing and sustainable rainfed farming
- Value addition, processing and market facilitation of household and commercial enterprises
- Small scale mechanization for saving time and reducing cost and drudgery
- Capacity building of rural youth and women to establish self-employment units
- Increasing income from fishery enterprises through production, processing and marketing.

Chapter 3

ACHIEVEMENTS

3.1 Krishi Vigyan Kendras

Achievements under each of the major activities carried out by the KVKs are described in this section.

3.1.1 Technology assessment and refinement

National Agricultural Research System (NARS) evolves many technologies in agriculture and its allied enterprises. In order to ensure their suitability to local conditions, Krishi Vigyan Kendras undertake the process of Technology assessment and refinement through on Farm Trials based on participatory approach involving farmers. During the reporting year, a total of 339 technologies were assessed (302 agriculture/horticulture, 31 animal husbandry and 6 empowerment of rural women) through 3230 on farm trials in 467 locations (Fig.2). Besides, 12 technologies were refined through 70 trials taken up in ten locations.

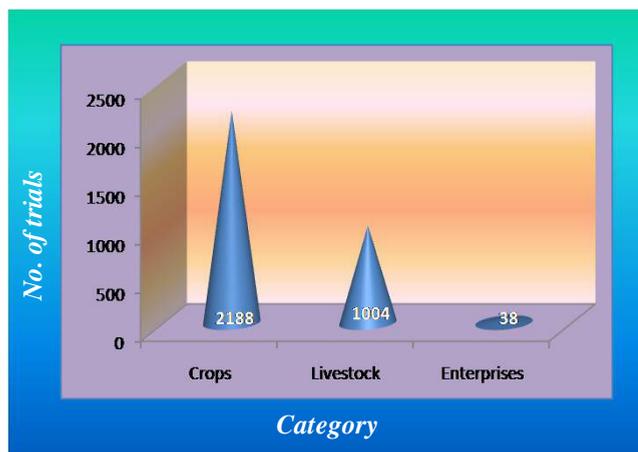


Fig. 2 : No. of trials conducted under technology assessment in different categories

3.1.1.1 Technology assessment: KVKs have assessed 302 technologies on various crops under various thematic areas of which more number of technologies were assessed under varietal evaluation (91) followed by integrated nutrient management (43), integrated disease management (32), integrated pest management (32), integrated crop management (30), resource conservation technologies (16), cropping

system (14), farm machinery (10), processing and value addition (8), integrated pest and disease management (7), weed management (7), seed/planting material production (4), integrated farming system (3), drudgery reduction (3) and storage techniques (2). Details on number of trials and number of locations under each thematic area are presented in Table 7.

From Table 8, it could be observed that 103 technologies were assessed through 746 trials by 28 KVKs in Karnataka followed by 98 technologies assessed through 575 trials by 14 KVKs in Kerala, 90 technologies assessed through 804 trials by 30 KVKs in Tamil Nadu, 6 technologies assessed through 35 trials by 2 KVKs in Puducherry and 5 technologies assessed through 28 trials by 2 KVKs in Goa.

In the case of animal husbandry, poultry and fisheries, KVKs have assessed 31 technologies on various thematic areas including production and management (10), evaluation of breeds (9), disease management (6), and nutrition management (6). Details on number of trials and locations on each thematic area are presented in Table 9, whereas Table 10 gives the state wise break up of a total of 31 technologies assessed. This includes ten technologies each, assessed



A view of on farm assessment of nutrient management of tapioca at high rainfall zone in Kanyakumari district of Tamil Nadu

Table 7: Thematic area wise technology assessment under crops

Thematic area	No. of technologies	No. of trials	No. of locations
Varietal evaluation	91	590	111
Integrated nutrient management	43	406	68
Integrated disease management	32	239	45
Integrated pest management	32	276	39
Integrated crop management	30	168	35
Resource conservation technology	16	80	18
Cropping system	14	89	18
Farm machinery	10	52	13
Processing and value addition	8	45	9
Integrated pest and disease management	7	67	9
Weed management	7	87	15
Seed/planting material production	4	17	4
Integrated farming systems	3	18	3
Drudgery reduction	3	44	6
Storage techniques	2	10	2
Total	302	2188	395

Table 8 : State wise technology assessment under crops

State	No. of technologies	No. of trials	No. of KVKs
Karnataka	103	746	28
Tamil Nadu	90	804	30
Kerala	98	575	14
Goa	5	28	2
Puducherry	6	35	2
Total	302	2188	76



A view of on farm assessment of IDM of cabbage in Belgaum district of Karnataka with visitors



On farm assessment of Bhima onion variety in Gulbarga district of Karnataka

Table 9: Thematic area wise technology assessment under animal husbandry, poultry and fisheries

Thematic area	No. of technologies	No. of trials	No. of locations
Production and management	10	135	14
Evaluation of breeds	9	55	10
Disease management	6	97	7
Nutrition management	6	717	31
Total	31	1004	62

Table 10 : State wise technology assessment under animal husbandry, poultry and fisheries

State	No. of technologies	No. of trials	No. of KVKs
Karnataka	6	38	7
Tamil Nadu	10	803	24
Kerala	10	139	6
Puducherry	3	20	1
Goa	2	4	1
Total	31	1004	39

through 803 trials by 24 KVKs in Tamil Nadu and in 139 locations by six KVKs in Kerala. In Karnataka, six technologies were assessed through 38 trials by 7 KVKs of the state.

In the case of technologies assessed for empowerment of rural women, six technologies were assessed under two thematic areas viz., production and management (4) and varietal evaluation (2) and the details on number of trials and locations under each

thematic area are presented in Table 11 and the state wise break up is given in Table 12.

3.1.1.2 Refinement: KVKs have refined 12 technologies on crops, livestock and other enterprises through 70 trials in 12 locations (Table 13). Out of these, nine technologies were refined under crops, one each under animal husbandry, drudgery reduction and farm machineries. State wise break up of these technology refinements is given in Table 14. Data indicated that



On farm assessment of Sirohi goat in Erode district of Tamil Nadu



On farm assessment of cage culture for fresh water fish in Ernakulam district of Kerala

Table 11 : Thematic area wise technology assessment for empowerment of rural women

Thematic area	No. of technologies	No. of trials	No. of locations
Production and management	4	14	4
Varietal evaluation	2	24	4
Total	6	38	8

Table 12 : State wise technology assessment for empowerment of rural women

State	No. of technologies	No. of trials	No. of KVKs
Tamil Nadu	1	3	1
Kerala	4	30	6
Puducherry	1	5	1
Total	6	38	8

Table 13 : Thematic area wise technology refinement under crops, animal husbandry and other enterprises

Thematic area	No. of technologies	No. of trials	No. of locations
Integrated crop management	2	10	2
Integrated nutrient management	2	15	2
Resource conservation technology	2	10	2
Integrated disease management	1	5	1
Processing and value addition	1	5	1
Storage techniques	1	5	1
Production and management of animals	1	3	1
Drudgery reduction for women	1	15	1
Farm machinery for women	1	2	1
Total	12	70	12

eight technologies were refined through 35 trials by six KVKs in Kerala followed by two technologies refined through 25 and 10 trials by two KVKs each in Karnataka and Tamil Nadu, respectively (Fig.3).

3.1.1.3 Location specificity of the technologies

(A) Varietal evaluation

(i) Assessment of paddy varieties in Karnataka: Paddy is the major cereal crop cultivated in southern and north eastern parts of Karnataka. The average productivity of the crop is 25 q/ha. Tella Hamsa, Rasi, Thanu are some of the popular varieties of paddy cultivated in Uttara Kannada, Chitradurga and Chickballapur districts respectively. The average

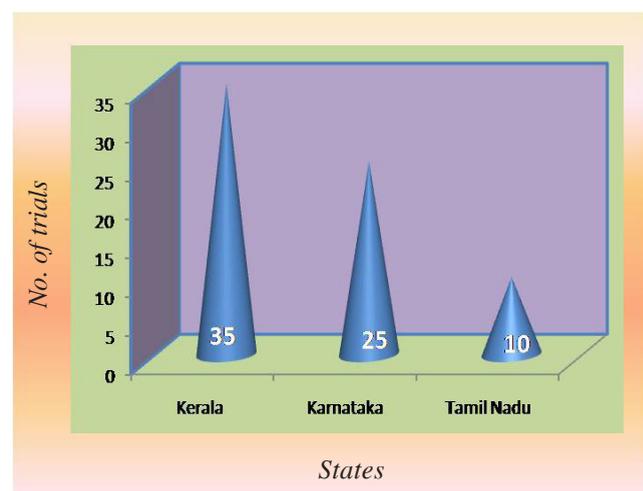


Fig. 3 : State wise no. of trials conducted under technology refinement

Table 14 : State wise technology refinement under crops, animal husbandry and other enterprises

State	No. of technologies	No. of trials	No. of KVKs
Karnataka	2	25	2
Tamil Nadu	2	10	2
Kerala	8	35	6
Total	12	70	10

productivity of these varieties is about 35 q/ha. In order to realize higher productivity in paddy, these KVKs have undertaken assessment of high yielding varieties viz., IR 30864 and GV 0501 (Chitradurga); Rasi and KMP 105 (Uttara Kannada), Tella Hamsa, Tanu and GV0501 (Chickballapura).

The realized yield and economics was maximum in GV0501 with 51 q/ha and 1.64 BCR in Chitradurga and 46.4 q/ha and 1.54 BCR in Chickballapura. Variety KMP 105 was promising with 45.40 q/ha and 1.54 BCR in Uttara Kannada

KVK Mysore assessed salt tolerant paddy varieties IR 64, IR 30864 and CSR 22 through on farm trials and the results indicated that the yield and economics was higher in CSR 22 (45.40 q/ha; BCR 1.88).

Farmers feedback indicated that those farmers who have dairy as a component in their farm, gave more importance to grain as well as straw yield of paddy and hence prefer varieties with fairly higher level of grain and straw yield.



On farm assessment of paddy varieties in Karnataka

(ii) Assessment of paddy varieties in Tamil Nadu: Paddy is widely cultivated in most of the districts of

Tamil Nadu. The average productivity is 34.90 q/ha. Thiruvarur and Thanjavur districts are the rice bowls of the state accounting for more than 50 percent of the total production. In order to further augment productivity, Thiruvarur and Thanjavur KVKs assessed high yielding paddy varieties viz., ADT 43, ADT 47 and Co 47. The results indicated that ADT 43 recorded higher yield and better economics (67.50 q/ha; BCR 2.16) in Thiruvarur district, while Co 47 was better (44.80 q/ha; BCR 2.30) in Thanjavur district.



On farm assessment of paddy varieties in Tamil Nadu

In another set of on farm trials, KVK Dharmapuri assessed the performance of ADT 39, Co 50 and ADT 49, in which Co 50 gave maximum yield and economic returns (55.68 q/ha; BCR 1.78).

Farmers are fully satisfied with the performance of these varieties and they stated that though an assured higher yield is expected from these varieties, concerned authorities must continue to support paddy cultivation by fixing reasonable price for the produce.

(iii) Assessment of paddy varieties in Kerala: Like other southern states in the country, paddy is the major

food crop in Kerala. The average productivity of the crop is 24.30 q/ha. However under Kuttanad conditions with soil related problems, the average yield is further low viz., 20.00 q/ha. During the recent past, the profitability of paddy cultivation in the state is increasing due to group farming practices especially through mechanization. KVK Alleppey assessed high yielding varieties viz., Uma, Jyothi and Pratyasha and found that Pratyasha gave higher yield and realized better economics (53 q/ha; BCR 2.96).

In another set of on farm trials conducted by KVK Kottayam, performance of Anna 4 was compared with that of Uma and Vytilla varieties, wherein Anna 4 out yielded other varieties (36 q/ha; BCR 1.66).

Farmers expressed their satisfaction on performance of Pratyasha and Anna 4 varieties in terms of yield and economics and requested that respective KVKs need to ensure the availability of seeds for few more seasons.

(iv) Assessment of groundnut varieties in Karnataka: Groundnut is a major oilseed crop of Karnataka cultivated mainly under rainfed conditions. The average productivity of groundnut in the state is 15 q/ha and in order to increase the productivity, Belgaum, Chamrajanagar, Tumkur II, and Koppal KVKs assessed the performance of high yielding varieties of groundnut. The results indicated that GPBD 4 performed better in terms of yield and economics in Belgaum (22 q/ha; BCR 4.69), Koppal (16.30 q/ha; BCR 1.93) and



On farm assessment of groundnut varieties in Karnataka

Chamrajanagar districts (15.80 q/ha, BCR 1.51), while GPBD 5 gave higher yield and economics in Tumkur II (12.50 q/ha; BCR 2.3).

Farmer's feedback was positive both in terms of technical feasibility and economic viability of the new varieties.

(v) Assessment of groundnut varieties in Tamil Nadu: Groundnut is a major crop of Tamil Nadu cultivated both under irrigated and rainfed conditions. The average yield is about 19 q/ha. The present level of productivity can be increased with new high yielding varieties and in order to assess their performance, KVKs Ariyalur and Vellore have conducted on farm trials with high yielding varieties viz., TMV 7, VRI 2, GG7, ICGV91114 and Co 6.

The results indicated that the variety GG7 gave maximum yield and better economics (22.86 q/ha; BCR 2.93) in Ariyalur as compared to VRI 2 and ICGV 91114, whereas in Vellore ICGV91114 gave higher yield and economics (19.25 q/ha; BCR 2.08) as compared to TMV 7 and Co 6.

In Vellore district, farmers who cultivated ICGV91114 variety stated that they were much satisfied about yield and crop growth and requested that the technology may be extended to more area.

(B) Integrated Crop Management

(i) Organic cultivation of vegetables in Kerala: Kasaragod district of Kerala has been declared as organic district by the government of Kerala. Hence KVK Kasaragod is giving more emphasis on this thematic area. Accordingly, KVK conducted assessment of technologies for organic cultivation in major vegetable crops viz., amaranthus (var Arun), bitter gourd (var Priyanka), yard long bean (var Vellayani Jyothika) and bhendi (var Salkeerthi).

The results indicated that application of FYM as basal dose and poultry manure as top dressing gave higher yield and economics viz., amaranthus (122 q/ha; BCR 1.88), bitter gourd (128 q/ha; BCR 2.89), yard long bean (173.50 q/ha; BCR 3.71) and bhendi (138.60

High yielding varieties recommended for up-scaling through frontline demonstrations

- Paddy varieties - GV0501 with yield and economics of 51.00 q/ha and BCR 1.64 and 46.40 q/ha and BCR 2.07 in Chitradurga and Chickballapur districts, respectively, KMP 105 (45.40 q/ha; BCR 1.54) in Uttara Kannada district, CSR 22 (45.40 q/ha; BCR 1.88) in Mysore district of Karnataka, ADT 43 (67.50 q/ha; BCR 2.16) in Thiruvarur district, Co 47 (44.80 q/ha; BCR 2.30) in Thanjavur district, Co 50 (55.68 q/ha; BCR 1.78) in Dharmapuri district in Tamil Nadu, Pratyasha (53.00 q/ha; BCR 2.96) in Alleppey district, Anna 4 (36 q/ha; BCR 1.66) in Kottayam district in Kerala are recommended for up-scaling through FLDs.
- Groundnut varieties - GPBD 4 with yield and economics of 22 q/ha and BCR 4.69 and 16.30 q/ha and BCR 1.93 in Belgaum and Koppal districts, respectively, GPBD 5 (12.50 q/ha; BCR 2.30) in Chamrajnagar district in Karnataka, GG7 (22.86 q/ha; BCR 2.93) in Ariyalur district, ICGV91114 (19.25 q/ha; BCR 2.08) in Vellore in Tamil Nadu were recommended for up-scaling through FLDs.

q/ha; BCR 3.87). Application of FYM as basal dose and vermicompost in split dose for top dressing also gave higher yield in amaranthus (104 q/ha; BCR 1.34), bitter gourd (109 q/ha; BCR 2.76), yard long bean (168.60 q/ha; BCR 3.43) and bhendi (137 q/ha; BCR 3.51). Farmers expressed their satisfaction about the organic cultivation of vegetables.

(C) Nutrient management

(i) Assessment of maize maxim in increasing productivity: Maize is an important crop cultivated under rainfed conditions in Karnataka. The average productivity of maize ranged from 20.00 to 29.00 q/ha. For realizing higher productivity in maize, KVKs Hassan, Chickmagalur and Bangalore Rural have conducted assessment of maize maxim through on farm trials.

The results indicated that application of NPK @ 100:50:25 kg/ha + Zinc Sulphate @ 10 kg/ha + foliar spray of 2.5 per cent maize maxim realized better yield and economics at Hassan (62.50 q/ha; BCR 2.94) and Chickmagalur (61 q/ha; BCR 2.30) districts. In the case of Bangalore Rural district, application of NPK @ 150:75:40 kg/ha and ZnSo₄ @ 10 kg/ha along with foliar spray of 2.5 per cent maize maxim during flowering stage followed by second spray after 15 days of first spray gave maximum yield and better economics (74.55 q/ha; BCR 2.79).

(ii) Assessment of Sulphur Oxidizing Bacteria in groundnut: Tamil Nadu Agricultural University, Coimbatore had evolved a new technology for micro nutrient management in crops including groundnut. Farmers in general apply *Rhizobium* sp, and or sulphur to groundnut crop. Sulphur Oxidizing Bacteria (SOB) was found to be effective in increasing the pod yield and for better crop growth. In order to assess the location specificity of this technology, KVKs Trichirappalli, Dharmapuri, Thanjavur, Ariyalur, Villupuram, Theni and Krishnagiri conducted on farm trials.

The results indicated that seed treatment with *Rhizobium* @ 2kg/ha + SOB @ 1 kg/ha + soil



On farm assessment of Sulphur Oxidizing Bacteria in groundnut

Crop management technologies recommended for up-scaling through frontline demonstrations

- Application of FYM as basal dose of fertilizer along with application of poultry manure for top dressing in amaranthus, bitter gourd, yard long bean and bhendi gave higher yield of 122.00 q/ha, 128.00 q/ha, 173.50 q/ha, and 138.60 q/ha respectively in Kasaragod district of Kerala.
- Application of NPK @ 100:50:25 kg/ha + Zinc Sulphate @ 10 kg/ha + Foliar spray of 2.5% maize maxim to maize crop gave an yield of 62.50 q/ha, and 61.00 q/ha in Hassan and Chickmagalur districts, respectively whereas application of NPK, 150:75:40 kg/ha and ZnSo₄ 10 kg/ha along with foliar spray of maize maxim @ 2.5% gave an yield of 74.55 q/ha in Bangalore Rural district in Karnataka.
- In groundnut, seed treatment with rhizobium @ 2kg/ha + sulphur oxidizing bacteria (SOB) @ 1 Kg/ha + soil application of SOB @ 5 kg/ha on 45th day + gypsum @ 200 Kg/ha as basal dose gave higher yield of 21.40 q/ha and 25.20 q/ha in Trichirappalli and Dharmapuri districts, respectively. Whereas, seed treatment of SOB + rhizobium @ 1 kg/ha + *Pseudomonas* @ 10 g/kg + *Trichoderma viride* @ 4 g/kg as well as soil application of SOB @ 5 kg/ha on 45 DAS during earthing up + gypsum application @ 400 kg/ha gave higher yield of 18.90 q/ha in Villupuram district. Application of RDF (17:34:54 kg NPK/ha) + gypsum @ 400kg/ha (basal 200 kg & 200 kg at 45 DAS) + seed treatment of SOB + *Rhizobium*@1kg/ha + soil application of SOB @ 5kg/ha on 45 DAS during earthing up gave higher yield of 22.00 q/ha in Theni, 22.30 q/ha in Thanjavur, 22.51 q/ha in Ariyalur and 10.90 q/ha under rainfed in Krishnagiri districts in Tamil Nadu.
- Application of FYM 20 t/ha, NPK 70:25:25 kg/ha in two splits gave high yield of 78.80 q/ha and 82.50 q/ha in bitter gourd and ridge gourd respectively in Dakshina Kannada district whereas application of FYM 25 t/ha + NPK: 75:25:25 kg/ha in 2 splits gave higher yield of 98.80 q/ha and 99.80 q/ha in bitter gourd and ridge gourd, respectively in Udupi district in Karnataka.
- In blackgram, application of pre-emergence herbicide pendimethalin @ 0.75 kg ai/ha on 3 DAS + post emergence application of Imazethapyr @ 60 g a.i/ha on 15 days after emergence of weeds (2 leaf stage) gave better control of weeds and higher yield of 11.50 q/ha in Ariyalur, 10.36 q/ha in Pudukottai and 9.38 q/ha in Thiruvallur districts of Tamil Nadu.
- Power weeder was found to be highly economical for the management of weeds in paddy and gave yield of 60.50 q/ha in Palakkad district, 61.56 q/ha in Pathanamthitta district and 57.85 q/ha in Alleppey district of Kerala, 63.55 q/ha in Karur district and 67.64 q/ha in Nagappatinam district of Tamil Nadu.

application of SOB @ 5 kg/ha on 45th day + application of gypsum @ 200 kg/ha as basal dose gave higher yield and better economics at Trichirappalli (21.40 q/ha; BCR 2.41) and Dharmapuri (25.20 q; BCR 3.60).

In Villupuram district, seed treatment of SOB + *Rhizobium* @ 1 kg/ha + *Pseudomonas* @ 10 g/kg + *Trichoderma viride* @ 4 g/kg as well as soil application of SOB @ 5 kg/ha on 45 DAS during earthing up + gypsum application @ 400 kg/ha gave higher yield and better economics (18.90 q/ha; BCR 1.58), while application of RDF (17:34:54 kg NPK/ha) + gypsum

@ 400kg/ha (basal 200 kg & 200 kg at 45 DAS) + seed treatment of SOB inoculants + *Rhizobium*@1kg/ha + soil application of SOB @ 5kg/ha on 45 DAS during earthing up gave higher yield and economics in Theni (22.00 q/ha; BCR 2.88); Thanjavur (22.30 q/ha ; BCR 1.61); and Ariyalur 22.51 q/ha; BCR 3.21). Its performance at Krishnagiri was low due to severe drought conditions (10.90 q/ha; BCR 1.53).

Feedback from the farmers was highly encouraging and they stated that the concerned KVKs and development departments need to spread this

technology among the farmers. However, a group of farmers still have doubt about the performance of the technology under stress conditions and they opined that the same may be further assessed.

(iii) Integrated Nutrient Management in gourds: Cucurbitaceous vegetable crops like bittergourd and ridgegourd are widely cultivated by farmers of coastal Karnataka especially in Dakshina Kannada and Udupi districts. They are small holder's crops and hence for realization of better profit, integration of resources requires more attention by the farmers.

KVKs Dakshina Kannada and Udupi have assessed the performance of split application of nutrients in bittergourd and ridgegourd. In Dakshina Kannada district, the results indicated that application of FYM @ 20 t/ha, NPK @70:25:25 kg/ha in two splits realized better yield and economics in bittergourd (78.80 q/ha; BCR 2.60), whereas application of FYM @25 t/ha + NPK: @75:25:25 kg/ha in two splits gave higher yield and better economics in ridgegourd (82.50 q; BCR 2.13).

In Udupi district, the results in bitter gourd indicated that application of recommend dose of NPK @75:25:25 kg/ha, N in two splits realized better yield and economics (98.80 q/ha; BCR 2.75). In ridgegourd, application of RDF NPK @50:25:25 kg/ha, N in two splits gave higher yield and economics (99.80 q; BCR 4.28).

Farmers expressed that those farmers who are engaging own family labour would certainly carryout split application technique for nutrients. But they opined that under the present conditions, in which labour is not only scarce but also costly split application of nutrients in any crop is practically having limited scope.

(D) Integrated Disease Management

(i) Management of sigatoka leaf spot in banana: Banana is a major fruit crop in Tamil Nadu and the average productivity ranges from 200 – 300 q/ha. Sigatoka leaf spot caused by the fungus *Mycosphaerella musicola* is a major disease affecting all banana growing tracts of Tamil Nadu. In case of severe infestation, the disease causes yield and economic loss to an extent of 60-75 per cent.

KVKs at Salem, Trichirappalli and Tuticorin have assessed technologies for management of sigatoka leaf sopt in banana. Results indicated that spraying of Fosetyl Aluminium @1 g + Propiconazole @1 ml/ l realized better yield and economics in Salem (292 q/ha; BCR 3.92); Trichirappalli (421.70 q/ha; BCR 2.13) and Tuticorin (300 q/ha; BCR 1.85) as compared to spraying Mancozeb @2 g + Bavistin @2 g/l.

Farmers are satisfied with the technical feasibility and economic viability of the technology.



On farm assessment on management of sigatoka leaf spot in banana

(ii) Management of yellow vein mosaic in blackgram: Yellow vein mosaic is a serious disease in blackgram in Vellore, Ariyalur and Pudukottai districts. In case of severe infestation, the yield and economic



On farm assessment on management of yellow vein mosaic in blackgram

loss could be upto 80 per cent. Seed treatment is an important prophylactic measure recommended for the management of disease. However, in order to control the vector white fly (*Bemisia tabaci*), KVKs at Vellore, Ariyalur and Pudukottai conducted assessment for the management of the disease and the results indicated that seed treatment with Imidachloprid 70WS @5ml/kg of seed followed by foliar spray of systemic insecticide Dimethoate @750ml/ha on 30 DAS besides the removal of affected plants proved to be effective for the management of disease and realized better yield and economics at Vellore (6.65 q/ha; BCR 2.73), Ariyalur (11.50 q/ha; BCR 3.31) and Pudukottai (9.65 q/ha; BCR 2.56).

Farmers expressed full satisfaction over the performance of the technology and agreed to adopt the same in future also. They also stated that they will share the experiences with other farmers cultivating blackgram.

(E) Integrated Pest Management

(i) Management of pseudostem weevil in banana: Banana is the major small holder's fruit crop mainly cultivated as a component crop in homestead farming. The crop is cultivated in an area of 0.75 lakh ha and the average productivity of the crop is about 15-25 t/ha. Pseudostem weevil (*Odoiporus longicollis*) is an important pest infesting the crop and causes a yield and economic loss upto 60 per cent. KVK Wayanad, Calicut and Pathanamthitta assessed the technologies for the management of this pest.



On farm assessment on management of *Pseudostem weevil* in banana

The results indicated that leaf axil application of mass multiplied *Metarrhizium anisoplia* @ 100 number in 200 g of rice bran, two times at 1 month interval gave higher yield and better economics (204 q/ha; BCR 2.03) in Pathanamthitta district as compared to drenching and spraying of chlorpyrifos @1.5 ml/l plant in 5th and 6th month.

Crop protection technologies recommended for up-scaling through frontline demonstration

- Spraying of fosetyl aluminium 1 g + propiconazole 1 ml/l found to be better in control of sigatoka leaf spot in banana and gave yield of 292.00 q/ha in Salem district, 421.70 q/ha in Trichirappalli district and 300.00 q/ha in Tuticorin district of Tamil Nadu.
- Seed treatment with Imidachloprid 70WS @5ml/kg of seed followed by foliar spray of systemic insecticide Dimethoate @750ml/ha on 30 DAS besides the removal of affected plants proved to be effective for the management of Yellow Vein Mosaic in blackgram and gave yield of 6.65 q/ha in Vellore district, 11.50 q/ha in Ariyalur district and 9.65 q/ha in Pudukottai district of Tamil Nadu.
- Results on management of pseudostem weevil of banana revealed that leaf axil application of mass multiplied *Metarrhizium anisoplia* @ 100 g in 200 g of rice bran in two times at 1 month interval gave higher yield of 204.00 q/ha in Pathanamthitta whereas application of *Beauveria bassiana* 25 g/pseudo stem and placing in the ground soil @ 300 g cut stem and Chlorpyrifos 2.5ml/l with adjuvant 1ml/l swabbing on the stem gave higher yield of 198 q/ha in Wayanad district and spraying Neemazal (1%) on pseudo stem and leaf axil filling at monthly interval starting from fifth month onwards gave better yield of 211.50 q/ha in Calicut district of Kerala.

In Wayanad district, application of *Beuvaeria bassiana* @25 g/stem in the pseudo stem and placing in the ground soil and Chlorpyripos @2.5 ml/l with adjuvant 1ml/l swabbing on the stem gave higher yield and economics (198 q/ha; BCR 1.78) whereas spraying of Neemazal (1per cent) on pseudo stem and its leaf axil filling with the same dose at monthly intervals starting from fifth month onwards gave better yield and economics (211.50 q/ha; BCR 1.98) in Calicut district.

Farmers expressed happiness about the performance of the technologies for the management of pseudostem weevil of banana.

(F) Weed management

(i) Weed management in blackgram: Blackgram is the major pulse crop of Tamil Nadu cultivated in more than 10 lakh ha both under irrigated and rainfed conditions. The average yield of the crop is ranging from 5 to 7 q /ha. Weed growth is the major problem resulting in a yield and economic loss upto 30 per cent.

KVKs Ariyalur, Pudukottai and Thiruvallur assessed the technologies for the management of weeds



On farm assessment on weed management in blackgram



in blackgram. The results indicated that application of pre-emergence herbicide Pendimethalin @0.75 kg ai/ ha on 3 DAS + post emergence application of (EPOE) Imazethapyr @60 g a.i/ha on 15 DAE of weeds (2 leaf stage) gave higher yield and economics in Ariyalur (11.50 q/ha; BCR 3.31), Pudukottai (10.36 q/ha; BCR 3.13) and Thiruvallur (9.38 q/ha; BCR 2.00). Farmer's feedback indicated that subject to the easy availability of the weedicides they are much satisfied with the technology.

(G) Farm machineries

(i) Management of weeds in paddy through power weeder: Weeds are major menace in paddy cultivation both in Kerala and Tamil Nadu. Due to labour shortage, the economic loss due to weeds is higher. In order to find a solution for this problem, KVKs of Palakkad, Pathanamthitta and Alleppey in Kerala and KVKs of Nagapattinam and Karur in Tamil Nadu have assessed the performance of power weeder for weed management.

The results indicated that in all these KVKs, use of power weeder was found to be highly economical. The respective labour saving percentage and economic benefits are as follows : Palakkad (60.50, BCR 3.20), Pathanamthitta (61.56, BCR 3.34), Alleppey (57.85, BCR 3.02), Karur (63.55, BCR 2.75) and Nagapattinam (67.64, BCR 2.95).



On farm assessment on weed management in paddy through power weeder

Farmers are fully satisfied with the technology both in terms of technical feasibility and economic viability. They also opined that it should be promoted through schemes of Department of Agriculture.

(H) Nutrition management in animals

(i) Effect of Gruel Rooted Additive Nourishment Drops supplement on dairy cows: Survey in Tamil Nadu on the feeding pattern of cows revealed that about 67 per cent of the farmers are possessing low yielding cows fed on gruel based unbalanced feed. This causes deficiency of nitrogen (protein), copper, cobalt and sulphur, which are essential to support rumen microbial growth.

The major symptoms of the affected animals include, 25 to 30 per cent lesser milk yield, lameness, foul smelling dung, anoestrus and prolonged dry period.

Research efforts conducted by TANUVAS Chennai evolved Gruel Rooted Additive Nourishment Drops (GRAND), which can be used as a supplement. It contains urea, copper, cobalt and sulphur in a 20 ml sachet which costs 50 paise/sachet. This GRAND supplement recommended for cow/buffaloe to feed daily (20 ml mixed with daily gruel feed mixture per day per animal). Since the type of feed ingredients fed to dairy cows and buffaloes vary among the districts, the efficacy of GRAND supplement was to be assessed.

During the period under report, 20 KVKs in Tamil Nadu were conducted 615 OFTs on GRAND supplement and the results indicated that continuous feeding of GRAND supplement for a month @ 20 ml/cow/day, there was a consistent increase in milk yield by 500 to 700 ml/day/cow. The increase in milk yield was noticed from 7th to 10th day after GRAND supplementation, at an additional cost of only Rs. 15/month/cow. An increase of 10 litres of milk yield/month gave an additional income of Rs.180/month, besides healthy look to animals. Farmers expressed that due to



On farm assessment of GRAND supplements on dairy cows

feeding of GRAND supplement, foul smell was not noticed in the dung and they were satisfied about the technical feasibility and economic viability of the technology.

Livestock technologies recommended for up-scaling through frontline demonstrations

- Feeding of GRAND supplement for a month @ 20ml/cow/day was found to be effective for a consistent increase in milk yield by 500 to 700 ml/day/cow with good health of cow and gave an additional income of Rs. 180/month in 20 districts of Tamil Nadu.
- Providing Anthelmintic Incorporated Mineral (AIM) block for goat along with the required quantity of concentrates and roughages as feed increases body weight by 20 per cent and reduces worms upto 60 per cent .
- High density fish culture in cages proved that the technology is technically feasible and economically viable with a net return of Rs.2700/cage and BCR 1.27 in Ernakulam district of Kerala.

3.1.2 Frontline demonstrations

Frontline demonstrations (FLDs) were conducted by KVKs to demonstrate the production potential of newly released crop varieties, production technologies in crops and animal husbandry for enhancing production, productivity of crops and income generation through successful technologies and agriculture related enterprises on the farmers' fields in a given farming system. During the year, 11132 frontline demonstrations were organized of which more in vegetable crops (1499) followed by cereals (1307), hybrids (1296), millets (801), pulses (739), fruit crops (663), oilseeds (656), special pulses programme in NFSM districts (564), spice crops (514), farm implements (459), plantation crops (318), commercial crops (233), fodder crops (203), flowers

Table 15: Details of Frontline Demonstrations implemented during 2012-13

Category	Area (ha)/No.	No. of farmers
Vegetable crops	288.53	1499
Cereals	471.35	1307
Hybrids	488.70	1296
Millets	314.80	801
Pulses	288.35	739
Fruit crops	310.35	663
Oilseeds	248.33	656
Special pulses programme in NFSM districts	229.20	564
Spices	92.63	514
Farm implements	155.29	459
Plantation crops	119.40	318
Commercial crops	82.20	233
Fodder crops	49.49	203
Flowers	47.80	182
Tuber crops	24.64	110
Fibre crops	31.00	79
Medicinal crops	2.40	7
Total	3244.46	9630
Livestock (No. of animals)	5099	885
Fisheries (units)	107	123
Other enterprises (number)	196	494
Total	5402	1502
Grand Total		11251

(182), tuber crops (110), fibre crops (79) and medicinal crops (7) in an area of 3244.46 ha. Further, it also includes 1502 demonstrations on improved breeds of livestock, (5099 nos.), fisheries (107 units) and other enterprises (196 nos.) during the year (Table 15). Apart from this, a total of 2155 demonstrations were conducted by KVKs on horticulture crops (1282), pulses (282), commercial crops (216), oilseeds (116), cereals (104), fodder (100) and millets (55) which are at different stages of implementation. Details of demonstrations organised in field crops, horticulture crops and allied activities are depicted in Fig.4, 5 and 6.

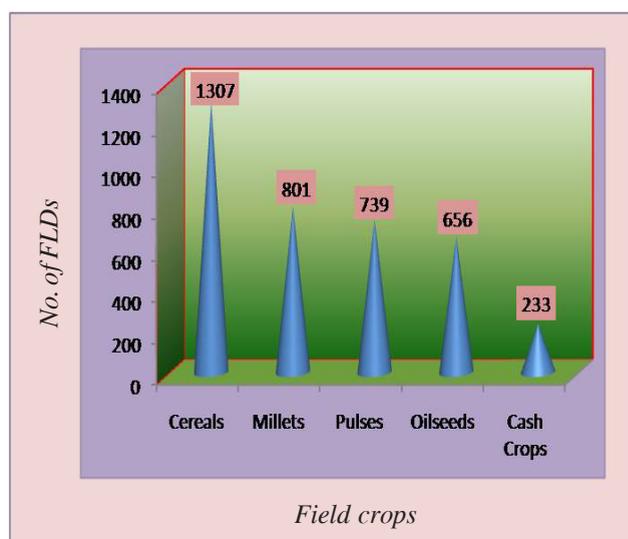


Fig. 4: Number of frontline demonstrations organized under field crops



Fig. 5: Area covered under frontline demonstrations in horticulture crops

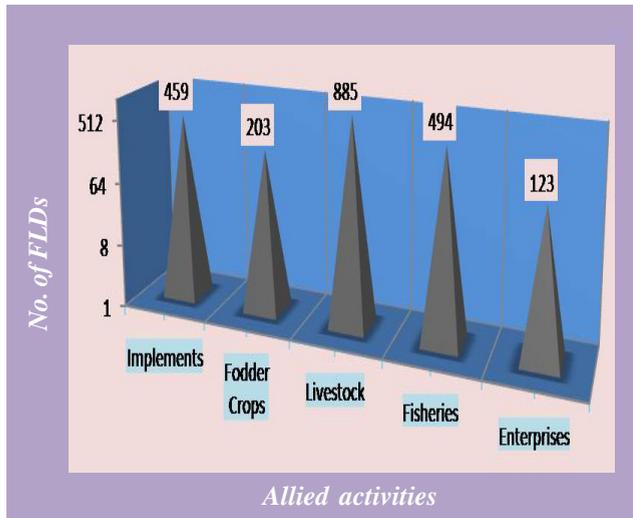


Fig. 6: Number of frontline demonstrations organized under allied activities

The crop-wise results recorded under FLDs due to various technologies and farming situation conducted in the farmers fields during 2012-13 are detailed as under:

3.1.2.1 Cereals: A total of 1307 demonstrations in 471.35 ha in major cereals like paddy, maize and wheat were conducted during the year, achieving 23.46 per cent yield increase in paddy followed by wheat (23.39 per cent) and maize (6.77 per cent) (Table 16). The BCR recorded was higher in the demonstrations as compared to their local checks and ranged from 2.36 in paddy to 3.11 in wheat. Average yield obtained was high in paddy (52.90 q/ha) followed by maize (38.74 q/ha) and wheat (31.18 q/ha) as compared to 43.56, 36.28, and 22.82 q/ha, respectively in their local checks. Technologies such as SRI, INM, IPM and varieties introduction in paddy, ICM in maize, promotion of improved variety and ICM in wheat have led to impressive yield gains as compared to farmers practice both under irrigated and rainfed/upland conditions.

Table 16: Performance of frontline demonstrations in cereals

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Paddy	1164	414.35	52.90	43.56	23.46	2.36	1.87
Wheat	117	45.60	31.18	22.82	23.39	3.11	1.79
Maize	26	11.40	38.74	36.28	6.77	2.51	2.33
Total	1307	471.35					

Cereals

Improved technologies in paddy were demonstrated during the year in 414.35 ha in Karnataka, Tamil Nadu, Kerala, Puducherry and Goa covering rainfed, upland and irrigated conditions. The average yield recorded due to improved technology/variety under irrigation was 59.85 q/ha in Karnataka, 56.68 q/ha in Tamil Nadu, 43.06 q/ha in Kerala and 39.0 q/ha in Puducherry as against the state average of 27.16, 30.78, 25.47 and 25.04 q/ha, respectively. In case of wheat, 117 demonstrations conducted in Karnataka and Tamil Nadu have revealed an average yield of 32.54 q/ha in Karnataka and 29.89 q/ha in Tamil Nadu under irrigation as against the state average of 9.65 q/ha for Karnataka. These FLDs have resulted in substantial gains to farmers and also helped in great way to enhance the national production. These technologies, if adopted on a large scale by the farmers of these states, will lead to substantial increase in production of cereal grains in the country.



Frontline demonstration on maize

3.1.2.2 Millets: A total of 801 demonstrations in millet crops like bajra, finger millet, sorghum, little millet, foxtail millet and barnyard millet were undertaken in 314.8 ha area to demonstrate ICM, INM and improved varieties mostly as rainfed crops (Table 17). The per cent yield increase was 34.72 in bajra followed by finger millet (25.19), foxtail millet (23.31), little millet (22.79) and sorghum (21.78). The BCR was found to be 2.53 in bajra, 2.36 in finger millet, 2.62 in foxtail millet, 2.45 in little millet and 2.93 in sorghum under demonstration which were substantially higher as compared to check.

3.1.2.3 Oilseeds: During the year, 656 frontline demonstrations were conducted in major oilseed crops like groundnut, sesamum, castor, soybean, sunflower

Table 17: Performance of frontline demonstrations in millets

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Finger millet	415	152.20	21.48	17.73	25.19	2.36	2.02
Sorghum	130	51.00	13.00	12.16	21.78	2.93	2.60
Foxtail millet	85	34.00	12.28	7.27	23.31	2.62	1.64
Bajra	55	32.00	14.08	10.27	34.72	2.53	2.03
Little millet	40	14.00	6.20	5.06	22.79	2.45	2.13
Rabi sorghum	37	15.00	11.35	9.67	17.14	1.27	1.09
Barnyard millet	29	11.60	6.30	5.80	8.62	1.24	1.54
Sorghum seed	10	5.00	31.00	28.00	10.71	2.40	2.21
Total	801	314.80					



Frontline demonstration on bajra



Frontline demonstration on finger millet

Table 18: Performance of frontline demonstrations in oilseeds

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Groundnut	443	150.90	20.91	16.88	25.94	2.95	2.44
Sesamum	121	55.40	5.00	4.04	22.95	2.78	2.40
Castor	45	17.00	13.29	9.71	38.05	3.60	2.46
Soybean	34	15.03	12.31	10.30	18.61	2.09	1.81
Safflower	8	5.00	3.90	2.00	95.00	1.72	1.20
Sunflower	5	5.00	9.13	7.25	25.93	1.76	1.69
Total	656	248.33					

and safflower covering an area of 248.33 ha in farmers' field conditions (Table 18). Increase in yield varied from 95 per cent in safflower to 18.61 per cent in soybean as compared to check. The BCR under improved technology demonstration was higher than check and the same ranged from 1.72 in safflower to 3.60 in castor as against 1.20 in safflower to 2.46 in castor under check plot. The technologies such as ICM, new variety introduction, INM and location specific cropping systems performed superior over farmers practices in oilseeds.

Oilseeds

Among oilseed crops demonstrated, groundnut technologies performed impressively in Karnataka by recording an average yield of 18.26 q/ha as against the state average of only 8.36 q/ha. In soybean, the yield recorded under technology demonstration was 12.31 q/ha in Karnataka as compared to state average of 8.51 q/ha. These results have clearly demonstrated the existing potentials of oilseed crops under improved technology and variety in the states of Karnataka and Tamil Nadu. Hence, these district specific technologies demonstrated by the KVKs need to be up scaled for their adoption by the farmers through the concerned line departments under the ongoing schemes of State and Central Governments.

3.1.2.4 Pulses: During the year, 739 frontline demonstrations in major pulses like blackgram,



Frontline demonstration on groundnut

pigeonpea, chickpea, greengram, fieldbean, horsegram and cowpea were conducted covering an area of 288.35 ha (Table 19). The percentage increase in yield varied from 36.96 in pigeonpea to 9.07 in fieldbean under various technology demonstrations as against check. The BCR recorded with technology demonstration was higher in all pulse crops as compared to their local checks and ranged from 1.98 in cowpea to 3.85 in chickpea. The significant technologies emerged out of these FLDs were introduction of improved varieties, ICM and IPM in pulses.



Frontline demonstration on chickpea



Table 19: Performance of frontline demonstrations in pulses

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Blackgram	262	104.50	8.38	6.59	29.46	2.46	2.09
Pigeonpea	222	83.50	11.72	8.96	36.96	3.05	2.55
Chickpea	127	54.80	12.83	10.05	27.46	3.85	3.00
Greengram	94	35.00	8.36	6.23	26.42	2.42	1.90
Fieldbean	15	5.00	9.74	8.93	9.07	2.91	2.89
Horsegram	10	4.00	5.82	4.32	34.72	2.62	1.77
Cowpea	9	1.55	9.35	8.36	11.84	1.98	1.76
Total	739	288.35					

Table 20: Performance of frontline demonstrations in commercial and fibre crops

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Sugarcane	105	36.00	375.82	260.09	30.82	3.91	2.74
Mulberry	61	21.00	106.94	97.93	17.15	2.46	1.87
Betelvine	47	15.20	187.89	137.29	37.08	2.32	2.00
Coffee	20	10.00	27.18	23.50	15.66	2.38	2.27
Total	233	82.20					
Cotton	79	31.00	17.97	15.20	31.06	2.19	1.78
Total	79	31.00					

Pulses

The FLDs conducted during the year in Karnataka and Tamil Nadu have clearly demonstrated the higher yield potentials of pulse crops than what is achieved by the states. The average yield achieved due to technology demonstration was 12.83 q/ha in chickpea in Karnataka as compared to state average of only 6.26 q/ha. Similarly, in pigeon pea, the yield recorded under FLDs was 12.07 q/ha in Karnataka and 10.51 q/ha in Tamil Nadu as against the state average of 5.71 q/ha for Karnataka and 6.29 q/ha for Tamil Nadu. Hence, these district specific technologies have great potential to impress the farmers to go for pulses cultivation provided technological inputs are made available to them at right time and right quality.

3.1.2.5 Commercial and fibre crops: A total of 233 frontline demonstrations were conducted in commercial crops like sugarcane (105), mulberry (61), betelvine (47) and coffee (20) in an area of 82.20 ha during the year. The yield increase in FLDs was 15.66 per cent in coffee, 17.15 per cent in mulberry, 30.82 per cent in sugarcane and 37.08 per cent in betelvine as compared to local check in the respective crops (Table 20). The BCR under demonstrations ranged from 2.32 in betelvine to 3.91 in sugarcane. Similarly in fibre crop cotton, 79 frontline demonstrations were organized in farmers fields of 31.00 ha to demonstrate the improved technologies like ICM, IPM, Bt technology and balanced nutrition. The overall increase under demonstration was 31.06 per cent as against check plots. The BCR was 2.19 in demonstration plot as compared to 1.78 in local check. Among the technologies, INM, resource conservation and ICM in sugarcane and improved variety; IPM and ICM in cotton have given impressive gains in yield and economic returns as compared to farmers practices. In coffee, IPM technology demonstration resulted in higher yields and economic returns.



Frontline demonstration on cotton

3.1.2.6 Fodder crops: In fodder crops, 203 demonstrations were conducted during the year covering an area of 49.49 ha. The fodder yield increase was in the range of 11.11 per cent in mixed fodder crops to 66.67 per cent in stylo under FLDs as compared to local check (Table 21). The BCR ranged from 0.55 in fodder bank demonstration to 3.34 in bajra napier demonstration. The introduction of improved varieties of fodder crops have given higher benefits to farmers in terms of forage yield and returns as against locals both under rainfed and irrigated conditions.

Table 21: Performance of frontline demonstrations in fodder crops

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Fodder sorghum	60	17.25	1688.64	524.86	11.24	2.91	2.37
Bajra napier	38	4.20	736.19	438.33	39.83	3.34	1.67
Stylo	25	5.00	250.00	150.00	66.67	2.92	2.44
Guinea grass	15	5.04	959.52	709.09	35.56	2.20	1.55
Fodder bank	20	4.00	57.81	-	-	0.55	-
Mixed fodder crops	10	2.00	3.00	2.70	11.11	1.81	1.40
Fodder bajra	10	1.00	3438.00	2540.00	35.35	2.67	2.13
Fodder maize	10	4.00	34.00	-	-	2.44	-
Lucerne	5	1.00	447.50	-	-	2.73	-
Azolla	5	5.00	5.00	4.40	13.64	2.25	1.85
Fodder cowpea	5	1.00	220.00	-	-	1.39	-
Total	203	49.49					

3.1.2.7 Vegetable crops: A total of 1499 demonstrations on various vegetables comprising tomato, cucumber, french bean, bitter gourd, snake gourd, bhendi, brinjal, onion, cabbage, cauliflower, carrot, vegetable cowpea, dolichos, mixed vegetables, yard long bean, pea, drumstick, amaranthus, beet root, pole bean etc were conducted in 288.53 ha area during the year. The yield increase recorded under FLDs as compared to check ranged from 6.90 per cent in cauliflower to 82.50 per cent in bittergourd (Table 22). The BCR was also higher with technology demonstration as compared to check in all the vegetables demonstrated. In general, ICM, INM, IPM combined with improved varieties demonstrated through FLDs have resulted in higher gains in terms of yield and economic returns to farmers.

3.1.2.8 Tuber crops: In tuber crops, 110 demonstrations on crops like elephant footyam, tapioca and potato were conducted in 24.64 ha area. The yield increase recorded under FLDs as compared to check was 33.28 per cent in tapioca, 29.25 per cent in potato and 22.36 per cent in elephant footyam (Table 23). The BCR was higher in potato, recording 5.24 under rainfed and 3.44 under irrigation followed by 2.57 in tapioca under rainfed and 3.98 under irrigation and 2.32 in elephant footyam. Improved variety, ICM and IPM in tapioca, ICM in elephant footyam, and INM and IPM in potato have emerged as frontline technologies for enhancing the yield and production in tuber crops.

3.1.2.9 Fruit crops: A total of 663 demonstrations on various fruit crops like banana, mango, watermelon,



Table 22: Performance of frontline demonstrations in vegetable crops

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Bittergourd	353	26.65	516.37	241.50	82.50	2.76	1.79
Onion	162	54.95	174.81	139.96	25.57	3.62	2.64
Frenchbean	80	30.70	126.43	92.87	33.16	3.34	2.42
Tomato	80	15.34	477.29	361.13	30.41	2.72	2.19
Cowpea	74	15.68	201.39	143.26	45.10	2.34	1.62
Mixed vegetables	72	7.10	249.51	201.90	25.70	3.29	2.97
Carrot	72	4.52	126.14	-	-	1.03	-
Brinjal	70	15.20	313.58	272.08	16.33	3.25	2.63
Cabbage	65	6.40	75.02	62.95	15.88	2.31	2.25
Vegetable cowpea	52	18.00	139.58	97.78	38.81	2.57	2.15
Cucumber	50	5.00	56.00	32.00	75.00	1.42	1.18
Radish	50	0.20	387.50	-	-	1.67	-
Chilli green	45	14.04	89.76	85.69	25.75	4.26	3.06
Amaranthus	43	9.80	296.94	195.10	65.35	2.75	1.80
Drumstick	37	17.00	146.97	123.17	24.31	2.20	1.78
Snakegourd	30	7.00	249.63	195.93	26.29	3.39	2.79
Lettuce	21	3.75	180.00	160.00	12.50	2.21	2.05
Cauliflower	20	5.00	176.20	139.20	6.90	3.95	3.68
Dolichos bean	20	7.00	84.83	57.26	56.33	2.97	2.53
Field bean	20	6.00	63.13	55.37	11.81	3.64	3.21
Pea	20	4.00	68.85	51.25	34.34	3.03	2.24
Bhendi	18	3.20	226.00	190	18.95	1.47	1.26
Babycorn	15	6.00	136.13	107.25	26.93	2.07	1.46
Drumstick seed	10	1.00	25.00	16.00	56.25	2.30	1.87
Onion small	10	4.00	13.40	9.20	45.65	5.85	3.57
Ridgegourd	10	1.00	143.50	115.00	24.78	2.87	2.46
Total	1499	288.53					

Table 23: Performance of frontline demonstrations in tuber crops

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Potato (rainfed)	47	16.00	54.91	42.90	29.25	5.24	4.32
Potato (irrigated)	5	2.50	108.00	88.50	22.03	3.44	2.72
Tapioca (rainfed)	43	6.00	138.02	107.59	33.28	2.57	1.79
Tapioca (irrigated)	5	0.10	321.95	251.76	27.88	3.98	2.80
Elephant footyam	10	0.04	475.00	368.80	22.36	2.32	1.48
Total	110	24.64					

sweet orange, pineapple, citrus, lime, grapes, pomegranate and sapota were conducted in 310.35 ha area (Table 24). The percentage yield increase recorded as compared to check was 42.19 in mango followed by pineapple (39.67), sweet orange (36.03), watermelon (30.10), banana (21.61), grapes (20.47), lime (20.06), pomegranate (15.85) and sapota (12.85) thereby recording higher BCR of 3.44, 2.57, 3.19, 2.32, 3.07, 5.07, 2.67, 4.28 and 3.97, respectively as compared to local checks. Among fruit crop technologies demonstrated, ICM, IDM, IPM and INM in banana, IPM in grapes, IDM in lime, ICM, INM and integrated management of fruit fly in mango, and ICM in watermelon with improved varieties have indicated better yield and economic returns.

3.1.2.10 Spice crops: In spices, a total of 514 demonstrations were conducted on dry chillies, ginger, black pepper, turmeric and coriander seed in an area of 92.63 ha (Table 25). The per cent yield increase recorded as compared to check was 51.02 in black pepper followed by dry chillies (38.52), ginger (31.42), turmeric (22.03) and coriander (12.21) leading to higher BCR of 3.44, 2.08, 2.53, 4.02 and 3.00, respectively as compared to their local checks. Demonstrated technologies such as quick wilt and foot rot management in black pepper, management of rhizome rot in ginger and turmeric, ICM and IPM in dry chillies, resource conservation technology in coriander have been found worthy for up-scaling in Karnataka, Tamil Nadu and Kerala.

Table 24: Performance of frontline demonstrations in fruit crops

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Banana	362	80.65	401.74	339.09	21.61	3.07	2.54
Mango	177	93.00	95.09	67.29	42.19	3.44	2.51
Watermelon	37	10.00	257.04	189.21	30.10	2.32	1.94
Sweet orange	28	8.20	174.76	131.16	36.03	3.19	2.69
Pineapple	15	2.50	512.00	372.00	39.67	2.57	2.19
Citrus	12	5.00	207.80	173.00	20.12	5.57	4.47
Lime	12	5.00	199.09	165.83	20.06	2.67	2.08
Grapes	10	4.00	235.25	197.30	20.47	5.07	3.71
Pomegranate	5	2.00	66.28	57.21	15.85	4.28	2.60
Sapota	5	100.00	57.10	50.60	12.85	3.97	2.87
Total	663	310.35					

Table 25: Performance of frontline demonstrations in spice crops

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Chilli dry	267	43.00	14.24	11.41	38.52	2.08	1.62
Ginger	101	11.91	161.37	123.99	31.42	2.53	1.97
Blackpepper	81	21.22	74.79	54.70	51.02	3.44	2.47
Turmeric	55	9.50	121.34	100.62	22.03	4.02	2.97
Coriander seed	10	7.00	4.50	4.07	12.21	3.00	2.55
Total	514	92.63					



3.1.2.11 Plantation crops: A total of 318 demonstrations on plantation crops like arecanut, coconut, cashew and tea were conducted in 119.4 ha area (Table 26). The per cent yield increase recorded in demonstrations as compared to check was 52.64 per cent in cashew followed by coconut (26.85), arecanut (28.48) and tea (12.25) with BCR of 3.19, 1.75, 3.31 and 1.93, respectively was recorded in demonstrations as compared to their local checks. Technologies such as management of tea mosquito bug, root and stem borer in cashew, INM, IPM and IDM in arecanut, IPM, ICM and IFS in coconut gardens, and INM in tea have impressed the farmers with their higher yield and returns.

3.1.2.12 Flower and medicinal crops: During the year, 182 demonstrations on flower crops like jasmine, chrysanthemum, aster, tuberose and marigold were conducted in 47.80 ha area (Table 27). The per cent yield increase recorded under FLDs as compared to

check was high 35.86 in tuberose followed by chrysanthemum (32.06), jasmine (22.23), marigold (16.44) and aster (14.30) with higher BCR of 2.18, 2.58, 3.15, 5.99 and 3.93, respectively as compared to their local checks. Adoption of improved variety with improved crop management practices in aster and chrysanthemum, IPDM in jasmine and IPM in tuberose have emerged as frontier technologies for up-scaling flower production. In medicinal crops, variety introduction and ICM in velvetbean and rosemary have performed to the satisfaction of farmers with higher yield and economic returns.

3.1.2.13 Hybrids: During the year, 1413 demonstrations on hybrids in various crops were conducted covering 510.70 ha area on cereals and millets (paddy, maize, sorghum, bajra), oilseeds (sunflower, castor), fibre crops (cotton) and vegetables (baby corn, chilli, bhendi, brinjal, cabbage, cauliflower, tomato, bittergourd, onion, capsicum and watermelon).

Table 26: Performance of frontline demonstrations in plantation crops

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Arecanut	105	30.00	19.52	15.44	28.48	3.31	2.68
Coconut (nuts/ha)	162	70.00	11945	9712	26.85	1.75	1.49
Cashew	42	17.00	9.59	6.14	52.64	3.19	2.08
Tea	9	2.40	123.08	103.06	12.25	1.93	1.32
Total	318	119.40					

Table 27: Performance of frontline demonstrations in flower and medicinal crops

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Jasmine	85	18.40	59.30	48.27	22.23	3.15	2.65
Chrysanthemum	40	6.00	111.55	84.83	32.06	2.58	2.32
Aster	22	5.40	35.69	21.06	14.30	3.93	2.63
Tuberose	20	8.00	83.25	67.00	35.86	2.18	1.96
Marigold	15	10.00	51.16	43.94	16.44	5.99	4.25
Total	182	47.80					
Velvetbean	5	2.00	64.00	47.00	36.17	1.36	1.05
Rosemary	2	0.40	120.00	84.00	42.86	1.92	1.40
Total	7	2.40					

The hybrids demonstrated have clearly out yielded local checks in all the crops during the year (Table 28).

The percentage yield increase in demonstration plots in case of cereals and millets was 21.19 in paddy, 16.87 in maize, 23.26 in sorghum and 38.12 in bajra as compared to check. In oilseeds, castor hybrids recorded yield increase of 40.39 per cent followed by sunflower hybrids with 18.05 per cent. In case of cotton, the yield increase achieved with hybrids was 23.35 per cent.

Among vegetable hybrids, the yield increase ranged

from 3.88 per cent in cauliflower to as high as 30.61 per cent in watermelon. The cost benefit ratio was also higher in all vegetable hybrids as compared to their local checks.

3.1.2.14 Livestock and fisheries: During the period under report, 1008 demonstrations were conducted on dairy cow, dairy buffaloes, poultry, duckery, sheep and goat, piggery and fisheries and the details are presented in Table 29. During the year, 5099 improved breeds of animals were provided through KVKs and 107 units of fisheries were demonstrated for the benefit of farmers.

Table 28: Performance of frontline demonstrations in hybrids

Crop	Hybrids	No. of Demo.	Area (ha)	Yield (q/ha)		Yield increase %	BCR	
				Demo.	Check		Demo.	Check
Cereals								
Paddy (irrigated)	KRH-4	25	5.00	52.24	43.32	21.30	2.52	2.00
	CORH-5	25	17.00	57.66	47.55	21.61	1.90	1.70
	Korakanth-509	12	5.00	100.50	84.00	19.64	2.60	2.24
Total		62	27.00	64.59	53.52	21.19	2.14	1.86
Maize (irrigated)	CP-819	48	22.00	68.50	59.60	15.24	4.16	4.10
	M 900	25	10.00	58.50	50.10	16.77	3.78	3.49
	Super 900-M gold	20	8.00	30.12	23.27	29.44	2.20	1.92
Maize (rainfed)	NAH-1137	67	31.20	55.82	51.20	9.76	3.05	2.77
	NAH-2049	50	20.00	45.00	40.00	12.50	3.34	2.97
	M 900	10	4.00	16.25	11.00	47.73	1.83	1.33
Total		220	95.20	56.02	49.04	16.87	3.31	3.03
Total cereals		282	122.20					
Millets								
Bajra (irrigated)	Co 9	22	9.00	25.70	19.16	36.53	2.86	1.64
Bajra (rainfed)	Pioneer 86 M 52	25	10.00	16.57	12.49	32.67	1.81	1.25
	Varada	20	8.00	16.25	11.00	47.73	1.83	1.33
Co 9	15	6.00	8.33	6.17	31.67	2.04	1.45	
Total		82	33.00	19.77	14.51	38.12	2.15	1.41
Sorghum (irrigated)	Pioneer 8201	20	8.00	55.38	50.76	9.10	3.78	3.13
	Co 6	22	10.00	30.40	24.30	27.09	3.20	2.41
	Co 5	10	4.00	30.50	20.80	46.63	2.35	2.11
Sorghum (rainfed)	CSH-14	13	5.00	8.49	7.10	19.58	1.93	1.53
Total		65	27.00	33.76	28.44	23.26	3.01	2.42
Total millets		147	60.00					

Contd....33....



Crop	Hybrids	No. of Demo.	Area (ha)	Yield (q/ha)		Yield increase %	BCR	
				Demo.	Check		Demo.	Check
Oilseeds								
Castor (rainfed)	DCH-178	30	14.00	9.86	8.82	11.40	2.38	2.42
	YRCH2	37	7.40	19.16	9.43	100.59	3.11	1.85
Castor (irrigated)	YRCH1	35	14.00	27.50	20.28	37.55	2.78	2.05
Total		102	35.40	18.78	13.48	40.39	2.69	2.15
Sunflower (rainfed)	KBSH-54	60	24.00	9.70	8.19	18.34	2.65	2.13
	Ganga Kaveri 202	12	5.00	12.19	9.80	24.39	3.20	2.41
	Co 2	15	6.00	8.90	8.00	11.25	1.71	1.45
Sunflower (irrigated)	Co 2	10	2.00	19.35	16.25	19.08	2.38	2.02
Total		97	37.00	10.43	8.81	18.05	2.56	2.05
Total oilseeds		199	72.40					
Fiber crop								
Cotton (irrigated)	Bt.cotton (Kaveri)	40	16.00	24.04	19.95	20.80	3.92	3.02
	RAS 708	15	5.00	30.00	22.50	33.33	1.60	1.29
	BunnyBt & Sumangala	10	4.00	7.00	4.45	57.30	1.58	1.33
Cotton (rainfed)	Kanaka	72	29.00	15.33	11.95	28.87	3.22	2.83
	MRC 6918	26	10.20	17.46	15.49	12.50	2.38	2.19
	RCH 20 Bt	25	10.00	16.29	14.18	14.88	2.23	1.86
	Kanaka & Dr.Brent	10	4.00	13.75	11.70	17.52	1.50	1.30
	RCH 2 BG II (Bt cotton)	32	12.00	16.32	14.35	16.18	1.74	1.45
Total		230	90.20	17.73	14.58	23.35	2.70	2.28
Vegetables								
Baby corn (irrigated)	G-5414	10	2.00	60.00	0.00	-	2.81	-
Bittergourd (irrigated)	Amman Shri	10	4.00	38.66	30.57	26.46	2.25	1.58
	NS 421	10	2.00	7.68	6.49	18.34	4.23	3.80
	CoBGH1	10	1.00	445.20	326.40	36.40	2.66	2.02
Total		30	7.00	87.89	65.95	25.56	2.87	2.28
Brinjal (irrigated)	Mahyco 10	12	5.00	424.00	385.21	10.07	8.49	7.22
	MEH-11	8	3.20	335.00	320.00	4.69	2.71	2.12
	Arka Anand	6	1.00	202.00	185.00	9.19	3.55	2.96
	Ujala	25	10.00	263.00	256.00	2.73	1.86	1.69
Total		51	19.20	313.75	296.62	5.30	3.82	3.27
Cabbage (irrigated)	Saint	10	2.00	18.70	15.60	19.87	2.06	1.89
	Unnati	5	2.00	163.00	132.00	23.48	2.29	2.16
Total		15	4.00	90.85	73.80	21.68	2.18	2.03
Capsicum (irrigated)	Indra	10	0.40	100.00	-	-	3.91	-
Cauliflower (irrigated)	Basant	5	2.00	18.48	17.77	4.00	3.17	2.89
	NS 555	5	2.00	7.75	7.47	3.75	3.92	3.41
Total		10	4.00	13.12	12.62	3.88	3.55	3.15

Contd....34....

Crop	Hybrids	No. of Demo.	Area (ha)	Yield (q/ha)		Yield increase %	BCR	
				Demo.	Check		Demo.	Check
Chilli green (irrigated)	Sitara	12	5.00	275.00	244.23	12.60	3.14	2.48
	Sitara	5	2.00	123.50	96.20	28.38	3.04	1.88
	CO (CH) 1	65	14.00	239.23	176.76	34.30	3.28	2.41
	Arka Meghana	15	3.00	198.21	174.45	13.62	2.77	2.37
Chilli green (rainfed)	Arka Meghana	20	4.00	229.75	202.00	14.35	3.21	2.54
Total		117	28.00	231.60	186.41	24.94	3.17	2.40
Bhendi (irrigated)	Mahyco 55	12	5.00	126.00	115.00	9.57	10.08	7.19
	COBH 1	20	9.00	159.89	118.89	31.67	4.00	3.03
	CoBH-2	10	2.00	220.00	180.00	22.22	4.40	3.60
	Sakthi	10	5.00	156.00	140.20	11.27	3.02	2.75
	Mahyco 10 & Sakthi	10	4.00	125.80	119.30	5.45	1.18	1.08
Total		62	25.00	151.69	127.33	18.22	4.60	3.54
Onion (irrigated)	Royal selection	5	0.80	65.00	52.00	25.00	3.00	1.94
Total		5	0.80	65.00	52.00	25.00	3.00	1.94
Tomato (irrigated)	Arka Rakshak	27	7.50	408.87	328.27	24.83	2.83	2.45
	Arka Ananya	25	5.00	323.40	242.72	33.15	2.87	2.32
	US-618, US-1197	22	8.80	547.41	519.86	5.23	2.25	1.96
	US618	22	9.00	729.11	570.49	28.06	3.97	3.14
	Laxmi	20	6.00	327.47	289.17	13.64	2.31	1.94
	Arka Samrat	16	3.20	224.26	134.87	66.28	2.49	1.61
	NS 501	10	2.00	66.75	60.20	10.88	3.81	3.44
	Avinash	10	4.00	268.00	205.00	30.73	3.18	2.30
Total		152	45.50	438.48	362.46	23.94	2.93	2.38
Watermelon (irrigated)	Sugar Queen	10	4.00	420.50	370.40	13.53	2.84	2.55
	Ramya	10	2.00	353.00	274.00	28.83	3.10	2.65
Watermelon (rainfed)	MHW 6	10	2.00	188.65	113.27	66.55	3.12	2.37
Total		30	8.00	345.66	282.02	30.61	2.98	2.53
Total vegetables		497	145.90					
Grand total		1413	510.70					

Table 29: Details of frontline demonstrations in livestock and fisheries

Category	No. of farmers	Number
Dairy cow	541	817
Dairy buffaloes	50	50
Poultry	168	3232
Duckery	10	200
Sheep and goat	74	485
Piggery	42	315
Fisheries	123	107 (units)
Total	1008	5099



Frontline demonstration on turkey birds

3.1.2.15 Other enterprises: 196 demonstrations were organized on other enterprises such as apiary, sericulture, mushroom, value addition in crops, nutrition garden, vermi composting units etc. involving 494 farmers for income generation by the KVKs during the year. The details of production and economics are presented in Table 30.

3.1.2.16 Farm implements and tools: Farm mechanization was popularized through 439 demonstrations of various farm implements covering an area of 155.29 ha and the details are presented in Table 31. Further, chaff cutter and vivek husk stove were popularised by establishing twenty units (10 each).



Frontline demonstration on paddy transplanter

Table 30: Details of frontline demonstrations in enterprises

Category	No. of farmers	No. of units	Net returns of demo (Rs./unit/year)	BCR (Demo)
Mushroom cultivation	270	91	58619.33	3.42
Sericulture	91	9	60232.00	3.15
Value addition	65	28	68544.75	2.35
Vermicomposting	34	16	8716.67	3.64
Apiary	28	46	2812.50	2.75
IFS models	3	3	96200.00	2.66
Nutrition garden	3	3	5672.00	1.93
Total	494	196		

Table 31: Details of frontline demonstrations in farm implements and tools

Farm implement and tool	No. of farmers	Area (ha)
Full mechanization in paddy	94	30.00
Spiral separator	32	13.00
Combined harvester	29	4.50
Groundnut decorticator	28	32.50
Paddy transplanter	25	5.50
Conoweeder	20	5.00
Cycle weeder	20	3.60
Drum seeder	20	6.00
Hand gloves for Bengalgram harvesting	20	2.00
Mini mechanical carrot cleaning machine	20	2.00
CTCRI cassava harvester	10	2.00
Mango harvester	10	4.00
Mango pruning shears	10	4.00
Mechanization in maize	10	4.00
Mechanized cotton picker	10	4.00
Mechanized paddy transplanter	10	5.00
Pepper thresher	10	2.00
Power tiller	10	2.50
Turmeric boiler	10	0.04
Solar tunnel dehydrator for drying chilli	10	4.00
CRIDA vegetable preservator	5	9.00
High volume sprayer in tea plantation	5	5.00
String standard pseudostem support	5	0.15
Hand operated pigeonpea dibbler	4	1.60
Furrow former	3	0.25
Mini auger in high density planting of banana	3	0.25
Hand operated green leaf tea shears	2	0.40
Manual tea harvesting	2	1.00
Post hole digger	2	2.00
Total	439	155.29
Chaff cutter	10	10 units
Vivek rice husk stove	10	10 units
Total	20	20 units

3.1.3 Capacity development

Data in Table 32 indicates that a total of 409686 participants got benefited through 11433 training courses organized by the KVKs. Out of 11433 courses, 5560 courses were organized by 30 KVKs of Tamil Nadu, 3262 courses by 31 KVKs of Karnataka and 2299 courses by 14 KVKs of Kerala. Two KVKs each in Puducherry and Goa conducted 216 and 96 training courses, respectively. Seventy four per cent of these courses (8446) were organized to meet the needs of farmers/farmwomen/rural youth and extension functionaries. KVKs organized 394 vocational training courses benefitting 10495 participants, mostly the rural youth including young women. Besides these need based courses, KVKs organized 2593 sponsored courses for 100219 participants. State-wise number of courses and the participants in these different categories of training are also given in Table 32. State-wise percentage distribution of courses is given in Fig 7.

In terms of participation, KVKs of Tamil Nadu accounted for 49.6 per cent of participants whereas KVKs of Karnataka accounted for about 30.32 per cent of participants. State wise distribution of number of participants and the share of each state in terms of percentage are given in Fig.8.

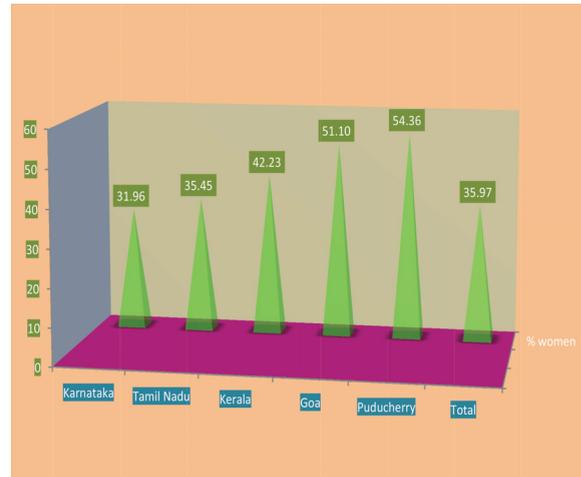


Fig 9. Percentage of women participants in different states

Out of 409686 participants, 35.97 per cent were women and the state-wise break-up is indicated in Fig 9. The two smaller states of the Zone viz. Puducherry and Goa had better women participation. Puducherry had maximum representation with 54.36 per cent and Goa was second with 51.1 per cent women participants. In other states, the percentage of women participants ranged from 31.96 per cent (Karnataka) to 42.23 per cent (Kerala).

Overall participation of SC and ST community was 19.93 per cent and the state wise percentage is

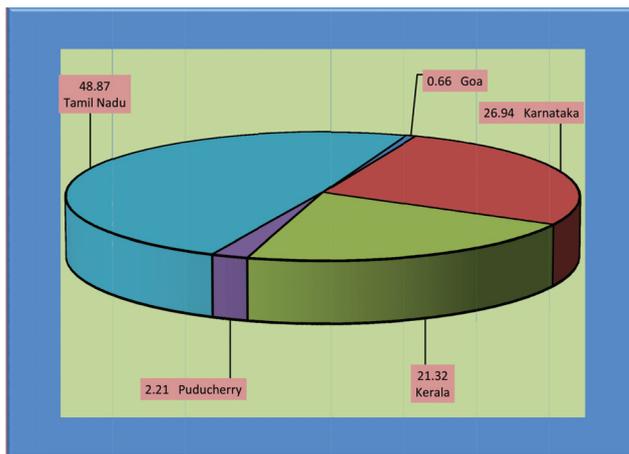


Fig 7. Percentage share of training courses in different States of the Zone

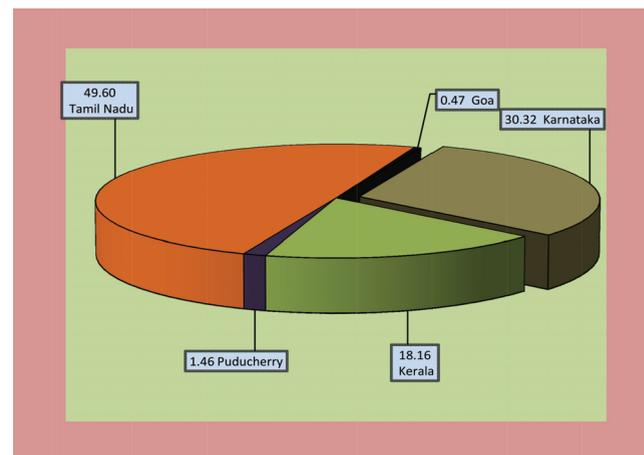


Fig 8: Percentage share of participants in different States of the Zone

Table 32: Details of training courses organized by the KVKs of Zone VIII

State /UT	No. of KVKs	Need based training Courses		Sponsored training courses		Vocational training Courses		Total	
		No. of courses	No. of participants	No. of courses	No. of participants	No. of courses	No. of participants	No. of courses	No. of participants
Karnataka	31	2466	91341	716	30663	80	2194	3262	124198
Tamil Nadu	30	4289	155039	1097	42889	174	5271	5560	203199
Kerala	14	1437	46154	730	25366	132	2878	2299	74398
Puducherry	2	163	4633	48	1251	5	95	216	5979
Goa	2	91	1805	2	50	3	57	96	1912
Total	79	8446	298972	2593	100219	394	10495	11433	409686

depicted in Fig.10. The percentage of SC/ST participants was maximum (37.34 per cent) in Goa. In other states, it ranged from 14.63 per cent in Kerala to 33.73 per cent in Puducherry.

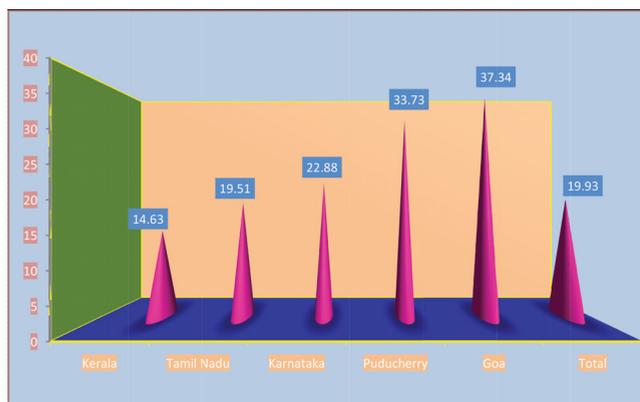


Fig 10. Percentage of SC/ST participants in different states

The details of the training courses organized by the KVKs covered 17 major training areas given in Table 33. Most number of training courses were in the area of crop production (2706) followed by livestock production and management (1259) and horticulture (1201). In terms of participation also, crop production attracted better participation (91178 participants), followed by livestock production and management which involved 52299 participants.

The data available in Table 33 also indicates that the participation of SC/ST community in different training areas was highest in the area of crop production (15786). Participation of women was highest in the area of livestock production and management (26998).

3.1.3.1 Training courses for farmers and farm women

A total of 7100 courses were organized for farmers and farm women by the KVKs during the period under report, which involved 254336 participants (Table 34). Maximum of 3623 courses were organized in Tamil Nadu followed by 2199 courses in Karnataka, 1078 courses in Kerala, 129 courses in Puducherry and 71 courses in Goa. These courses involved 167619 men and 86717 women as participants. The state-wise participation of SC/ST community and farm women reveals the fact that Tamil Nadu had better participation of SC/ST (27598 out of 53449 participants) as well as women participants (48264 out of 86717 women participants).



Farmers training on seed treatment at KVK Gadag

Training courses for farmers/farm women category were organized in the 17 major areas related to agriculture and allied sectors, the details of which

Table 33 : Details of training area wise courses, total number of participants and their distribution in terms of gender and SC/ST category

Training area	No. of courses	General			SC/ST			Total		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Crop production	2706	59103	16289	75392	10712	5074	15786	69815	21363	91178
Livestock production and management	1259	20350	17781	38131	4951	9217	14168	25301	26998	52299
Horticulture	1201	25296	10291	35587	4589	2966	7555	29885	13257	43142
Plant protection	1097	23917	6875	30792	5167	1872	7039	29084	8747	37831
Processing and value addition	951	11335	15935	27270	2643	4039	6682	13978	19974	33952
Entrepreneurship development	863	13471	8746	22217	2459	2057	4516	15930	10803	26733
Soil health and fertility management	628	19502	4976	24478	2878	1314	4192	22380	6290	28670
Production of inputs at site	538	10977	3806	14783	2329	1416	3745	13306	5222	18528
Agricultural engineering	498	9375	3170	12545	1747	1040	2787	11122	4210	15332
Natural resource management	454	10210	4570	14780	2926	1314	4240	13136	5884	19020
Women empowerment	425	1863	8407	10270	447	2410	2857	2310	10817	13127
Fisheries	269	4700	2360	7060	922	1055	1977	5622	3415	9037
Agricultural extension	224	3743	1701	5444	1286	561	1847	5029	2262	7291
Capacity building and group dynamics	169	2480	2846	5326	975	1932	2907	3455	4778	8233
Nutrition security	112	831	2161	2992	411	780	1191	1242	2941	4183
Post harvest technology - storage	29	400	318	718	51	58	109	451	376	827
Sericulture	10	221	11	232	53	18	71	274	29	303
Total	11433	217774	110243	328017	44546	37123	81669	262320	147366	409686

Table 34: State wise details of training courses organized for farmers/farm women

State/UT	No. of courses	General			SC/ST			Total		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	2199	47674	16203	63877	12624	5669	18293	60298	21872	82170
Tamil Nadu	3623	69615	34164	103779	13498	14100	27598	83113	48264	131377
Kerala	1078	17968	11422	29390	3387	2812	6199	21355	14234	35589
Puducherry	129	1769	1190	2959	368	393	761	2137	1583	3720
Goa	71	382	500	882	334	264	598	716	764	1480
Total	7100	137408	63479	200887	30211	23238	53449	167619	86717	254336

are given in Table 35. Most number of courses were organized on crop production (1771) followed by plant protection (799), livestock production and management (785) and horticulture (784). Maximum participation was also recorded in crop production area (56963) followed by 33116 participants in livestock production

and management. Maximum number of women farmers participated in livestock production and management (17242) followed by crop production (13338) and processing and value addition (11749). Specific training areas under the major themes of training are given in Box 1.



Table 35 : Training area wise details of courses organized and participants under farmers/farmwomen

Training Area	No. of courses	No. of participants		
		Men	Women	Total
Crop production	1771	43625	13338	56963
Plant protection	799	21620	5699	27319
Livestock production and management	785	15874	17242	33116
Horticulture	784	19470	8218	27688
Processing and value addition	529	8292	11749	20041
Soil health and fertility management	438	17400	4170	21570
Entrepreneurship development	418	7967	5113	13080
Production of inputs at site	347	9508	3144	12652
Natural resource management	330	9321	3948	13269
Agricultural engineering	260	5786	2230	8016
Women empowerment	214	1529	5235	6764
Fisheries	138	2397	1873	4270
Agricultural extension	92	1877	1212	3089
Nutrition security	86	966	2370	3336
Capacity building and group dynamics	76	1412	819	2231
Post harvest technology - storage	27	410	340	750
Sericulture	6	165	17	182
Total	7100	167619	86717	254336

Table 36 : State wise details of training courses organized for rural youth

State/UT	No. of courses	General			SC/ST			Total		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	159	2356	1877	4233	785	558	1343	3141	2435	5576
Tamil Nadu	365	6554	4345	10899	1568	1173	2741	8122	5518	13640
Kerala	287	4158	3215	7373	540	596	1136	4698	3811	8509
Puducherry	19	63	414	477	20	76	96	83	490	573
Goa	15	28	121	149	35	31	66	63	152	215
Total	845	13159	9972	23131	2948	2434	5382	16107	12406	28513

3.1.3.2 Training courses for rural youth

KVKs trained 28513 rural youth by organizing a total of 845 training courses. The state wise distribution of these training courses reveals that 365 courses were organized in Tamil Nadu followed by 287 in Kerala, 159 in Karnataka, 19 in Puducherry and 15 in Goa. The number of rural youth who participated in the KVK training courses was also in the same order wherein

13640 participants were recorded in Tamil Nadu followed by 8509 in Kerala, 5576 in Karnataka, 573 in Puducherry and 215 in Goa. The details are given in Table 36. Among 28513 rural youth trained, 5382 were SC/ST (19.00 %) and 12406 were women (43.50 %).

The training area wise categorization of courses related to rural youth revealed that most number of training courses were organized on entrepreneurship

Box 1: Specific training areas under the major themes of training

Agricultural Engineering

- Farm machinery and its maintenance
- Location specific drudgery reduction technologies
- Repair and maintenance of farm machinery and implements
- Mechanized paddy threshing
- Installation and maintenance of micro irrigation systems
- Care and maintenance of farm machinery and implements

Agricultural Extension

- Capacity building and group dynamics
- Group dynamics and farmers organization
- Leadership development
- Agril. para-workers, para-vet training
- Capacity building for ICT application
- Mobilization of social capital

Crop production

- Integrated crop management
- Integrated nutrient management
- Productivity enhancement in field crops
- Seed production
- Increasing production and productivity of crops
- Cropping systems
- Micro irrigation/irrigation
- Weed management
- Production and use of organic inputs
- Micro nutrient deficiency management in crops
- Nutrient use efficiency
- Disease management
- Seed treatment
- Use of Plastics in farming practices

Entrepreneurship development

- Mushroom production
- Nursery management
- Entrepreneurial development of farmers/ youths

- Bee-keeping
- Sericulture
- Economic empowerment of women
- Coconut palm climber/ plant protection

Fisheries

- Composite fish culture
- Ornamental fisheries
- Fisheries management
- Breeding and culture of ornamental fishes
- Fish harvest and processing technology
- Integrated fish farming
- Freshwater prawn culture
- Hatchery management and culture of freshwater prawn
- Carp fry and fingerling rearing

Horticulture

- Protected cultivation technology
- Fruit crops cultivation
- Production of low value and high volume crops
- Vegetables - commercial production
- Fruits - commercial production
- Off-season vegetables
- Plant propagation techniques
- Crop diversification
- Training and pruning of orchards
- Planting material production
- Commercial floriculture
- Management of young plants/ orchards
- Medicinal and aromatic plants
- Rejuvenation of old orchards
- Layout and management of orchards
- Vegetables - improved cultivation practices
- Ornamental plants - export potential plants
- Fruits - export potential fruits
- Precision farming
- Vegetables - export potential crops



- Ornamental plants
- Management of potted plants
- Productivity enhancement in horticulture crops
- Spices crops
- Vegetables - exotic vegetables
- High-tech horticulture
- Urban farming

Livestock production and management

- Dairy management
- Sheep and goat rearing
- Poultry management
- Feed and fodder technology
- Animal nutrition management
- Animal disease management
- Livestock production and management
- Management in farm animals
- Livestock feed and fodder production
- Rabbit management
- Piggery management
- Integrated dairying and vermicompost preparation
- Quail rearing

Natural Resource Management

- Integrated farming systems
- Resource conservation technologies
- Integrated water management

Nutrition security

- Household food security
- Household nutritional security
- Low cost and nutrient efficient diet designing
- Designing and development for high nutrient efficiency diet

Plant protection

- Integrated pest management in pulses
- Integrated disease management
- Bio-control of pests and diseases
- Integrated pest and disease management
- Management of pests and diseases

- Safe use of pesticides

Processing and value addition

- Processing and value addition
- Post harvest technology and value addition
- Value addition
- Small scale processing and value addition
- Storage loss minimization techniques
- Grading and standardization
- Production of quality animal products

Production of inputs at site

- Vermi-compost production
- Production of organic inputs
- Production of bio control agents and bio pesticides
- Organic manures production
- Bio-agents production
- Small tools and implements
- Production of inputs at site
- Bio-fertilizer production
- Production of livestock feed and fodder

Soil health and fertility management

- Soil health and fertility management
- Soil and water testing
- Organic farming
- Soil and water conservation techniques
- Balance use of fertilizers
- Management of problematic soils

Women empowerment

- Income generation activities
- Processing and cooking
- Rural crafts
- Women and child care
- Tailoring, stitching, embroidery, dying etc.
- Design and development of low/ minimum cost diet
- Women empowerment
- Gender mainstreaming through SHGs
- Minimization of nutrient loss in processing
- Drudgery reduction of women

Table 37 : Training area wise details of courses organized and participants under rural youth

Training area	No. of courses	No. of participants		
		Men	Women	Total
Entrepreneurship development	162	2323	2202	4525
Processing and value addition	117	1213	1922	3135
Livestock production and management	105	2298	1143	3441
Fisheries	69	1468	791	2259
Production of inputs at site	69	1724	777	2501
Horticulture	64	1394	915	2309
Crop production	58	1435	634	2069
Natural resource management	46	1738	1163	2901
Women empowerment	45	138	1384	1522
Agricultural engineering	28	642	265	907
Soil health and fertility management	23	742	403	1145
Plant protection	22	453	262	715
Agricultural extension	19	319	167	486
Nutrition security	12	136	353	489
Capacity building and group dynamics	6	84	25	109
Total	845	16107	12406	28513

development (162) followed by in the area of processing and value addition (117), with a participation of 4525 and 3135 rural youth respectively (Table 37). Other major areas of training courses which involved rural youth are livestock production and management (105 courses, 3441 participants), fisheries and production of inputs at site (69 courses each with a participation of 2259 and 2501 rural youth respectively). Maximum number of women in the rural youth category preferred training related to entrepreneurship

*Training for farmers and rural youth at KVK Bijapur*

development (2202) followed by processing and value addition (1922).

3.1.3.3 Extension functionaries

The state-wise details of training courses organized for extension functionaries by the KVKs and the participation level are given in Table 38. The data indicated that a total of 501 courses were organized with a participation of 16123 extension functionaries. Among the different states, 301 courses were organized in Tamil Nadu followed by 108 courses in Karnataka, 72 courses in Kerala, 15 courses in Puducherry and 5 courses in Goa. In terms of participation, about 62 per cent of these participants were recorded in Tamil Nadu (10022 out of a total of 16123). Extent of SC/ST and women participation in different states indicates that Tamil Nadu recorded higher participation from SC/ST community



Training of extension functionaries at KVK Bijapur

(1287 out of a total of 2213) and women extension functionaries (2311 out of a total of 4679).

The details of training courses organized for extension functionaries during the year are given in Table 39. Maximum participation was recorded in the area of crop production wherein 197 courses (out of 501) attracted 6824 extension functionaries (out of a total of 16123). Other areas of interest for extension functionaries were plant protection (59 courses, 2058 participants) and horticulture (45 courses, 1250 participants). Participation of women extension functionaries was highest in the area of crop production (1480 out of 4679).

Table 38: State wise details of training courses organized for extension functionaries

State/UT	No. of courses	General			SC/ST			Total		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	108	2177	756	2933	402	260	662	2579	1016	3595
Tamil Nadu	301	6851	1884	8735	860	427	1287	7711	2311	10022
Kerala	72	771	1074	1845	85	126	211	856	1200	2056
Puducherry	15	197	115	312	11	17	28	208	132	340
Goa	5	65	20	85	25	0	25	90	20	110
TOTAL	501	10061	3849	13910	1383	830	2213	11444	4679	16123

Table 39. Training area wise details of courses organized and participants under extension functionaries

Training Area	No. of courses	No. of participants		
		Men	Women	Total
Crop production	197	5344	1480	6824
Plant protection	59	1569	489	2058
Horticulture	45	902	348	1250
Livestock production and management	31	811	380	1191
Agricultural extension	27	438	270	708
Women empowerment	22	24	550	574
Production of inputs at site	19	300	100	400
Processing and value addition	18	149	356	505
Capacity building and group dynamics	16	464	133	597
Soil health and fertility management	15	384	85	469
Agricultural engineering	14	396	112	508
Nutrition security	14	140	218	358
Natural resource management	9	160	45	205
Entrepreneurship development	6	142	53	195
Fisheries	5	112	48	160
Sericulture	4	109	12	121
Total	501	11444	4679	16123

3.1.3.4 Sponsored training courses

A total of 2593 sponsored training courses were organized by the KVKs during 2012-13 (Table 40). Tamil Nadu had most number of sponsored training courses and participants (1097 courses, 42889 participants) followed by Kerala (730 courses, 25366 participants) and Karnataka (716 courses, 30663 participants). Out of 100219 participants, 18553 were from SC/ST community (18.5 per cent) and 39139 were women (39 per cent).



Sponsored training on coconut climbing at KVK Pathanamthitta

Under sponsored courses category, 645 courses were conducted in the area of crop production followed by 296 courses in the area of livestock production and management with a participation of 24412 and 13319 participants respectively. Details are available in Table 41.



Sponsored training on coconut climbing at KVK Uttara Kannada

3.1.3.5 Vocational training courses

During the reporting period, 394 vocational training courses were organized by KVKs with the participation of 10495 participants. In Tamil Nadu, KVKs organized 174 courses with a participation of 5271 participants. In Kerala, KVKs organized 132 courses with 2878 participants. Details of number of courses and participants in each State/UT of the Zone are given in Table 42. Participation of women was encouraging in vocational training courses with a participation of 42.00 per cent (4425 out of 10495).

Vocational training courses were organized on 12 major areas as detailed in Table 43. Most courses were

Table 40 : State wise details of sponsored training courses organized and distribution of participants

State/UT	No. of courses	General			SC/ST			Total		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	716	13653	9507	23160	3656	3847	7503	17309	13354	30663
Tamil Nadu	1097	25560	10254	35814	3494	3581	7075	29054	13835	42889
Kerala	730	12956	9539	22495	1499	1372	2871	14455	10911	25366
Puducherry	48	48	99	147	195	909	1104	243	1008	1251
Goa	2	19	31	50	0	0	0	19	31	50
Total	2593	52236	29430	81666	8844	9709	18553	61080	39139	100219

Table 41. Thematic area wise details of sponsored training courses organized and distribution of participants

Training area	No. of courses	No. of participants		
		Men	Women	Total
Crop production	645	18690	5722	24412
Livestock production and management	296	5694	7625	13319
Horticulture	251	7264	2564	9828
Processing and value addition	231	3901	4878	8779
Plant protection	217	5442	2297	7739
Entrepreneurship development	186	4065	2380	6445
Agricultural engineering	173	3889	1469	5358
Women empowerment	137	689	4114	4803
Soil health and fertility management	132	3350	1472	4822
Production of inputs at site	75	1290	1012	2302
Capacity building and group dynamics	71	1495	3801	5296
Agricultural extension	70	2109	518	2627
Natural resource management	59	1714	635	2349
Fisheries	48	1447	616	2063
Post harvest technology - storage	2	41	36	77
Total	2593	61080	39139	100219

Table 42 : State wise details of vocational training courses organized and distribution of participants

State/UT	No. of courses	General			SC/ST			Total		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	80	839	742	1581	338	275	613	1177	1017	2194
Tamil Nadu	174	2676	1657	4333	499	439	938	3175	2096	5271
Kerala	132	1329	1081	2410	284	184	468	1613	1265	2878
Puducherry	5	44	23	67	14	14	28	58	37	95
Goa	3	22	10	32	25	0	25	47	10	57
Total	394	4910	3513	8423	1160	912	2072	6070	4425	10495

conducted on entrepreneurship development with 91 (out of 394) courses for 2488 participants. Processing and value addition was the second most preferred area for vocational training with 56 courses and 1492 participants. Details of number of courses in different areas along with the participation of women are given in the same Table 43.

KVKs are documenting the effect of training courses on the backhome situation of participants through necessary follow up actions and feedback studies. Further they are also identifying farmers as master trainers as well as resource experts



Vocational training at KVK Bijapur

Table 43. Thematic area wise details of vocational training courses organized and distribution of participants

Training Area	No. of courses	No. of participants		
		Men	Women	Total
Entrepreneurship development	91	1433	1055	2488
Processing and value addition	56	423	1069	1492
Livestock production and management	42	624	608	1232
Crop production	35	721	189	910
Horticulture	32	611	261	872
Women empowerment	32	174	485	659
Production of inputs at site	28	484	189	673
Agricultural engineering	23	409	134	543
Soil health and fertility management	20	504	160	664
Agricultural extension	16	286	95	381
Natural resource management	10	203	93	296
Fisheries	9	198	87	285
Total	394	6070	4425	10495

for conducting training courses for different stakeholders.

3.1.4 Frontline extension programmes

KVKs made efforts to create awareness about recent developments in agriculture and allied sectors among farmers, extension personnel and other stakeholders through different individual, group and mass contact methods. Further, KVKs are in the forefront of mass media utilization in disseminating timely and relevant technologies to the farming community without any time lag. Frontline extension programmes undertaken by the KVKs helps to disseminate various technologies among farmers on a larger scale. In this process the coordination with development departments and private agencies is crucial for successful conduct of extension programmes. Various extension programmes carried out by KVKs in coordination and collaboration with other line departments/ agencies working in the district during the year are briefly presented here under.

A total of 89326 extension programmes and services were organized through different methods and means wherein technologies related to agriculture and allied sectors were appraised among 29.86 lakh farmers

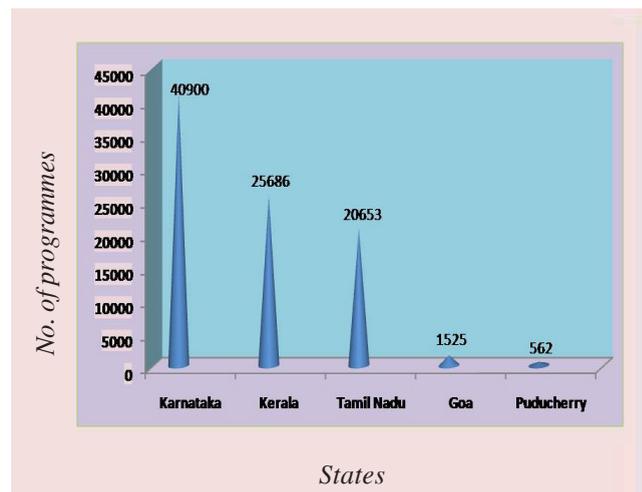


Fig. 10: State wise details of frontline extension programmes organized

and 0.74 lakh extension personnel (Table 44). Data further indicated that KVKs in Karnataka organized maximum extension programmes (40900) followed by Kerala (25686), Tamil Nadu (20653), Puducherry (1525) and Goa (562). Details of activity wise extension programmes organized are furnished in Fig.10 and Table 45. Data implies that KVKs' efforts through extension programmes covered a large number of farmers and made them aware about new technologies, activities and enterprises.

Table 44: State wise frontline extension programmes organized and distribution of participants

Activity	No. of programmes	No. of farmers			No. of extension personnel		
		Men	Women	Total	Men	Women	Total
Karnataka	40900	1643263	641029	2284292	32207	10670	42877
Tamil Nadu	20653	319972	140717	460689	12677	5962	18639
Kerala	25686	143662	74284	217946	6835	5066	11901
Puducherry	1525	7814	7603	15417	656	234	890
Goa	562	5145	3109	8254	104	16	120
Total	89326	2119856	866742	2986598	52479	21948	74427



Various extension programmes organized by the KVKs



KVKs have organized a total of 89326 extension programmes and created an awareness among 29.86 lakh farmers and 0.74 lakh extension personnel and public on various aspects like varietal performance, production technologies, Integrated Pest and Disease Management, animal health and nutrition, production technologies of poultry, fisheries, human nutrition etc.

KVKs popularized technologies through extension literature (3214), newspaper coverage (2032), popular articles (664), radio talks (575) and T V talks (391). State-wise details are presented in Table 46.

3.1.5 Technology week

Technology week creates awareness about the latest technologies in various aspects of agriculture and allied sectors. Normally it is observed for a period of 4 to 6 days. A total of 42935 farmers and 804 officials

Table 45 : Activity wise extension programmes organised and distribution of participants

Activity	No. of programmes	No. of farmers			No. of extension personnel		
		Men	Women	Total	Men	Women	Total
Advisory services	42640	54460	16305	70765	2394	1043	3437
Farmers visit to KVK	17008	70853	21730	92583	5549	2403	7952
Scientific visit to farmers fields	9473	24804	7450	32254	2561	700	3261
Others like FFS, farm innovators meet, awareness programmes etc.	4045	176982	25966	202948	2972	1670	4642
Diagnostic visits	3712	11215	3526	14741	721	304	1025
Lectures delivered as resource persons	3055	84044	35975	120019	5498	1853	7351
Method demonstrations	2192	29322	14069	43391	2085	958	3043
Group meetings	1221	19875	9854	29729	1848	695	2543
Agri mobile clinic services	1149	934	316	1250	80	28	108
Film shows	1110	25983	12183	38166	3599	654	4253
Exposure visits	642	12855	3811	16666	822	370	1192
Field days	625	18655	6432	25087	1303	441	1744
Animal health camps	507	7638	3144	10782	420	126	546
Exhibitions	467	467345	139306	606651	12724	6118	18842
Self help group conveners - meetings	303	1529	6908	8437	222	755	977
Farmers seminars	228	15402	6401	21803	1165	469	1634
Kisan melas	170	1053268	531750	1585018	4987	1613	6600
Farm science club conveners meet	161	2857	1215	4072	166	155	321
Celebration of important days	153	21173	11670	32843	451	370	821
Workshops	129	3571	1310	4881	1574	618	2192
Kisan ghosthi	119	11563	5289	16852	667	255	922
Soil health camps	102	2404	742	3146	298	240	538
Soil test campaigns	70	2212	917	3129	349	78	427
Ex-trainees sammelan	38	902	331	1233	24	18	42
Mahila mandals conveners meetings	7	10	142	152	0	14	14
Total	89326	2119856	866742	2986598	52479	21948	74427



have participated in technology week programmes organized by 31 KVKs. This programme enabled the KVKs to have strong linkages and collaboration with various line departments of the district, as evident by the involvement of 533 agencies, technical programmes including 233 demonstrations, 42 kisan ghosties, 310 lecturers from eminent scientists and experienced officials, 26 exhibitions, 103 film shows, 152 visit to farms and 75 method demonstrations on hands on experience.

In addition, 26.02 q of high yielding varieties / hybrid seeds, 28936 planting materials, 6.92 q of bio-products, 1.40 q of bio-fertilizers, 2910 livestock and

514 fingerlings were made available to participating farmers, extension officials and other stakeholders.

3.1.6 Kisan mobile advisory

Kisan Mobile Advisory is one of the Information and Communication Technology (ICT) tools for dissemination of requisite and need based information at the right time to the farmers. KVKs are sending information via SMS/Voice call to farmers advising them on the vital issues of agricultural importance. During the reporting period, 41 KVKs have advised farmers regularly on the areas of crops, livestock, other enterprises, weather, marketing and awareness of latest

Table 46 : State wise extension programmes organized for mass contact

Activity	No. of programmes					Total
	Karnataka	Tamil Nadu	Kerala	Goa	Puducherry	
Extension literature	935	1490	700	0	89	3214
News paper coverage	753	784	464	2	29	2032
Popular articles	269	241	72	0	82	664
Radio talks	213	280	64	0	18	575
TV talks	116	206	47	0	22	391

Table 47: Details of state wise SMSs/ voice calls sent on various priority areas by KVKs to farmers

Name of State	MessageType	Crop	Livestock	Weather	Marketing	Publicity	Other enterprises	Total
Karnataka	Text only	763	120	146	97	191	89	1406
	Voice only	339	49	71	44	130	100	733
	Voice & Text both	285	44	17	12	10	19	387
	Total	1387	213	234	153	331	208	2526
Tamil Nadu	Text only	1384	489	776	778	1080	444	4951
	Voice only	231	129	52	30	293	29	764
	Total	1615	618	828	808	1373	473	5715
Kerala	Text only	28	21	7	16	61	23	156
Goa	Text only	12	0	0	0	0	0	12
Total messages	Text only	2187	630	929	891	1332	556	6525
	Voice only	570	178	123	74	423	129	1497
	Voice & Text both	285	44	17	12	10	19	387
Grand Total		3042	852	1069	977	1765	704	8409

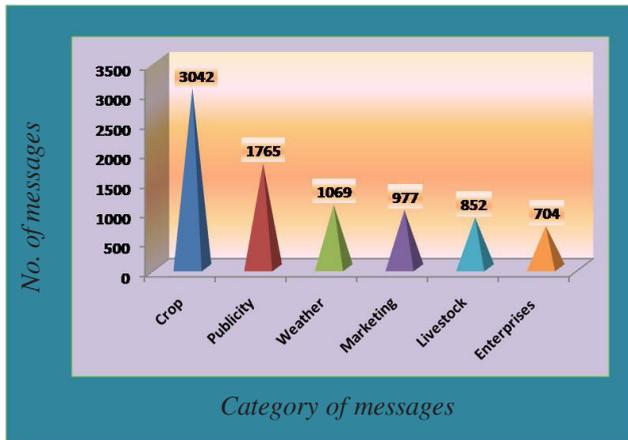


Fig.11 : Category wise no. of SMS/voice calls sent by KVKs

agricultural technologies through text messages and/or voice calls depending on the expertise and facility available with them. A total of 8409 SMSs / Voice calls have been sent to farmers. Out of which, 6525 were text messages, 1497 voice calls and 387 text plus voice calls. These communications were mainly on crops (3042), activity publicity (1765), weather (1069), marketing (977), livestock (852) and other enterprises (704) (Fig.11). The details are presented in Table 47.

3.1.7 E-Connectivity

The Indian Council of Agricultural Research has provided e-linkage to selected KVKs and Zonal Project Directorates during XI plan. In Zone VIII, e-linkage facility was established in 37 KVKs along with Zonal Project Directorate, Bangalore. State-wise list of KVKs is provided in Table 48. These KVKs have been connected electronically through VSAT and connected to the KVK Hub established at Agricultural Extension

Table 48: KVKs with e-linkage facility

States	No. of KVKs	Districts
Karnataka	11	Bidar, Belgaum, Chitradurga, Chickmagalur, Gadag, Gulbarga, Haveri, Hassan, Mandya, Mysore, Raichur
Tamil Nadu	14	Cuddalore, Dindigul, Erode, Kancheepuram, Karur, Madurai, Pudukottai, Salem, Trichy, Ramanathapuram, The Nilgiris, Thiruvannamalai, Tuticorin, Vellore
Kerala	10	Calicut, Kannur, Kasaragod, Kollam, Malappuram, Palghat, Pathanamthitta, Thrissur, Thiruvananthapuram, Wayanad
Puducherry	1	Puducherry
Goa	1	North Goa
Total	37	

Division, New Delhi. The communication between KVKs across the country was enabled through IP phones provided to each KVK. Using this facility, 26 e-seminars were webcasted from the KVK Hub involving experts on various topics of interest to KVKs.

3.1.8 Production of technological inputs

To achieve the potential yield in agriculture and allied sectors, timely availability of good quality seeds, planting materials, livestock breeds and bio-products are the primary requirement. In this direction, KVKs are actively involved in the production of quality seeds, planting materials, livestock materials, bio-products and supplying them to the needy farmers.

Quality technological products

KVKs of Zone VIII have produced and supplied 5778.82 q of seeds of different crop varieties and hybrids, 61.50 lakh numbers of planting materials of different crops and hybrids, 1755.84 q of bio-products and 2.09 lakh of livestock strains and fish fingerlings benefiting 2.48 lakh farmers.

During the period under report, KVKs have produced 5743.84 q seeds of crop varieties, 1755.84 q bio-products and 34.98 q seeds of crop hybrids worth Rs. 226.84, 82.75 and 0.66 lakh and supplied to 60587, 48847 and 69 farmers, respectively. KVKs produced 58.64 lakh number of planting materials of varieties, 2.86 lakh number of planting materials of hybrids and



Table 49: Production and supply of technological inputs

Category	Quantity	Value (Rs. in lakh)	Farmers (No.)
Seeds of crop varieties (q)	5743.84	226.84	60587
Bio- products (q)	1755.84	82.75	48847
Seeds of crop hybrids (q)	34.98	0.66	69
Planting materials of crops (No. in lakh)	58.64	163.02	125220
Planting materials of crop hybrids (No. in lakh)	2.86	2.35	2744
Livestock and fisheries (No. in lakh)	2.09	76.24	10786

Table 50 : State-wise production of seeds and planting materials by KVKs

State	Seeds			Planting materials		
	Quantity (q)	Value (Rs. in lakh)	Farmers (No.)	Quantity (No.)	Value (Rs. in lakh)	Farmers (No.)
Karnataka	3617.83	107.16	12662	8.65	43.04	57977
Tamil Nadu	1154.66	68.09	10313	27.06	63.04	16744
Kerala	130.20	33.36	37257	7.11	42.32	46803
Puducherry	734.34	15.67	355*	15.69	12.10	3196
Goa	106.81	2.56	**	0.13	2.52	500
Total	5743.84	226.84	60587	58.64	163.02	125220

* Also supplied to Society (PASIC),Puducherry; * *Supplied to Department of Agriculture, Government of Goa

Table 51: Crop category wise production of seeds

Crop category	Quantity (q)	Value (Rs. in lakh)	Farmers (No.)
Cereals	3451.27	78.27	7835
Commercial crops	1294.00	24.18	88
Pulses	320.23	22.36	5455
Oilseed crops	203.71	12.43	1456
Spices	158.36	3.94	3270
Vegetable crops	142.82	48.91	34871
Fodder crops	101.39	34.51	6077
Tuber crops	61.58	1.58	1402
Fiber crops	9.43	0.58	115
Flower crops	1.05	0.08	18
Total	5743.84	226.84	60587

2.09 lakh number livestock and fisheries worth Rs. 163.02, 2.35 and 76.24 lakh and supplied to 125220, 2744 and 10786 farmers, respectively (Table 49).

3.1.5.1 Seeds: KVKs in Karnataka have produced more quantity (3617.83 q) of seeds followed by KVKs of Tamil Nadu, Puducherry, Kerala and Goa (Table 50 and Fig.12). Out of total seed produced, more quantity (3451.27 q) was produced on cereals followed by commercial, pulses, oilseeds, spices, vegetables, fodder, tuber, fibre and flower crops (Table 51).

3.1.5.2 Planting materials : KVKs in Tamil Nadu have produced more number of planting materials (27.06 lakh) of crops followed by KVKs in Puducherry, Karnataka, Kerala and Goa (Table 50 and Fig. 13). Out of which, 26.73 lakh were fodder slips and the rest were seedlings of vegetables, flower crops, fruit crops, pulses,

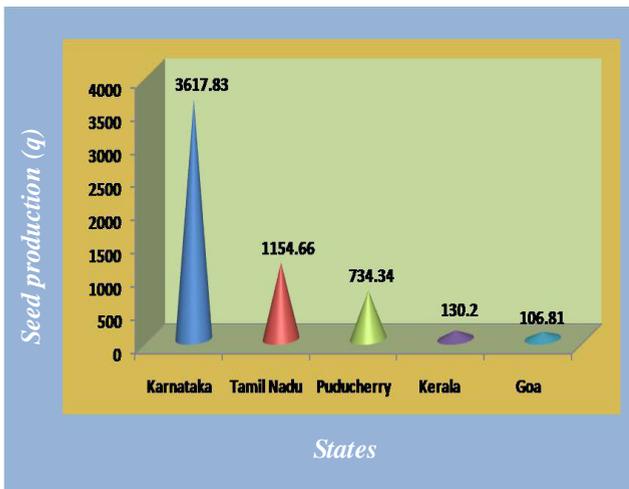


Fig. 12: State wise seed production (q) by KVKs

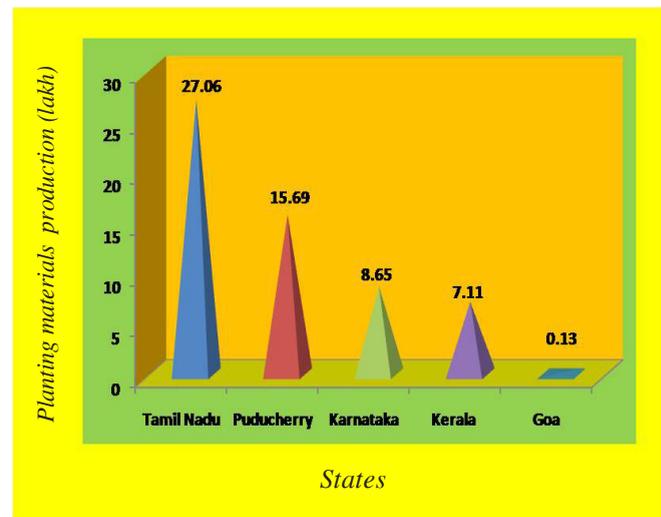


Fig. 13 : State wise planting materials production (lakh) by KVKs

KVKs in Karnataka

Produced a total of 1805.78 q seeds of paddy varieties (MO 4, Thunga, BPT 5204, IR 64, Intan, Abhilash and Jaya) and provided to 2936 farmers through participatory seed production that covered in an area of 4514.45 ha followed by 120.23 q seeds of jowar varieties (M 35-1, CVS 22, Anuradha and DSV 4) covered in an area of 801.53 ha belonging to 1382 farmers, 81.34 q seeds of finger millet varieties (MR 6, GPU 48, KMR 301, GPU 28, MR 66, ML 365 and Sukshema) covered in an area of 1626.80 ha belonging to 1709 farmers, 103.17 q seeds of pigeonpea varieties (BRG 2, TS 3 R, BSMR 736, BRG 1) covered in an area of 687.80 ha belonging to 1651 farmers, 70.50 q seeds of maize varieties (NAH 2049, SA Tall) covered in an area of 352.50 ha belonging to 57 farmers, 134.50 q seeds of soyabean variety (JS 335) covered in an area of 206.92 ha belonging to 323 farmers, 114.49 q seeds of chickpea varieties (JG 11, A 1, BGD 103, GBM 2) covered in an area of 127.21 ha belonging to 338 farmers, 29.23 q seeds of greengram varieties (Chinamung, BGS 9) covered in an area of 116.92 ha belonging to 693 farmers, 45 q seeds of wheat varieties (DWR 195, UAS 304) covered in an area of 45.00 ha belonging to 418 farmers and 32.7 q seeds of groundnut varieties (TAG 24, GPBD 4, DH 86) covered in an area of 26.16 ha belonging to 25 farmers.

Further, they produced a total number of 21354 seedlings of coconut varieties (Arasikere Tall, WCT, COD, MGD) and provided to 796 farmers that covered in an area of 122.02 ha followed by 54576 seedlings of arecanut varieties (Mangala, Theerthalli, Hirehalli Tall) covered in an area of 97.45 ha belonging to 98 farmers, 24923 seedlings of mango (varieties Alphanso, Rasapuri, Badami) covered in an area of 83.07 ha belonging to 1401 farmers, 24917 seedlings of papaya varieties (Solo, Red lady, Taiwan -786, Surya) covered in an area of 24.91 ha belonging to 239 farmers, 135000 redgram variety (BSMR-736) covered in an area of 21.60 ha belonging to 51400 farmers and 404216 planting sets of hybrid napier (DHN-6, Co-3, CO-4) covered in an area of 10.10 ha belonging to 550 farmers.



KVKs in Tamil Nadu

Produced a total of 446.4 q seeds of maize variety (NK 6240) and provided to 2643 farmers that covered in an area of 2232.00 ha followed by 399.76 q seeds of paddy varieties (ADT 39, CO (R)50, ADT 49, BPT 5204 (F - II), BPT 5204 , ADT 50, TRY 3, ADT 45, ADT 43, RMD(R)1, ADT45, ADT (R) 49, ADT (R) 50, TRY -3 (TFL), ADT 50 (TFL), Swarna sub 1 , CR 1009 (TFL), ADT 46 (TFL), ADT 36 (TFL), TKM 9 (TFL), ADT 43 (TFL), PRASANNA, BPT 5204, TRY(P)-3) covered in an area of 999.40 ha belonging to 1610 farmers, 17.5 q of bajra variety (CO(Cu)-9) covered in an area of 140.00 ha belonging to 35 farmers, 24.85 q seeds of blackgram varieties (Shekher-1, VBN 3, VBN 6, VBN 4, VBN 5, VBN 7) covered in an area of 124.25 ha belonging to 426 farmers, 13.07 q seeds of greengram varieties (Co.6, VBN 3, VBN2, VRMGG 1) covered in an area of 65.35 ha belonging to 148 farmers, 26.28 q seeds of groundnut varieties (Co-6, TMV 13, TMV 7) covered in an area of 21.02 ha belonging to 90 farmers.

Further, they produced 48724 grafts of mango varieties (Bangalora, Neelam, Banganapalli, Sindhura, Imampasand, Tottapuri, Kesar, Neelam, Himahudin, Mulgoa) that covered in an area of 243.62 ha belonging to 1225 farmers followed by 23312 seedlings of coconut varieties (T X D, D x T, WCT, COD, MYD, ECT) covered in an area of 133.21 ha belonging to 2170 farmers, 11034 grafts of sapota varieties (PKM-1, PKM-4, CO3) covered in an area of 110.34 ha belonging to 213 farmers, 2075720 sets of hybrid napier (Co-3, Co-4) covered in an area of 51.89 ha belonging to 42 farmers, 10311 grafts of guava varieties (Lucknow-49, Allahabad Safeda) covered in an area of 12.88 ha belonging to 493 farmers and 12444 seedlings of amla varieties (NA 7, BSR-1, Krishna, Kanchan) covered in an area of 10.37 ha belonging to 672 farmers.

plantation crops, forest species, medicinal and aromatic crops, tuber crops, spices, commercial crops, ornamental plants, and fibre crops (Table 52).

3.1.5.3 Hybrid seeds and planting materials: Out of hybrid seeds produced, more quantity (34.70 q) was produced under cereals followed by commercial crops, vegetables and fibre crops (Table 53). In the case of planting materials, more number (0.96 lakh) was produced under the crop green chillies followed by tomato, watermelon, cauliflower, cabbage, capsicum, brinjal, cowpea and bhendi (Table 54).

3.1.5.4 Bio-products : KVKs in Tamil Nadu have produced more quantity (833.70 q) of bio-products followed by KVKs in Kerala, Karnataka, Puducherry and Goa (Table 55 and Fig.14). Out of total production of bio-products, more quantity (853.67 q) was produced under vermicompost followed by bio pesticides, micro nutrient mixtures, bio fungicides, bio fertilizers, bio agents, mushroom spawn (Table 56). Further, 387680 number of *Acerophagus papayae* parasitoids, 22550 EPN, 10182 Trico cards and 7367 pheromone traps were produced (Table 57).

Table 52: Crop category wise production of planting materials

Crop category	Quantity (No. in lakh)	Value (Rs. in lakh)	Farmers (No.)
Fodder crops	26.73	11.03	1835
Vegetable crops	17.22	17.59	29343
Flower crops	4.96	6.69	3582
Fruit crops	2.71	67.41	14638
Pulses	1.41	1.79	51435
Plantation crops	1.35	27.80	7498
Forest species	1.32	9.84	4431
Medicinal and aromatic crops	0.94	2.41	1098
Tuber crops	0.57	0.58	57
Spices	0.55	6.53	6715
Ornamental plants	0.44	0.90	287
Commercial crops	0.39	10.25	4199
Fibre crops	0.05	0.20	100
Total	58.64	163.02	

KVKs in Kerala

Produced a total of 15.22 q seeds of yard long bean (Anaswara, Lola, Sharika, Vellayani local, Jyothika) and provided to 6109 farmers that covered in an area of 101.47 ha as well as 18.76 q seeds of paddy varieties (Vysakh, Jyothi, Aiswarya, Uma) covered in an area of 46.90 ha belonging to 137 farmers.

Further they produced a total number of 17847 seedlings of coconut varieties (MGD, MOD, WCT, CDO, T x D) and provided to 2167 farmers that covered in an area of 101.98 ha followed by 17825 seedlings of arecanut varieties (Mangala, Sumangala, Sreemangala, Mohit Nagar, Dakshina Kannada Local) covered in an area of 14.01 ha belonging to 1354 farmers, 26591 suckers and tissue culture of banana varieties (Udayam, Nendran, Palayankodan, Njalipoovan, Poojakkadali, Robusta) covered in an area of 10.63 ha belonging to 1493 farmers, 197284 seedlings of cabbage varieties (NS 35, NS 43, NS183) covered in an area of 9.86 ha belonging to 18197 farmers and 148600 seedlings of cauliflower variety (NS 60) covered in an area of 7.43 ha belonging to 3632 farmers.



Fig.14 : State wise bio-products production (q) by KVKs

Table 53 : Category wise production of hybrid seeds

Category	Quantity (q)	Value (Rs.)	Farmers (No.)
Cereals	34.70	43042.00	34
Commercial crops	0.26	7696.00	30
Fiber crops	0.01	1050.00	01
Vegetable crops	0.01	15000.00	04
Total	34.98	66788	69

KVKs in Puducherry and Goa

KVKs in Puducherry produced a total of 732.30 q seeds of paddy varieties (TKM-9, ADT-48, ADT-43, ADT-45, Co(R)-49, ADT(R)-46, I.W.Ponni, CR-1009, ADT(R)-49, Co(R)-50, ADT 37, Savithri) and provided to 344 farmers and also one society (PASIC), Puducherry that covered in an area of 1830.75 ha. Further, they produced 870144 seedlings of brinjal variety PLR 2 that covered in an area of 62.15 ha belonging to 75 farmers followed by 187100 seedlings of muskmelon covered in an area of 18.71 ha belonging to 22 farmers.

KVKs in Goa produced 106.82 q seeds of paddy variety (Karjat-3) and provided to farmers through Department of Agriculture, Government of Goa that covered in an area of 667.63 ha. Further, they produced a total number of 900 seedlings of mango variety (Amrapali) and provided to 54 farmers that covered in an area of 3.00 ha.

Table 54: Crop wise production of planting materials of hybrids

Crop	Quantity (No)	Value (Rs.)	Farmers (No.)
Chilli green	96409	48422.00	72
Tomato	52821	23938.00	34
Watermelon	50400	23475.00	28
Cauliflower	26995	57275.00	547
Cabbage	26357	50845.50	660
Capsicum	23520	16465.00	863
Brinjal	7121	9935.50	261
Cowpea	1650	3300.00	156
Bhendi	1000	2000.00	123
Total	286273	235656.00	2744

3.1.5.5 Livestock and fisheries : KVKs in Tamil Nadu have produced more quantity of livestock materials and fisheries (93353 numbers) followed by Puducherry, Kerala and Karnataka (Table 58 and Fig.15). Out of total production of livestock materials and fisheries, more quantity (1.24 lakh) produced under fisheries followed by poultry, poultry (egg), goat and



Planting materials production at KVKs

Table 55: State wise production of bio-products by KVKs

State	Quantity (q)	Value (Rs. in lakh)	Farmers (No.)
Karnataka	317.77	19.73	8016
Tamil Nadu	833.70	28.65	12631
Kerala	499.28	25.68	25754
Puducherry	103.03	8.54	2431
Goa	2.06	0.15	15
Total	1755.84	82.75	48847

Table 56 : Category wise production of bio-products

Category	Quantity (q)	Value (Rs. in lakh)	Farmers (No.)
Vermicompost	853.67	4.50	4166
Bio pesticides	461.27	30.52	22156
Micro nutrient mixtures	243.45	31.93	9224
Bio fungicides	142.02	10.92	6754
Bio fertilisers	34.17	1.47	5054
Bio agents	11.39	2.33	904
Mushroom spawn	9.87	1.08	589
Total	1755.84	82.75	48847

KVKs have produced and supplied 1755.84 q of bio products, 387680 number of *Acerophagus papayae*, 22550 EPN, 10182 Trico cards and 7367 pheromone traps through which 0.59 lakh farmers motivated to follow farming organically as well as to reduce the application of chemical fertilizers, fungicides and pesticides.

Table 57: Production of other bio products

Category	Quantity (No)	Value (Rs. in lakh)	Farmers (No.)
<i>Acerophagus papayae</i>	382180	Free	2018
<i>Acerophagus papayae</i>	5500	0.05	25
EPN	22550	0.22	200
Trico cards	10182	2.14	1251
Pheromone traps	7367	7.19	2417
Total	427779	9.60	5911

Table 58: State wise production of livestock materials and fisheries

State	Quantity (No)	Value (Rs. in lakh)	Farmers (No.)
Karnataka	31101	10.72	1336
Tamil Nadu	93353	39.46	4446
Kerala	35891	24.52	4822
Puducherry	48687	1.54	182
Total	209032	76.24	10786

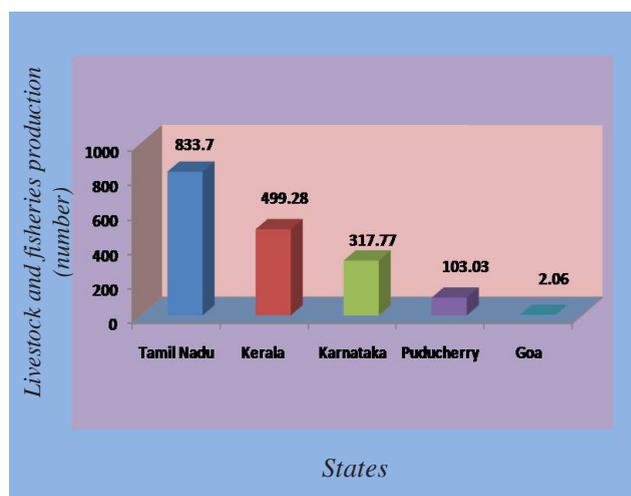


Fig.15 : State wise production of livestock and fisheries materials (number) by KVKs

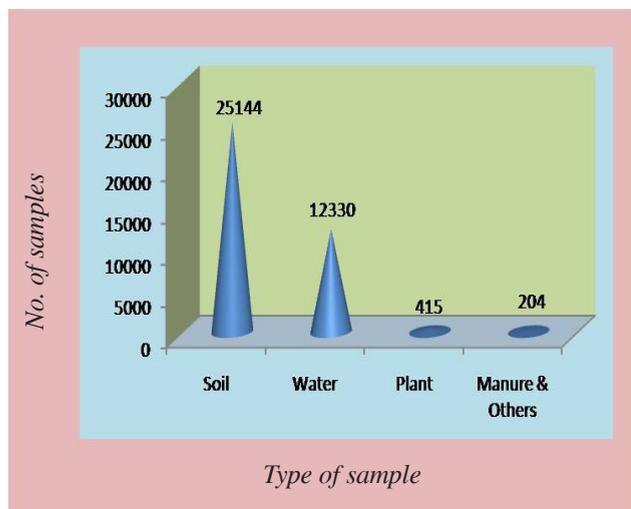
sheep, rabbitry, piggery, dairy cow and dairy cow (calf) (Table 59).

3.1.9 Soil, water and plant analysis

A total of 67 KVKs have established soil, water and plant testing laboratory and carrying out the analysis for the benefit of farming community. Further, KVKs are also utilizing this facility for carrying out the soil

Table 59: Category wise production of livestock materials and fisheries

Category	Quantity (No)	Value (Rs. in lakh)	Farmers (No.)
Fisheries	123799	2.62	1046
Poultry	66386	47.37	6609
Poultry (egg)	18010	0.67	2741
Goat and sheep	466	15.72	180
Rabitory	170	0.33	77
Piggery	165	4.60	107
Dairy cow	27	4.55	18
Dairy cow (calf)	9	0.38	8
Total	209032	76.24	10786

**Fig. 16: State wise number of samples analyzed through soil, water and plant testing laboratory by KVKs**

test based nutrient recommendation for conducting FLDs and OFTs as well rendering advisory services on nutrient based recommendations to the farmers. During the year, a total of 38093 samples of soil, water,

Table 60: Work progress of SWPTL

Type of sample	No. of samples	No. of farmers	No. of villages	Amount realized (Rs.)
Soil	25144	20620	9095	1543034
Water	12330	11262	6067	693185
Plant	415	701	385	9190
Others (lime, briquette, wood etc)	161	66	45	44250
Manure	43	11	14	8706
Total	38093	32660	15606	2298365

plant, manure, lime etc received from 32660 farmers belonging to 15606 villages were analyzed (Fig.16) and realized an amount of Rs. 22.98 lakh (Table 60). State wise data showed that KVKs in Karnataka analyzed more samples (26746) followed by Tamil Nadu (8435), Kerala (1789), Goa (680) and Puducherry (443) (Table 61).

3.1.10 Rain water harvesting units

Rain water harvesting unit with micro irrigation system was established in 16 KVKs. A total of 88 training courses and 61 demonstrations were conducted utilizing this facility and produced 1.57 lakh planting materials. Further, 10348 farmers and 590 officials visited these units and got acquainted with the rain water harvesting techniques.

3.1.11 Convergence and linkages

KVKs involved with 22 different organizations as part of their linkage and collaborative activities during 2012-13. The Organizations having linkage and collaboration with KVKs have been listed in Table 62. The nature of linkage with each organization is described in the ensuing paragraphs.

1. Department of Agriculture

- Help KVK in identification of beneficiaries for trainings, supporting implementation of FLD, OFT, trainings, technology week, farmers field school, FLD – field day, farmers- scientists interactions, Interface meeting
- KVKs involve in joint diagnostic survey, joint field inspection at times of pest and disease outbreaks, krishi mohosthava, *raitha dasara*, contingency crop planning, *kharif* and *rabi* campaigns, soil

**Table 61: State wise soil, water, plant analysis undertaken**

State	No. of samples	No. of farmers	No. of villages	Amount realized (Rs.)
Karnataka	26746	24182	12430	1792145
Tamil Nadu	8435	6597	2631	286380
Kerala	1789	1431	354	121840
Puducherry	443	198	139	59450
Goa	680	252	52	38550
Total	38093	32660	15606	2298365

Table 62 : List of organizations having linkage and collaboration with KVKs

Sl.No.	Organization / Departments
1	Agriculture department
2	State government departments and schemes
3	Non- governmental organizations
4	Horticulture department
5	Panchayat raj institutions
6	State Agricultural Universities
7	Central government departments and schemes
8	National Bank for Agricultural and Rural Development
9	Financial institutions
10	Veterinary and animal husbandry department
11	ICAR institutions
12	Mass and print media
13	Farmers associations and groups
14	Fisheries department
15	Agricultural Technology Management Agency
16	Watershed department
17	Sericulture department
18	District collector's office
19	Nehru Yuvak Kendra
20	Forest department
21	Agricultural Engineering Department
22	District Industries Centre

testing campaigns and joint implementation of innovative projects like precision farming

- Provide technical back up for implementing RKVY, NHM and ATMA programmes, farm school, organize in-service training to field functionaries
- Serve as member, watershed implementation committee, district level farm improvement committee, flood /drought assessment team, yield

performance assessment team

- Participate in gram sabha meetings, agriculture production council meetings, farmers grievances redressal meetings
- Serve as resource persons in the off campus training programmes of the department, workshops, seminars, SAMETI Activities
- Provide farm advisory services, help in input procurement, supply seeds and planting materials, agricultural exhibitions and seminars at block and district level.

2. State Government Departments/Schemes

- Data base on beneficiaries of various schemes and preparation of vision plan for the district
- Financial support for projects of KVKs in the areas of vocational training, organize study tour, technology dissemination and video conferencing
- Third party evaluation of State Government schemes
- Establishment of farm machinery banks for custom hiring, soil and water conservation in KVK farm as well as in farmers fields in KVK cluster villages
- Purchase of seeds and planting material of KVKs
- Trainings & exposure visits on non-conventional sources of energy including bio fuel
- Scouting and documentation of farm innovations

3. Non-Government Organizations (NGOs)

- Conducting training programme, PRA , technical support

- Collaboration for conducting training programmes, local support for Farmers Field School, field days, seminars and for arranging melas.
- Organizing and conducting PRA, rural survey, off-campus training, conducting of demonstrations on crops, linkages for processing and value addition
- Support KVK in organic farming and group approach
- Project formulation and technical assistance for starting micro enterprises
- Collaborative linkage to conduct vocational trainings on income generation activities to their SHGs

4. Horticulture Department

- Joint diagnostic survey, training farmers and extension functionaries, implementation of NHM and NHB activities, precision farming programme, post harvest technology and value addition
- Collaboration for conducting training programmes, campaigns, bimonthly workshops, exhibitions, field days, seminars
- Participation in kharif and rabi campaigns, meetings, conducting FLD, OFT, training
- Guidance to students for their Rural Horticultural work experience programme
- Farm advisory services
- Participation in mass contact programmes, flower shows

5. Panchayat Raj Institutions - Village/Gram Panchayat and Zilla Panchayat

- Support in identifying the farmers and conducting KVK mandatory programmes, conducting farm school
- Sponsoring trainees, financial assistance for the continuation of group approach to solve problems that need community mobilization and organizing soil testing campaigns
- Infrastructure development, trainings for self

employment among youth and women, development of implements

6. State Agricultural Universities

- KVK gets technical, financial and administrative support in developing infrastructure facilities
- Help KVKs in selection of OFT, FLD, latest viable technologies, material for field trials, pre trial test of new varieties in KVK farms, supply of critical inputs for selected technologies, technical back-up and exposure visits
- Participate in SAC meetings and workshop organized by KVK
- KVKs provide feedback on researchable issues received from ATMA
- Participate in SAC meetings and help KVK in implementing suggestions related to technical problems

7. Central Government Departments, Ministries and Schemes

- Financial assistance for plant health clinic & seed production unit, infrastructural development of KVK
- Technological backstopping and revamping the farm activities of KVK
- Guide the local officials in implementing central government scheme by facilitating better understanding of schemes guidelines
- Linking entrepreneurs to schemes and facilitate them to avail subsidy and other scheme benefits
- Collaborative training programme on food grain storage, FFS etc.

8. NABARD

- Assistance for conducting trainings, village adoption & for income generating activities of trainees, formation of farmers groups
- Collaborating in entrepreneurship training programmes
- Financial support for research project under rural



KVK-NABARD monthly interface meeting with farmers

innovation fund & farmers technology transfer fund and funding of VVV Clubs formed by KVK

- Agriculture and rural credit assistance, loan for setting up of Agri clinics.

9. Banks, Cooperatives and Financial Institutions

- Extend financial assistance to SHGs formed/trained by KVK to establish small scale enterprises
- Provide assistance for conducting trainings, exposure visits, village adoption, field days, seminars and entrepreneurship development programmes
- Funding of kisan melas organised by KVK and extending loan to KVK beneficiaries
- SBI-KVK loan window opened at the KVK for assisting self employment pursuers in agriculture sector, assistance in conducting farmers' science congress
- Participate as resource person in entrepreneurial development programmes
- Guidance to agri clinic cum mini soil testing labs maintained by the PACS
- Support KVK infrastructural development so that KVKs undertake capacity building of bank officials

10. Animal Husbandry Department

- Joint veterinary camps, participating in assistance to state control of animal diseases meetings, collaborative linkage for conducting camps and vaccination programmes
- Technical assistance in demonstration, OFT, data related to livestock population and problems, input for FLD
- Organize training programmes on IFS, cattle rearing, poultry, quail farming utilizing their expertise.
- Collaborate in implementation of RKVY project, activities relating to SAMETI
- Guidance to students for their rural agricultural work experience programme
- Farm advisory service
- Impact analysis

11. ICAR Institutes

- Participate in SAC meetings, extension functionaries training programme and guide KVKs in formulating the OFT and FLD programmes
- Source of technology, technical expertise and inputs to FLDs, OFTs and training
- Support KVK in conducting farmer scientist interaction, field visit for laying out OFTs
- Project support to resolve localized problem, soil fertility mapping and strengthen infrastructure facilities of KVK
- Establishing market linkage, formation of commodity groups
- Exchange of experts as resource person for training programme

12. Media

- Participating in farm radio programmes, wide publicity to KVK training programmes, broadcasting KVK's programmes, announcements, news, answers to questions raised by farmers to the Kisanvani wing of AIR, radio talks

- Telecasting farmers' field problem solving technologies, technology dissemination & publicity
- News coverage in news papers, publication of technical and popular articles in print media
- Success stories on KVK activities
- Participation in rural advisory committee meetings

13. Farmers Associations and Groups

- Publicity to collaborative activities, arrangements while organizing exhibitions, off campus training programmes, field days and other extension activities
- Arrange diagnostic services, chemicals, seeds and other input at reasonable rate on credit basis for initiating frontline demonstrations and OFTs
- Participation in farmers' day, Zonal Workshop, sponsored training, and skill up-gradation programmes
- Joint implementation, inspections and promotional meetings of successful technologies

14. Fisheries Department

- Farmers identification for conducting FLD on integrated fish farming, sponsoring KVK training programmes related to fisheries development, stunted fingerlings technology adoption and joint implementation and monitoring of departmental schemes
- Supply of fish fingerlings, cement rings for ornamental fish culture, amur common carp seed production

15. Agricultural Technology Management Agency (ATMA)

- Helping the KVK in assessing the training needs of the farmers in areas of crop improvement, production, protection and mechanization,
- Provide researchable issues and training needs of farmers and extension personnel to initiate appropriate technical interventions including



ATMA-KVK Linkage activity at KVK Pathanamthitta

feedback to research system, OFT, FLD, training etc.

- Collaborate in introduction and popularization of new crops and new practices in the district, carryout soil testing campaigns
 - Serve as technology dissemination centre for ATMA farmers and facilitate exposure visit to KVK farm
 - Financial assistance for construction of model nursery, organizing technology week, Farmers-Scientists interactions,
 - Help in commodity group identification and support them with technical and managerial skills
 - Identification of awardee farmers to get them organize farm schools, provide technical expertise during farm school interactions, kisan goathi etc.
 - Participate in ATMA Management Committee and Governing Body meetings
- ### 16. Watershed Department
- Conducting training programmes, joint diagnostic survey, IFS demonstration, seminars and field days
 - Conducting trainings to rural youth on entrepreneurship development programmes
- ### 17. Sericulture Department
- Technical resource, identification of beneficiaries



for trainings, diagnostic survey

- Technical backstopping for training programmes, FLDs, formulation of OFTs
- Participation in SAC meeting, seminars and bimonthly technical workshop
- Dissemination of scientific techniques through mass contact

18. District Collector/ Dy. Commissioner's Office

- Financial support for KVK infrastructure and AV aids
- Participate in monthly review meetings of ATMA, NADP and IAMWARM Schemes, grievance day meeting, agricultural production council meeting, Special team constituted by district collector to evaluate the sugar factory effluent treatment and gravel quarry of plantations, periodical technical / consultative meeting
- Serve as member, micro irrigation committee, executive member - national food security mission committee

19. Nehru Yuvak Kendras

- Collaborative training programme for rural youth capacity building, sponsored training and identification of trainees

20. Forest Department

- Joint assessment of training needs of tree growers, joint diagnostic survey of field problems, collaborative training on importance of tree planting
- Technical resource and joint implementation of OFT/ demonstration, integrated waste land development programme, JFPM project etc
- Participation in vanamahotsava, supply of seedlings, planning, monitoring and follow up of various activities,
- Financial assistance for conducting training, seminars and workshops

21. Department of Agricultural Engineering

- Use of farm implements of agricultural engineering department in demonstrations and trainings,
- Joint implementation of training and demonstration, joint diagnostic survey, participation in farmers' seminars,
- Technical support and guidance, demonstration and exposure visits

22. District Industries Centre

- Organizing training programmes on EDP, monitoring of self employment/SSI units
- Collaboration in various tribal developmental programmes for the upliftment of the tribal population

3.1.12 Prosperity of farmers through technological interventions

3.1.12.1 Broiler goat rearing ensured livelihood security for the rural women: Pursuing timely endeavours and farmer friendly technologies through research, and answering to the very need of the farming community, Krishi Vigyan Kendra, Kozhikode has come up with a unique idea. 'Broiler Goat Rearing', fine-tuned by the KVK is a boon to the farming community especially in the areas where green fodder is scarce.

In this new technology, goat kids reared in sheds attain a better body weight and fetch remunerative income for farmers. This method benefits landless labourers and small farmers. Broiler rearing method is unique in itself. It is done by exploiting the high reproductive efficiency of female goats through proper planning and breeding, thus maintaining the quality of the offspring. At the same time to counter the scarcity of green fodder, a scientific and low cost feeding procedure is evolved.

As far as broiler goat rearing is concerned, there is no specific breed for this purpose. The kids (both male as well as female kids) of any breed can be selected and reared through this method. Under this method, 15 to 30 days old kids with a higher birth weight are selected before they start eating green leaves. These kids, once identified, are kept away from their mothers and are housed separately in sheds made of bamboo or wooden poles. Proper ventilation, sunlight and cleanliness are ensured at all the times.

Initially, the kids are given small quantities of concentrated feed, and the quantity is increased gradually depending upon the intake. Additional



A view of broiler goat

supplements such as liver tonic mixed with fish oil are also given twice a week. Pure water is a must and should be provided in the shed round the clock. Young kids are also provided with mother's milk for one month (twice or thrice a day) for their proper growth. The goat feed will be available in the market or farmers can also prepare feed mix by using locally available ingredients like de-oiled groundnut cake, horsegram, wheat or maize, rice or wheat bran, etc.

Kids bred under broiler technology gain about 25 - 33 kg in 120-140 days, whereas in traditional system of green feeding, the goats acquire only a maximum weight of 10 kg, that too in 6 months. The expenditure towards feeding a kid under this method comes to about Rs. 1200. A net income of Rs. 5050 to 7050 (at Rs. 250 per kg on live weight) can be easily realized.

Now this has become a flagship programme of the KVK. The success of this technology is not confined to Kerala alone. Farmers from Karnataka, Tamil Nadu, Andhra Pradesh and Gujarat are visiting these Self Help Groups to witness their success formula.

Video modules/technology capsule on broiler goat technology was developed and published in KVK website as well as youtube website. As an outcome this video was viewed by more than 75000 visitors across the world within a year. Visitors from more than 160 countries viewed this video and a farmer group from Tanzania has approached the KVK for undergoing a training programme.

3.1.12.2 Rural families make money from mushroom: The upper Kuttanad of Pathanamthitta district is known as rice bowl. In recent years, usage of combined harvester has been increased due to which farmers are leaving paddy straw in the field itself. The best alternative to make use of paddy straw, which goes waste and underutilized, besides feed for cattle is mushroom cultivation with *Calocybe indica* (milky) and *Pleurotus* (oyster) species. Further, there is a huge prospect for mushroom cultivation because the current production is nowhere near to the market demand. In this direction, Krishi Vigyan Kendra, Pathanamthitta has established mushroom spawn production lab with the support from National Horticulture Mission (NHM). KVK trained farmers to establish spawn production units by more than 100 participants since 2008. Subsequently NHM sanctioned a project entitled Sustainable



Mushroom Production System in Pathanamthitta district which was implemented by KVK in the district.

KVK has successfully assessed different substrates for oyster and milky mushroom production and conducted demonstrations on mushroom production with regular advisory services and field days. Further, KVK has organized a total of 1219 training courses on mushroom cultivation, spawn production and value addition for the past 5 years wherein 3471 participants including farmers, women and youth were trained. KVK has produced a total of 6010 Kg of mushroom spawn from KVK unit and it was supplied to 250 farmers of small and medium units in the district.

Five clusters of mushroom growers consisting of 250-300 growers in the district viz., Parumala, Kuttoor, Othara, Azhiyidathucheera and Ranny were formed under the technical guidance of KVK. These clusters have been registered under The Travancore-Cochin Literary, Scientific and Charitable Societies Registration Act, 1955 [1] under the names Parumala Koon Ulpadana Sangham, Sree Bhadra Koon Ulpadana Sangham, Vikas Koon Ulpadana Sangham, Poornasree Koon Ulpadana Sangham and Snehadeepam Koon Ulpadana Sangham. The societies have about 22 mushroom producing units in all and are capable of producing oyster and milky mushroom and branded mushroom and its products.

The spawn production and distribution has solved the problem faced by mushroom farmers who had to travel a long distance for getting spawn. The spawn production and supply has created an opportunity of extra income for the women folk involved. The confederation of mushroom growers in Pathanamthitta is formed under the name Edanadu Mushroom Growers Association, Pathanamthitta. The association includes all the five societies registered under the project, and individual or any farmers clubs members who are willing to work for the objectives of the confederation. Twenty one members have signed the memorandum of association. As a result, mushroom production has been enhanced in the district by 2000 kg/month, spawn production in the district by 750 packets/month and employment man days by 750/month.



A view of mushroom production unit established by women SHG in a cluster

Further, developed packaging system for fresh mushroom and processed mushroom products. Launched the branded fresh mushroom and processed mushroom products under the brand name “Edanadu mushroom”. The processed products include pickle, frozen cutlets, dehydrated mushroom and mushroom powder. Now a well equipped mushroom technology display unit has been set-up at KVK campus to cater to the increased demand for mushroom training. KVK has also identified master trainers for technology spread.

3.1.12.3 Climate resilience for paddy cultivation at Wayanad

Adverse agro ecological situations due to unscientific paddy land utilization, land conversion and fallowing of paddy fields, high labour wages and dearth of skilled labour were addressed by KVK, Wayanad by popularizing advanced and appropriate farm machineries in the district especially for paddy and to form a full-fledged *techno-group* who does the operation, maintenance, service and repair of all farm machinery. This was tuned to synergize and supplement the development interventions of various local bodies and departments. It serves as catalyst for labour diversification and custom hiring.

KVK Wayanad introduced pedal pumps and conducted frontline demonstrations at Vellamunda, Sultan Bathery and Ambalavayal to popularize the device as an alternative to provide climate resilience in summer

fallow cultivation and family farming in Wayanad where irrigation facilities and energization limits cultivation even in places with assured water. This foot operated treadle pump sits on top of well or near the water body. Pumping is activated by stepping up and down on treadles which drive pistons. 1.5 inch flexible hose suck water from deep well, ponds, canals and rivers. Water output is approximately 0.8 to 1.5 litres per second, nearly 2800 to 5400 litres/hour. Treadle pumps reduce farmers dependency on rainfed irrigation. It enables the farmers to grow crops which they were not able to grow earlier. It is gender friendly and is best suited for family farming in summer fallows by women SHGs and farmer interest groups. The technology was well accepted in family farming and children supported their parents engaged in farming by operating pedal operated pumping devices. Two local bodies have included this as a major component in women specific schemes. This has triggered a new family farming culture and has changed the cropping pattern in summer fallows of the district by bringing more areas under vegetable and pulses after single rice crop.

Pedal pumping technology was adopted by ATMA as a demonstration component and KVK could popularize this to 460 farmers in various districts of Kerala through respective Krishibhavadans. Linkage with ten NGOs in the district helped the KVK to cover 25 acres under this system. Besides the treadle pump, KVK also included SRI technology, drum seeder



A view of pedal pump



Harvest festival of paddy

and new varieties of paddy. Tribal women labourers were trained in SRI system helped farmers to raise drought tolerant varieties in fallow areas. By the use of pedal pumps, more areas in summer fallows could be brought under cultivation. Use of drum seeder could reduce cost of cultivation by Rs.10000/ha. A skilled labour team to popularize SRI system was trained and empowered.

KVK also conducted a brainstorming and evolved drought management strategies in Wayanad. Consequently Bhagya - a rice variety with 100 days duration and early drought tolerance was tested for the first time in the district adopting SRI technique.

3.1.2.4 Nursery and cut flower production - a profitable venture for unemployed rural youth

Availability of natural resources like diverse agro-climatic conditions permit production of some of the temperate and tropical flowers, throughout the year in some part of Kanyakumari District. Commercial floriculture has emerged as a viable agri-business option for rural youth and women largely due to the efforts of KVK Kanyakumari. KVK has built capacity on nursery and cut flower production techniques among members of women SHGs and rural youth of Kanyakumari District since 2004 through vocational trainings, demonstrations and exposure visits to well established nurseries and cut flower units. During the training, technology and skills involved in nursery production viz., selection of site, planning and layout of nursery, media and containers for propagation of nursery plants, nursery



bed preparation and pro tray nursery raising, seed treatment and sowing, maintenance of seedlings, propagation through cuttings and layering, grafting and budding and micro-propagation were imparted. To promote cut flower production, orchid, *Anthurium*, *Heliconia*, *Gladiolus*, and tube rose crops were promoted under open conditions as well as shade net conditions in the district. Technological backup on selection of planting material, seed treatment, planting techniques, nutrition, weeds, water and shade management, plant protection, harvest, post harvest handling and packing techniques were imparted to the flower growers.

The efforts of KVK on nursery and cut flower production has motivated two SHGs and four individuals to start their own production units. In the case of SHG, the work and profits were shared among the members. The SHG (Agastiar Sanjeevi Vana Muligai Group) started a nursery unit in an area of 40 cent with the buy back arrangement of their produce during 2005-06 under the technical guidance of KVK. They are producing the nursery plants on order and getting approximately a monthly income of Rs.2200 per member. Apart from producing nursery plants they are maintaining more than 120 high value medicinal and ornamental plant species viz., Kacholam, Vilvam, *Plumbago*, *Ravolfia*, Neelamari, Stevia, *Aloe vera*, *Alpinia* and Vettiver, and forest tree species like teak, *Jatropha*, *Calophyllum* and *Albizia*.

Surya SHG of Pechiparai started rubber nursery in an area of 16 cents during 2006-07 and earning Rs. 16000 each member in a year. During 2005-06, Mr. Sasikumar, Sarode, Thuckalay has started a nursery unit (Indira nursery gardens) for the production of ornamental plants, casuraina, jasmine and cut flowers like heliconia and orchids. Apart from nursery plants he is also producing cut flowers like *Heliconia*, *Orchids* and *Anthurium* and earning an average of Rs. 7500 per month. During 2006-07, Mr. C. Sugumaran, a tribe from Orunooranvayal village has started a nursery unit for the production of rubber and medicinal plants. He is earning income up to Rs.52000/year. During 2009-10, Thirumathi. L.S. Little flower, Puthukadai has started a nursery cum cut flower unit in an area of 75 cents at

Karakonam cultivating some choice varieties of *Heliconia*, *Orchids* and *Anthurium* which are preferred mainly for export market. During 2010-11, Mr. Vijayakumar has started a nursery unit at Azhagamandapam (Deepam Nursery Gardens) in an area of 30 cents and is earning Rs. 5200/month. These nursery units and cut flower production units not only created self employment but also providing employment opportunities to labourers throughout the year.



A view of cut flower production unit in Kanyakumari district

3.1.12.5 Sustainable Sugarcane Initiatives- a boon for sugarcane growers

Sugarcane is one of the major commercial crops in Salem district and is being cultivated under 16687 ha. Normally, the sugarcane crop has been cultivated under traditional method with two budded sett cuttings, closed spacing and flood irrigation methods with the average yield ie., 35 to 40 t per acre. Farmers are struggling to get profitable income from sugarcane due to increased cost of cultivation on labour, input and harvesting etc. In this situation, KVK, Salem has introduced Sustainable Sugarcane Initiatives (SSI) among the sugarcane growers through series of activities like intensive training on SSI. Technologies like single bud chip raised in the SSI nursery, wider spacing (5 x 2 feet instead of 3X2), removing of centre shoot for stimulating the tillers, INM, and IPM were performed among the farmers, farm women and rural youth. KVK interventions has resulted in establishment of 20 SSI nurseries in and around Salem district for

supplying the critical input of single budded seedlings. Frontline demonstrations on SSI were also conducted at Omalur Taluk of Salem district among six identified progressive farmers. KVK scientists were present in all the critical stages to advise and support the farmers to adopt the SSI technologies.



Adoption of SSI Technology in Salem district

Out of the farmers, Mr.Ramachandran, Ulakkur, Jodukulli village of Omalur has shown remarkable achievement in sugarcane cultivation by following SSI technologies. He had cultivated sugarcane in one acre under SSI. He had obtained 62 t per acre under SSI technologies as compared to 40 t per acre from conventional method. This result was shown to the farmers through field days and training in his field. The cane harvested in SSI had higher single cane weight, bigger size of inter node and increased millable canes.

The SSI success stories were popularized through NADP sponsored training to farmers and cane officers and publication through newspapers and magazines. As a result, the SSI area has increased from 10 % to 25 % area in Salem district during the past 4 years (Fig.17).

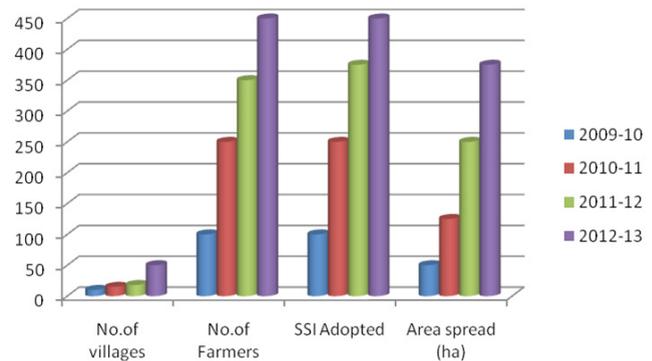


Fig.17: Adoption of SSI Technology in Salem district

3.1.12.6 Tea harvesting machine- overcome the labour shortage

Harvesting is one of the most important operations in tea done throughout the year. Proper plucking decides the quality of the tea produced and 70 per cent of the labour is utilized for plucking alone. Mostly women pluckers are engaged for this purpose. Hand plucking, shear plucking and mechanical plucking are the different methods of harvesting. There are two seasons for harvesting namely high cropping and lean cropping. Sixty five percent of leaf is harvested during high cropping season and thirty five percent in lean season. During rush crop, to overcome the labour shortage, machines are used for harvesting. In this direction, KVK, The Nilgiris has introduced machine harvesting of tea through series of activities since 2000. Mr.M.Munuswamy an innovative farmer of Wellington, Coonoor was trained by KVK which encouraged him to procure manually operated plucking machines for harvesting tea.

The plucking average in manually operated machine is 210kg/worker/day for six hours. The cost of harvesting green leaf by using manually operated machine is Rs.2/kg as compared to hand plucking which costs about Rs.5/kg considering about 30kg/day/worker. Due to heavy labour scarcity prevailing in the district and high cost of production, Mr.Munuswamy started using mechanical shear with which he is able to harvest at proper interval and is also getting quality green leaf. The output of the machine is 1200 kg/six hours.

The manually operated machine knife support blade is normally made up of aluminium and is fixed

with more than 10 number bolts and nuts. Since the knife supporting blade is having more bolt and nut the movement of blade was restricted and caused poor cutting, in order to increase its efficiency, he refined it by changing the aluminum blade into stainless steel support blade and reduced the number of bolt and nut from 10 to 3. Through this refinement, he is able to harvest 350 kg per hour, as compared to 200kg/hour before refinement, this increased the output of the machine to 900kg/day. Through this he could save 4.5 labours, 4.5 litres petrol and 180 ml of oil per day. This apart, the stainless blade saved one fourth of maintenance cost per year from Rs.50000 to 16380/ year through longer extended life of harvesting blade. He has disseminated this technology to 130 farmers who are still following this refinement and managing the labour scarcity.



A view of tea harvesting machine in The Nilgiris district

3.1.12.7 Development of Biofuel Growers' Market Network:

KVK Bangalore Rural has been associated with Rural Bio-Resource Complex (RBRC) project of UAS Bangalore. Promotion of biofuel was one of the 22 interventions evaluated. Taking cue from its potential application and considering the use by farmers for their own needs, biofuel plantation and technological interventions were promoted to build the

Table 63 : Status of existing biofuel plants and production

Plant Species	No. of plants in different age group			Total	Seedyield (Kg)
	0-5 years	5-10 years	>10 years		
<i>Pongamia pinnata</i>	32540	21120	5534	59194	116,668
<i>Azadiracta indica</i>	4059	2535	1055	7649	2110
Total	36599	23655	6589	66843	118778

rural livelihood security with the following objectives:

- Ensure sustained source of income
- Build robust mechanism to generate oil and cake to meet the rural demand
- Creation of subsidiary employment for the rural youth
- Improve environment and ecology

Data were collected through Participatory Rural Appraisal (PRA) technique to know the existing type of biofuel species, number, age of plants and productivity. It was observed that there was good number of biofuel species with substantial production. The total number of biofuel plants existing in the project area was 66843 with an annual production of 118778 kg of seeds (Table 63). *Pongamia* topped the list of biofuel species in terms of number of plants and seed production with 59194 (83.75%) plants contributing about 116668 kg of seeds.

Few convincing programmes like training, campaigns and Vanamahotsava (afforestation programmes) were organized during the first two years to educate the people about the importance of biofuels. A total of 1663 farmers were made aware of through different programmes like training courses, campaigns, Vanamahotsava etc conducted by the KVK. Women Self Help Groups, local leaders and young farmers were empowered. The activity also involved local institutions such as panchayats, schools and milk producers cooperative societies.

After raising the seedlings in the early monsoon, KVK managed to link planting programme through Milk Producers' Cooperative Societies (MPCSs) of the area by involving mainly farm women who are also the

members of MPCSSs. As part of continuous programme, a large scale planting of biofuel species was undertaken on degraded lands, school premises, road side and bunds. A total of 58417 plants were planted of which great demand for *Pongamia pinnata*, which accounted for maximum plantation (56400 plants) followed by *Azadiracta indica* (1983), *Bassia latifolia* (28) during 2007-08 to 2011-12.

The successful planting of biofuel tree species gave strong impetus to form 'rural biofuel growers association' with core activities of procurement, processing, better price and assured local market for seeds. The association established a functional linkage with KVK Bangalore Rural district, corporation bank, Karnataka state department of agriculture, Karnataka state road transport corporation, Indian Institute of Plantation Management, Karnataka state forest department and university of agricultural sciences, Bangalore.

The association established in an entrepreneurial model was encouraging growers to venture into value addition to their produce with additional economic returns

- The model consists of four additive phases viz.
- Promotion and production of biofuel feed stock
- Procurement of seeds from farmers
- Processing of seeds and oil expelling
- Marketing of oil and cake



Inauguration of Rural Biofuel Processing Unit by HE Governor of Karnataka

The growers were able to coordinate not only production related activities but also processing and marketing of the produce. As a result, the association has started the rural biofuel processing unit with an oil expelling machine at Hadonahalli, Doddaballapura taluk of Bangalore Rural district during March 2008. The size of the oil expelling plant was decided considering the present production of biofuel seeds in the area. The processing capacity of the unit is about one ton per day.

The initial cost of establishment of extraction plant including recurring and non-recurring cost was about Rs.7 lakh. Membership fee at the rate of Rs.100 was collected from the growers, while 49 milk producers' cooperative societies were convinced to contribute each a sum of Rs.2,000. The 12 executive committee members were motivated to contribute each a sum of Rs.10000 as chief promoters.

The procurement of seeds initiated by utilizing the existing 49 Milk Producers Cooperative Societies (MPCSSs) spread over in 75 villages. The seeds were procured through MPCSS once in three days at a specified time during harvesting period. Procured biofuel seeds were then consolidated at the biofuel processing unit for further processing. The payment was made through MPCSSs with provision for commission @ 5 per cent of total transaction amount (3% to the secretary and 2% to the society) for facilitating procurement of biofuel seeds. At present the seeds are procured @ Rs. 20 per kg which is four fold higher than the earlier



Visit of DG, ICAR and Vice Chancellor, UAS (B) to Rural Biofuel Processing Unit

price. The details of turnover on biofuel extraction plant are presented in Table 64. The co-ordination between different activities in the process of production of biofuel has made the activity self-reliant and functioning effectively on its own by creating an employment opportunity for over 200 rural families.

Table 64: Details of turnover on biofuel extraction plant

Year	Gross Income	Expenditure	Net income
2008-09	665878	645115	20763
2009-10	586221	430273	155948
2010-11	376408	331006	45402
2011-12	444201	397943	46258
Total	2072708	1804337	268371

3.1.12.8 Productivity Enhancement in Sericulture through Cluster Approach

Chickballapura and Kolar are the major silk producing districts of Karnataka. Though, sporadic attempts were made in India to improve the quality of raw silk, a comprehensive approach like integrating large scale uniform cocoon production, large scale conversion of cocoon to quality raw silk and silk fabric manufacturing has not been tried. But, there is a scope to improve the yield levels and quality of raw silk to remain competitive in the free trade era. Hence, a project has been designed and implemented by KVK Chikkaballapur with the support of RKVY during 2011-12 with an objective of promoting community cluster approach in silkworm rearing to produce uniform quality cocoons, to encourage rearing of bivoltine breeds and to design and install efficient silk reeling and weaving units to produce high quality raw silk and standard fabric. A few representative villages of Chickballapura and Kolar districts were selected to promote high yielding and high quality silkworm hybrid rearing.

Kathariguppe a village in Chintamani taluk with more than 60 sericulturists were selected to promote community cluster approach in enhancing production, productivity and quality cocoon production and further to convert cocoons into quality silk and fabric. Under RKVY, firstly a sangha was formed and registered as *Kathariguppe Bivoltine Reshme Belegarara Sangha*



A view of sericulture unit through a cluster approach

involving all the sericulturists in the village during December 2011. Secondly, the members of the Sangha were given technical and financial support required for Bivoltine silk production. An amount of Rs.10 lakh was spent from the project to modify the mulberry gardens, silkworm rearing houses and equipment for scientific rearing (given to Sangha). All the members of the Sangha started rearing Bivoltine hybrids after affecting modifications to the mulberry gardens and silkworm rearing houses. Appropriate production, grading, packing and marketing technologies are being adopted by all the members of Sangha. Totally 34 crops were harvested in the cluster village by 22 farmers (12 farmers completed two crops) with an average cocoon yield of 64.4 kg/100 DFLs and the total cocoon production in 10 months time is about 25000 kg. With an average price of Rs.230/kg, approximate returns was Rs.5750000. The Bivoltine cocoon productivity was

20 per cent more than the productivity of the taluk for the corresponding period.

The returns per unit area has almost doubled and the cluster village farmers are happy and continuing the practices on their own with minimal technical support from the project. Based on the success of this effort, several sericulturists from various villages have come forward to adopt the technologies being adopted by the members of *Kathariguppe Bivoltine Reshme Belegarara Sangha*. The Sangha is serving as a local resource centre to transfer Bivoltine production technologies to other villagers in the district.

In addition, a second cluster village Lakshmiddevakote was identified in which 15 farmers with 16.25 acres of mulberry plantation were provided technical support. The identified farmers have been trained on quality aspects of different activities such as, mulberry production, rearing house management, chawki handling, silkworm rearing, compost production, harvesting and grading of cocoons. This has created a huge impact as evident by the fact that a total of 6175 DFLs were brushed yielding 4893.86 kg of cocoon with average yield of 79.25 kg per 100 DFLs.

3.1.13 Awards and recognitions

3.1.13.1 Best Zonal Krishi Vigyan Kendra award 2011: KVK Calicut was conferred with Best KVK award of ICAR for Zone VIII for the year 2011 based on the outstanding achievements in the field of agricultural extension. The award was in recognition of the role played by the KVK in developing role models



KVK Calicut receiving award

and leader farmers as well as women SHG's who have started various successful agricultural related enterprises such as mixed farming, commercial plant nurseries for self-employment, vermicompost units, pisciculture, dairying, backyard poultry, farm mechanization etc. For "on hand" experience, 14 demonstration units are maintained by KVK in various enterprises. For the benefit of farmers and researchers, KVK has documented 18 indigenous technologies practiced by the local farmers. The award was presented by Union Minister of Agriculture and President, ICAR Society during the Award Ceremony on the occasion of AGM of ICAR held in New Delhi on 16 July 2012.

3.1.13.2 Krishi Shiksha Samman award for 2012: Krishi Vigyan Kendra, Dhramapuri, Tamil Nadu has bagged the prestigious Krishi Shiksha Samman Award for 2012 instituted by Mahindra and Mahindra Limited. The award was instituted as a platform to recognize the purposeful contributions made by individual farmers and agricultural institutions. The award was given to KVK for introducing new brinjal Co (BH)2 hybrids through precision farming technology which led to reduction in seed rate by 30 to 40 percent, savings on labour and irrigation costs by 50 per cent and improved shelf life of the produce by 5 to 6 per cent. It decreased the incidence of pest and disease and increased cropping intensity and yield.



KVK Dhamapuri receiving award

3.1.13.3 Other awards: Dr. N. Vijayakumar, Subject Matter Specialist (Agricultural Entomology) in KVK Puducherry has received Two National Awards viz.,



Dr. N. Vijayakumar,

SMS (Agricultural Entomology) receiving award

National Education Leadership Award for Integrated Pest Management and Rashtriya Vidhya Samman Puraskar for the growth of State Bio Control Laboratory and three international awards viz., Indo-Nepal Unity International Award, Gold Star Asia International Award and Global Achievers Development Award for his work on Bio-agents and Bio-pesticides in Integrated Pest Management by creating awareness on ill-effects of pesticides usage in biota.

3.2 Agricultural Technology Information Centres

The Indian Council of Agricultural Research (ICAR) established Agricultural Technology Information Centres (ATICs) during X Five Year Plan with the mandate of providing technology services, input services and information services to the farming community based on single window system. The state wise data base of ATICs established and functioning in Zone VIII are given in Table 65 and the services provided by these ATICs are given in ensuing paragraphs.

Table 65: Agricultural Technology Information Centres

States	SAUs	ICAR Institutes	Total
Kerala	1	4	5
Karnataka	2	1	3
Tamil Nadu	2	-	2
Total	5	5	10

3.2.1 Technology services: A total of 10314 farmers visited these ATICs out of which 5814 farmers visited

for technical advises, 2658 farmers came as part of study tours and 1245 farmers for purchase of technology inputs. A total of 12254 books and technical bulletins, 490 CDs, technology inventory, video films, audio CDs were made available for farmers at ATICs benefitting 12527 farmers and generated revenue of Rs.7.08 lakh for ATICs.

3.2.2 Inputs provided: Technological inputs provided to farmers by the ATICs include seeds (151549.60 q), planting materials (57940 numbers) and bio-products (111.6.5 q).

3.2.3 Information provided: ATICs replied 2871 letters received from farmers and answered 6364 telephonic calls to help farmers to clarify their doubts. ATICs also showed 1427 video shows to convince farmers on latest technologies. Besides, 4598 farmers were trained to build their skills to adopt innovative ideas and techniques promoted by the ATICs.

Through the above services, the ATICs have earned a total revenue of Rs.9685487.

3.3 Technological Backstopping by Directorate of Extension

KVKs are provided with enough technological backstopping in agriculture and its allied sectors through Directorate of Extension Education located in eight State Agricultural Universities viz., University of Agricultural Sciences Bangalore, University of Agricultural Sciences Dharwad, University of Agricultural Sciences Raichur, Karnataka Veterinary Animal and Fisheries Sciences University Bidar, University of Horticultural Sciences Bagalkot, Kerala Agricultural University Thrissur, Tamil Nadu Agricultural University Coimbatore and Tamil Nadu Veterinary and Animal Sciences University Chennai.

The Directors of Extension and their officials coordinate and monitor the mandated activities of all the KVKs under their jurisdiction through scientific advisory committee Meetings, workshops, review meetings, field visits, organize human resource development programmes for KVK staff on frontier areas of technologies. Further they also provide technological products like seeds, planting materials,

livestock, poultry and fisheries breeds to various KVKs as per their requirement.

During the year Directors of Extension and their officials have participated in 58 Scientific Advisory Committee Meetings, 63 field days, 49 training programmes and 12 Technology Weeks. In addition they have attended in 8 other programmes including farmers meet, animal health camp, inauguration of knowledge and resource centre in villages etc. They have also organized 30 workshops/seminars in which 587 KVK staff had participated.

Directorates of Extension have also monitored the activities of KVKs through 30 programmes including workshops/review meetings, action plan meetings, sensitization meetings, regional committee meeting, crop specific awareness programmes etc. In addition they also have made field visits to 81 plots wherein on farm trials were conducted, 102 plots of frontline demonstration and participated in 63 training programmes conducted by the KVKs, 77 extension activities and 23 Farm Field Schools programmes.



A view of sensitization meeting organized by DE, UAS, Bangalore

Further they have also assisted the KVKs for preparing 10 documents on success stories / case studies.

In order to provide technological backstopping on latest technologies in agriculture and its allied sectors, the Directorate of Extension have also organized 40 training programmes in which 387 KVK staff have participated. The thematic areas covering these training programmes include dryland farming, processing and value addition, climate change effects and its management, market led extension management and market intelligence, participatory watershed management, extension strategies for promoting Integrated Nutrient Management, Integrated Pest Management and Integrated Disease Management, precision farming technologies, participatory seed production, forage production, conservation and utilization, role of livestock in Integrated Farming System, clean milk production, polyculture of fish for food and nutritional security etc.

Directorates of Extension also serve as source of technologies for the KVKs and provide technological inputs such as seeds of high yielding varieties and hybrids, planting materials, livestock and poultry breeds etc. During the year 155.9 quintals of seeds were mobilized /facilitated. In addition 2.06 lakh of planting materials, 15.45 quintals of bio-products, 89 livestock, 6 quintals of livestock products, 37662 poultry birds, 2.6 quintals of poultry products, 21 piglets, 17500 fingerlings and 2.86 quintals of nutrient mixture were also produced and supplied to various stakeholders.

3.4 Special Programmes

3.4.1 Pulse crop demonstrations

A total of 564 demonstrations on major pulse crops such as blackgram, greengram, pigeonpea and bengalgram covering an area of 229.20 ha were implemented in the pulse growing NFSM implementing districts of Karnataka and Tamil Nadu states under technology demonstration for harnessing pulse production in the country during 2012-13.

3.4.1.1 Kharif 2012

A total of 306 demonstrations on pulse crops namely blackgram (20), greengram (83), pigeonpea



(181) and field bean (12) covering an area of 130.8 ha were implemented in the pulse growing districts of Karnataka and Tamil Nadu states under technology demonstration for harnessing pulse production in the country during kharif 2012 (Table 66).

(i) Blackgram: 20 demonstrations on Integrated Crop Management practices in DU-1 and TAU-1 varieties of blackgram covering an area of 8 ha under rainfed condition were undertaken in Bidar and Gulburga districts of Karnataka state. The average yield increase was 24.38 per cent in demonstrations with an average yield of 11.93 q per ha as against 9.59 q per ha under farmers practice. The BCR recorded under demonstrations was 2.45 as against 2.20 under farmers practice.

(ii) Greengram: 83 demonstrations on Integrated Crop Management practices in Selection-4, BGS-9 and local varieties of greengram covering an area of 36 ha under rainfed situation were undertaken in five districts, viz., Tumkur, Belgaum, Bidar, Gulburga and Chitradurga of Karnataka state. The average yield increase ranged from 9.68 to 52.56 per cent with an average yield of 8.16 q per ha as against 6.43 q per ha under farmers practice. The BCR recorded under demonstrations was 2.99 as against 2.48 under farmers practice. In Tamil Nadu 10 demonstrations were conducted in Villupuram district under irrigated condition, which recorded an yield increase of 43.06 per cent with variety VBN-3.

(iii) Pigeonpea: Demonstrations (191) on Integrated Crop Management practices in TS-3R, BSMR-736, BRG-1, BRG-2, LRG-41 and Asha varieties covering an area of 73.8 ha were conducted under irrigated and rainfed conditions in 9 districts of Karnataka and one district of Tamil Nadu states. The results indicated that an average yield increase ranged from 11.11 to 65.63 per cent under irrigated and 14.63 to 56.05 per cent under rainfed situation recording an average yield of 20.03 q per ha as against 15.23 q per ha in farmers practice under irrigated condition as compared to 11.79 q per ha as against 9.44 q per ha in farmers practice under rainfed condition in Karnataka state. In Tamil Nadu, LRG-41 variety of pigeonpea recorded an

increase of 27.78 per cent in yield under rainfed situation. The BCR recorded under demonstrations was higher in all situations as against farmers practice.

(iv) Field bean: 12 demonstrations conducted in Tumkur district of Karnataka under rainfed condition recorded an increase of 9.15 per cent in yield as against farmers practice with BCR of 2.80.

3.4.1.2 Rabi pulses 2012-13

A total of 258 demonstrations on pulse crops namely blackgram (56), greengram (35), bengalgram (167) covering an area of 98.40 ha were implemented in pulse growing districts of Karnataka and Tamil Nadu states under technology demonstration for harnessing pulse production during rabi 2012-13 (Table 67).

(i) Bengalgram: 167 demonstrations on Integrated Crop Management practices in JG-11 and GK-3059 varieties covering an area of 67.40 ha were conducted in 9 districts of Karnataka. The average yield increase was 23.15 per cent under rainfed with JG-11 variety, 36.10 per cent under irrigated with JG-11 variety and 12.96 per cent under irrigated with GK-3059 variety of bengalgram. The BCR recorded under demonstrations was higher in both the varieties under rainfed and irrigated conditions as compared to BCR recorded under farmers practice.

(ii) Blackgram: 56 demonstrations on Integrated Crop Management practices in VBN-4, VBN-6 and ADT-3 varieties covering an area of 17.00 ha were conducted in 3 districts of Tamil Nadu. The average yield increase ranged from 11.60 to 48.19 per cent under irrigated with VBN-4 and VBN-6 varieties and 19.05 per cent to 39.29 per cent under rice-fallows with ADT-3 variety as against farmers practice. The BCR recorded under demonstrations was higher in both situations as compared to BCR of farmers practice.

(iii) Greengram: 35 demonstrations on Integrated Crop Management practices in VRM (Gg)-1, ADT (Gg)-3 and Co-6 varieties covering an area of 14 ha were conducted in 2 districts of Tamil Nadu. The average yield increase ranged from 23.04 in VRM (Gg)-1 to 52 per cent in Co-6 variety under rice fallow

Table 66: : Effect of demonstraions in pulse crops during *kharif* season (2012)

KVK	Name of Variety	No. of farmers	Area (ha)	Average yield (q/ha)		% increase over check	B:C Ratio	
				Demo	Check		Demo	Check
Karnataka								
Blackgram (rainfed))								
Gulbarga	DU-1	12	5.00	11.25	9.10	23.63	2.95	2.49
Bidar	TAU-1	8	6.00	12.50	10.00	25.00	2.03	1.95
Weighted Avg.		20	11.00	11.93	9.59	24.38	2.45	2.20
Greengram (rainfed)								
Chitradurga	Local	25	10.00	4.84	3.78	28.04	2.21	1.59
Belgaum	S-4	20	8.00	5.37	3.52	52.56	2.68	2.94
Tumkur	S-4	12	5.00	8.50	7.75	9.68	2.63	1.32
Gulbarga	S-4	12	5.00	10.41	9.20	13.15	3.99	3.68
Bidar	BGS-9	10	6.00	15.00	11.25	33.33	3.84	3.17
Gulbarga	BGS-9	4	2.00	9.01	6.70	34.48	4.02	2.86
Weighted Avg.		83	36.00	8.16	6.43	30.11	2.99	2.48
Pigeonpea (Irrigated)								
Bellary	ASHA	25	10.00	23.65	18.85	25.46	3.61	3.02
Bidar	BSMR-736	10	4.00	26.50	16.00	65.63	5.03	3.86
Belgaum	TS-3R	10	4.00	9.52	7.15	33.15	2.49	2.95
Bellary	TS-3R	6	4.00	15.00	13.50	11.11	3.13	2.08
Weighted Avg.		51	22.00	20.03	15.23	31.55	3.58	2.99
Pigeonpea (rainfed)								
Tumkur	BRG-2	25	10.00	15.80	13.20	19.70	2.54	2.35
Chitradurga	BRG-2	25	10.00	10.60	8.30	27.71	2.22	1.79
Gulbarga	TS-3R	24	10.00	11.16	9.30	20.00	2.76	2.35
Koppal	TS-3R	20	8.00	8.13	5.21	56.05	2.28	1.56
Tumkur	BRG-1	10	5.00	11.75	10.25	14.63	2.30	2.25
Raichur	TS-3R	12	4.80	11.48	8.67	32.41	2.42	1.99
Gulbarga	TS 3R	4	2.00	16.25	13.75	18.18	2.27	2.04
Weighted Avg.		120	49.80	11.79	9.44	27.86	2.43	2.05
Field bean (rainfed)								
Tumkur	HA-4	12	5.00	7.75	7.10	9.15	2.80	2.32
Tamil Nadu								
Greengram (irrigated)								
Villupuram	VBN3	10	5.00	10.30	7.20	43.06	2.31	1.44
Pigeonpea (rainfed)								
Vellore	LRG41	10	2.00	8.05	6.30	27.78	2.03	1.75
Total		306	130.80					



Table 67: Effect of demonstrations in pulse crops during *rabi* season (2012-13)

KVK	Farming Situation	Name of Variety	No. of farmers	Area (ha)	Average yield (q/ha)		% increase over check	B:C Ratio	
					Demo	Check		Demo	Check
Karnataka									
Bengalgram (rainfed)									
Gadag		JG-11	25	10.00	11.12	9.24	20.35	2.44	2.17
Chitradurga		JG-11	25	10.00	11.25	9.00	25.00	2.28	1.72
Gulbarga		JG-11	24	10.00	13.95	10.80	29.17	4.45	3.66
Koppal		JG-11	20	8.00	18.65	15.85	17.67	2.55	2.05
Tumkur		JG-11	12	5.00	9.75	9.00	8.33	2.25	2.21
Gulbarga		JG-11	5	2.00	10.00	7.50	33.33	1.69	1.67
Belgaum		JG-11	5	2.00	9.75	7.50	30.00	2.63	2.11
Raichur		JG-11	5	2.00	12.80	9.80	30.61	2.58	2.22
Bellary		JG-11	6	2.40	14.30	12.70	12.60	4.69	3.27
Weighted Avg.			127	51.40	12.85	10.55	22.30	2.89	2.39
Bengalgram (irrigated)									
Belgaum		JG-11	20	8.00	19.97	14.60	36.78	4.40	3.67
Bidar		JG-11	15	6.00	18.25	13.50	35.19	3.96	2.95
Weighted Avg.			35	14.00	19.23	14.13	36.10	4.21	3.36
Bengalgram (rainfed)									
Bellary		GK-3059	5	2.00	61.00	54.00	12.96	3.60	2.57
Tamil Nadu									
Blackgram (irrigated)									
Villuppuram		VBN(Bg)4	20	4.00	12.30	8.30	48.19	2.20	1.67
Villuppuram		VBN(Bg)6	13	5.00	13.28	11.90	11.60	2.17	2.07
Tiruvannamalai		VBN(Bg)6	10	2.00	8.07	7.02	14.96	1.86	1.66
Weighted Avg.			43	11.00	11.79	10.51	12.56	2.08	1.95
Blackgram (rice fallow)									
Nagapattinam		ADT 3	10	4.00	1.95	1.40	39.29	1.09	1.02
Nagapattinam		ADT 3	3	2.00	2.50	2.10	19.05	1.47	1.40
Weighted Avg.			13	6.00	2.13	1.63	32.54	1.21	1.15
Greengram (rainfed)									
Tuticorin		Co-6	20	8.00	7.60	5.00	52.00	3.17	1.39
Greengram (rice fallow)									
Tiruvarur		ADT-3	10	4.00	3.92	3.11	26.05	10.57	8.89
Tiruvarur		VRM (Gg) 1	5	2.00	7.69	6.25	23.04	3.08	2.50
Total			258	98.40					



Pigeonpea (TS-3R)



Bengalgram (JG-11)



Greengram (BGS-9)



Pigeonpea at flowering stage



ICM in blackgram



ICM in greengram

Demonstrations on pulse crops



conditions. The BCR recorded under demonstrations was higher as compared to BCR achieved with farmers practice.

3.4.2 National Initiative on Climate Resilient Agriculture (NICRA): Climate change has become an important area of concern for India to ensure food and nutritional security to the ever growing population. Though a focused and long term research is required to find solutions to the problems specific to the country, there is a scope to improve the resilience of agriculture by application of existing knowledge and technology on farmers' field as a holistic package. In this backdrop, a scheme on National Initiative on Climate Resilient Agriculture (NICRA) is being implemented in the country to develop improved technologies through short term and long term research has also a demonstration component to demonstrate the existing technologies with National Agricultural Research System (NARS) to cope with climate variability on farmers' fields in 100 most vulnerable districts selected across the country. In Zone-VIII, 9 most vulnerable districts namely, Chikkaballapura (drought/heat), Davangere(drought/heat), Kolar(drought/heat) and Tumkur (drought) in Karnataka state, Namakkal (drought), Villupuram (drought/flood/cyclone), Ramanathapuram (drought/flood/cyclone/salinity) and Nagapattinam (drought/flood/salinity) in Tamil Nadu state and Alleppey (water inundation/drainage) in Kerala have been selected and programme being implemented through KVKs of respective districts w.e.f from 2010.

The interventions being implemented are based on four modules, i.e (1) crop production, (2) natural resource management, (3) livestock and fisheries, and (4) institutional. Besides, capacity building (HRD) to participating farmers on the tools and new technologies to be adopted to mitigate the climate related adversaries in crop production and animal husbandry is also being addressed. The salient achievements during 2012-13 are detailed as under:

Module I: Natural resources

This module consists of interventions related to *in-situ* moisture conservation, water harvesting and recycling for supplemental irrigation, improved drainage

in flood prone areas, conservation tillage where appropriate, artificial ground water recharge and water saving irrigation methods. During the year, 714.01 ha area has been treated with NRM related treatments covering 888 farmers in 9 selected villages under NICRA. The details are presented in Table 68.

Module II: Crop Production

This module consists of introducing drought/temperature tolerant varieties, advancement of planting dates of rabi crops in areas with terminal heat stress, water saving paddy cultivation methods (SRI, aerobic, direct seeding), frost management in crops through fumigation, community nurseries for delayed monsoon and location specific intercropping systems. During the year, 1264 demonstrations were carried out in an area of 261.16 ha in nine selected villages. The per cent increase in yield due to demonstration of flood/drought/temperature tolerant varieties ranged from 12.40 per cent in aerobic paddy to 51.73 per cent in PMK-1 variety of chilli. The increase in yield due to advancement of planting dates of rabi crops in areas with terminal heat stress ranged from 21.67 per cent in greengram to 36.81 per cent in bengalgram. Water saving technique in paddy cultivation recorded an increase of 17.24 per cent in yield with BCR of 2.49. Similarly, frost management, community nurseries, location specific intercropping systems also gave higher yields with higher BCR under demonstrations as compared to their local checks. During the year, 119 ha area has been planted with tree saplings in NICRA implementing area in 9 villages. The details are given in Table 69.

Module III: Livestock and Fisheries

Use of community lands for fodder production during droughts/floods, improved fodder/feed storage methods, preventive vaccination, improved shelters for reducing heat stress in livestock, management of fish ponds/tanks during water scarcity and excess water, etc., are the activities carried out under the module. KVKs of Zone-VIII have covered 6516 number of improved breeds of animals with vaccination, deworming, nutrition, disease management, insurance, breed upgradation, 205 poultry birds, 154 units of fodder



Drought tolerant finger millet (ML 365)



Temporary water storage pond for fish culture



Animal health camp



Mobile sprinkler to reduce frost damage in onion



Drought tolerant pigeonpea (BGR 2)



Finger millet + Pigeonpea

Technological interventions in NICRA villages



Table 68: Details of NRM activities implemented under NICRA by KVKs

Interventions	Technology demonstrated	No. of farmers	Area (ha)
Water harvesting and recycling for supplemental irrigation	Desilting and widening, concrete water storage structure, soil water conservation through land leveling, farm ponds, renovation of old farm ponds, temporary water storage pond	303	148.5
<i>In-situ</i> moisture conservation	<i>In-situ</i> green manuring, mulching with the sugarcane trash, summer ploughing, contour bunds, leveling and making compartments, tank silt application, trench cum bunding, ploughing across the slope etc.	219	121
Water saving irrigation methods	Drip/sprinkler irrigation, fertigation system, mulching of the sugarcane trash and use of sprinkler method, cultivation on broad bed and furrow	115	111.2
Improved drainage in flood prone areas	Strengthening and renovation of defunct drainage channel	110	250
Artificial ground water recharge	Recharge of bore wells/open wells, injection well, trench cum bund making	67	74.11
Conservation tillage	Conservation tillage, broad bed furrow	26	7.2
Management of problematic soil	Integrated Crop Management for sodic soil in rice, soil amendment for rice in problem soil	10	2
Recycling of organic residues for energy generation and crop production	Portable biogas plant	26	26 units
Farm waste management	Compost pit	7	NA
Popularization of silpaulin vermibag	Soil health improvement	5	NA
		888	714.01

storage, housing for poultry, improved breeds of poultry for higher egg production, integrated fish and duck farming and improved shelter for livestock and 16.05 ha improved fodder cultivation in the community lands of selected villages during drought period benefiting 2302 farmers under NICRA during 2012-13. The details are furnished in Table 70.

Module IV: Institutional interventions

This module consists of institutional interventions relating to seed bank, fodder bank, commodity groups, custom hiring centre, collective marketing group, introduction of weather index based insurance and climate literacy through a village weather station. In all 9 villages, 106.64 ha area was developed as seed bank and 28.7 ha as fodder bank to meet the drought related situations. About 19 commodity groups were formed in the villages for better coordination in technology adoption. Custom hiring centres established in all 9 villages provided required farm implements to 1131

farmers to carry out timely farm operations besides reducing the cost of cultivation. KVKs also provided climate literacy through village level weather station to 298 farmers. The details are given in Table 71.

Capacity building

Need based training was given to farmers on tools and technologies for mitigating climate related adversaries in crop production and animal husbandry. Besides, capacity building of participating farmers was done through short term exposure visits to research stations, model farmers' fields and other organizations involved in agriculture and animal husbandry development. During the year 154 training courses were organized training about 2808 farmers in all the 9 NICRA villages under Zone-VIII. The details are given in Table 72.

Extension activities: In order to create awareness among the farming community on latest technologies and tools, 320 extension programmes were organized

Table 69: Details of crop production activities implemented under NICRA by KVKs

Technology demonstrated	No. of farmers	Area (ha)	Yield (q/ha)			BCR	
			Demo	Check	% increase	Demo	Check
Introduction of flood/drought/temperature tolerant varieties							
Greengram (VBN 3, S-4)	274	12.00	7.10	5.45	32.51	2.09	2.01
Ragi (MR-6, KMR-204, ML-365, GPU-48)	113	44.00	20.52	15.83	28.38	2.54	1.79
Redgram (BRG-1, BRG-2, TS-3R)	85	21.44	11.41	9.34	23.34	2.73	2.19
Onion (Valayapatti local)	72	10.00	150.00	120.00	25.00	4.96	3.66
Vegetable seeds production: PKM 1 (moringa) and Co 1 (chili)	65	5.00	179.00	145.00	24.00	2.42	1.81
Sorghum (CO-30)	40	5.20	29.00	22.00	31.80	2.76	2.10
Groundnut (TMV-7, TMV-13)	32	9.90	18.86	15.55	21.09	2.69	2.22
Sesame (TMV (Sv) 7)	10	1.00	7.43	6.21	19.60	2.40	2.07
Blackgram (Co 6)	18	2.12	8.55	7.20	18.70	2.19	1.89
Bajra (ICTP 8203, ICMV -221)	14	8.40	8.75	6.50	26.81	3.04	2.92
Soybean (JS-335, JS- 9305)	8	4.60	27.50	24.10	14.17	3.85	3.70
Bitter gourd (Co-1)	6	1.60	80.00	62.00	29.00	1.80	1.44
Horsegram (GPM- 6)	6	4.40	8.00	6.50	23.10	1.89	1.93
Jasmine (Ramanathapuram gundu)	6	1.50	52.00	38.00	36.00	2.48	1.85
Aerobic Paddy (MAS-26)	5	2.00	33.50	29.80	12.40	2.13	1.87
Paddy (Anna 4)	5	1.00	24.53	18.50	32.59	2.72	2.08
Chilli (PMK 1)	5	1.00	23.12	11.16	51.73		3.00
Snake gourd (Co-1)	5	1.00	120.00	97.00	23.00	2.48	2.02
Bottle gourd (Arka Bahar)	3	0.80	155.00	137.00	13.00	3.90	2.95
Castor (DCH 117)	2	0.80	26.00	18.00	44.00	2.96	2.08
Tuberose (Prajwal)	2	0.25	100.00	87.50	14.30	2.50	1.98
Total	776	138.01					
Advancement of planting dates of rabi crops in areas with terminal heat stress							
Bengalgram (JG-11)	5	1.20	19.97	14.60	36.81	4.41	4.17
Blackgram (VBN Bg 6/VBN Bg 7)	40	4.00	7.75	6.00	29.20	1.65	1.34
Greengram (VRM Gg 1/ADT 3)	15	4.00	90.85	73.8	21.67	2.17	2.02



Technology demonstrated	No. of farmers	Area (ha)	Yield (q/ha)			BCR	
			Demo	Check	% increase	Demo	Check
Water saving paddy cultivation							
Paddy SRI (ADT 45/White ponni)	7	10.40	60.19	51.23	17.24	2.49	1.96
Frost management							
Onion (rope method)	22	1.85	150	120.00	25.00	4.96	3.66
Groundnut	10	2.50	19.50	16.00	21.80	2.80	2.30
Total	99	23.95					
Community nurseries for delayed monsoon							
Redgram seedlings in poly bags (TS-3R)	5	0.40	10.25	7.50	36.66	2.60	2.57
Bittergourd (Co 1)	3	0.40	80.00	62.00	29.00	1.80	1.44
Bottlegourd (Arka Bahar)	4	0.40	115.00	137.00	13.00	3.90	2.95
Tomato	10	4.00	125.00	112.00	11.60	1.93	1.81
Total	22	5.20					
Location specific intercropping systems							
Groundnut + redgram	48	12.00	9.52	7.85	17.19	2.18	2.16
			+4.37				
Groundnut + redgram	2	1.40	9.50	8.40	13.00	1.98	1.75
			+1.85				
Maize + redgram	109	18.50	42.40	34.25	23.65	2.63	1.79
			+11.00				
Ragi + redgram	44	15.00	11.75	14.00	34.30	2.40	1.56
			+7.75				
Short duration cassava in coconut gardens	38	1.40	219.00	120.00	82.25	2.35	0.16
Total	241	48.30					
Integrated Crop Management							
Soil test based lime and fertilizer application in paddy	22	13.40	57.60	45.00	27.97	2.18	1.60
Drought tolerant fodder crops							
Fodder sorghum (Co Fs 29), Hedge lucerne and Agathi	64	7.30	1400.68	230.14	213.70	1.80	1.28
Nutrient management							
Water soluble fertilizers in cotton, Tree plantings	40	25.00	14.80	12.70	16.50	1.88	1.73
Grand Total	1264	261.16					
Sapota	2	1.00	-	-	-	-	-
Forest species (Melia dubia, Acacia, Tamarind, Amla, Mango, Silver oak, Teak)	9979	118.00	-	-	-	-	-

Table 70: Details of livestock and fisheries activities implemented under NICRA by KVKs

Intervention	Number/ha/unit	No of farmers
Preventive vaccination (number)	3463	725
Fodder crops (ha)	11.80	356
Deworming (number)	1840	283
Feed enrichment (number)	503	255
Use of community lands for fodder production during drought/floods (ha)	16.05	174
Animal health camp (number)	232	121
Management of fish ponds / tanks during water scarcity and excess water (ha)	2.85	70
Improved fodder/feed storage methods (units)	69	67
Feeding management and disease control programme in livestock (number)	60	60
Facilitation of milk marketing (units)	1	50
Cattle Insurance (number)	88	42
Housing of poultry in slatted floor to overcome flooded conditions (units)	30	30
Introduction of improved breeds of poultry for higher egg production (units)	25	25
Integrated fish and duck farming (units)	25	25
Breed upgradation (number)	122	9
Improved shelters for reducing heat stress in livestock (units)	2	2
Addition of Local Sheep to NARI suvarna (units)	2	2
Breed upgradation (number)	3	3
Backyard poultry (number)	205	3
	30.70 ha,	2302
	6516 animals and 154 units	

Table 71: Details of institutional interventions implemented under NICRA by KVKs

Interventions	Number/ha/unit	No. of farmers
Custom hiring centre (ha)	488.20	1131
Climate literacy through a village level weather station (ha)	100.00	298
Seed bank (ha)	106.64	422
Fodder bank (ha)	28.70	190
Seed production (ha)	12.00	30
Feed production (ha)	4.00	10
Commodity groups (number of groups)	19	145
Compost tank (units)	20	20
Vermicompost tank (units)	20	20
Bio gas (units)	10	10
Mushroom production (units)	6	6
Value addition of rice and coconut (units)	1	6
Bio digester (units)	3	3
Total	739.54 ha, 19 groups and 60 units	2291



Table 72: Details of Capacity building under NICRA

Thematic area	No. of Courses	No. of farmers		
		Male	Female	Total
Integrated Pest and Disease Management	19	272	97	369
Integrated Crop Management	18	224	108	332
Farm implements and machineries	15	73	14	87
Fodder and feed management	13	172	35	207
Employment generation	11	134	67	201
Crop diversification	9	39	33	72
Livestock management	9	156	79	235
Nutrient management	9	159	44	203
Natural Resource Management	8	105	22	127
Mechanization	6	65	4	69
Soil health and nutrient management	6	65	24	89
Hi-tech horticulture	5	35	110	145
Value addition	4	37	41	78
Animal nutrition	2	34	10	44
Climate changes	2	35	7	42
Contingent crops	2	92	17	109
Fruit crops production	1	50	0	50
Composting	1	13	0	13
Home Science	1	5	25	30
Honey bee rearing	1	17	2	19
Integrated Farming Systems	1	19	8	27
Improved shelter for poultry	1	2	18	20
Mushroom production	1	4	18	22
Organic manures	1	13	0	13
Pest management	1	27	0	27
Seed treatment	1	25	0	25
Soil and water conservation	1	50	0	50
Vermi-compost	1	8	5	13
Water harvesting	1	13	0	13
Water management	1	12	0	12
Reclamation of salt affected soil	2	60	5	65
	154	2015	793	2808

in which 3109 farmers participated and benefitted. The details are given in Table 73.

Table 73: Details of extension activities under NICRA

Name of the activity	No. of Programmes	No. of farmers		
		Male	Female	Total
Agro advisory services based on real time weather parameters	90	250	49	299
Field visits	74	83	15	98
Commodity groups	35	142	52	194
Exposure visits	22	329	67	396
Group discussion	21	276	55	331
Diagnostic visits	21	68	22	90
Method demonstrations	16	221	105	326
Awareness	13	248	72	320
Field day	12	652	147	799
Meetings	9	88	-	88
Mass campaign	5	70	20	90
Animal health camp	1	32	8	40
World milk day celebration	1	22	16	38
Grand Total	320	2481	628	3109

Chapter 4

HUMAN RESOURCE DEVELOPMENT

KVK system is one among the larger wings of National Agricultural Research System in India, with more than 10000 staff. About 1280 (12.8 percent) of them are serving in Zone VIII. Among this 62.5 per cent are scientific / technical staff, who need constant up-gradation of their knowledge and skills with respect to the latest technological developments in agriculture and allied sectors. In this direction, this Directorate has taken many capacity building programmes for the benefit of KVK staff and the details are presented here under.

Zonal Project Directorate has organized one orientation training course on Technology Assessment, Refinement and Demonstration and trained 24 newly recruited KVK staff of Zone VIII at KVK Tuticorin from 8th January 2013 to 11th January 2013. In addition to the normal course content, the training programme also included sharing of experiences on KVK system and its mandate from various resource persons including Zonal Project Director Zone VIII Bangalore, Programme Coordinators and Subject Matter Specialists of award winning KVKs and officials from Development Departments. All the basic principles about the KVK system were imparted to the newly recruited KVK staff. The training programme was well appreciated by the participants and the feedback from the participants was highly positive and encouraging.

In addition, a two day's training programme on Administrative and Accounting Procedures for KVKs was conducted at KVK Coimbatore during 07-08th January 2013 in which 21 administrative staff from KVKs of Zone VIII have participated. The participants were imparted knowledge and skills about various administrative and accounting procedures which are essential for smooth functioning of the KVKs. This programme was also well appreciated by the participants.

Further, Zonal Project Directorate-Zone VIII had also organized one training programme on "Participatory Impact Monitoring and Assessment (PIMA) at KVK

Erode from 28th January 2013 to 2nd February 2013. The programme included theory sessions, field visits, guest lectures and the major principles and concepts in PIMA were dealt in detail and the participants gave an excellent feedback about the course content and the way of conducting the programme.

KVK staffs have also participated in HRD activities conducted by other institutions through their respective host organizations. During the year, KVK staff attended different training courses of different duration viz., short, medium and long duration as a part of HRD programme organized by NARS in the country on the thematic areas viz., hi-tech horticulture, information and communication technology, e-Extension, agricultural marketing, agricultural statistics, Integrated Crop Management, Integrated Pest Management, Integrated Disease Management, seed technology, bio-diversity, patenting procedures, entrepreneurship development programme, farm machineries, processing and value addition, process documentation, Integrated Farming Systems, production and management of livestock and fisheries, disease management of livestock and fisheries etc.

A total of 569 KVK staff consisting of 60 Programme Coordinators, 491 Subject Matter Specialists, 10 Programme Assistants and 8 Administrative Staff underwent HRD programmes during the year 2012-13 on various aspects of agriculture and allied sectors and also administrative and accounting procedures organized by various organizations in the country.



A view of PRA during the training course



A view of HRD programmes organized by Zonal Project Directorate-Zone VIII, Bangalore

Chapter 5

PUBLICATIONS

Staff of Zonal Project Directorate have involved in documentation of various activities. Publications brought out are listed below.

5.1 Research Articles

Subramanian P, Dhanapal R, Mathew A C, Palaniswami C, Upadyaya AK, Naresh Kumar S and Srinivasa Reddy D V . 2012. Effect of fertilizer application through micro-irrigation technique on nutrient availability and coconut productivity. *Journal of Plantation Crops*, 40(3):168-173.

Maheswarappa H.P, Krishnakumar V, Srinivasa Reddy D.V, Dhanapal R, and John Zachariah T, 2012. Performance of different varieties/hybrids of black pepper (*Piper nigrum* L.), as mixed crop in coconut garden. *Journal of Plantation Crops*, 40(2): 82-85

5.2 Papers Presented in International/National Conferences

Prabhu Kumar S and Sairam C V. 2012. Technology Integration Through Institutional Approach. *Souvenir of 7th National Conference of KVK -2012* held at PAU Ludhiana during 20-22 November, 2012. pp.16-18.

Prasad M V, Sairam C V, Arulraj S and Jameema J. 2012. Estimation of cost of production of oil palm in Andhra Pradesh. Paper presented in *XX PLACROSYM* organized by UPASI Valparai held at Coimbatore during 12-15 December, 2012.

Ramamoorthy G, Suguna M, Kumaravadivelu P and Sairam C V. 2012. Intercropping in tea with medicinal plant in the Nilgiris. Paper presented in *XX PLACROSYM* organized by UPASI Valparai held at Coimbatore during 12-15 December, 2012.

Moolchand Singh, Sairam C V and Prabhu Kumar S. 2012. Evaluation of Integrated Weed Management Practices in rainfed cotton. Paper presented in *Silver Jubilee International Symposium on Global cotton production technologies viz-a-viz climate change* held

at CCS Haryana Agricultural University Hisar during 10-12 October, 2012. pp.274-276.

Prabhu Kumar S and Rayudu B T. 2012. KVK-A Transformational Institution. Lead paper presented in *National Workshop on Recent Trends in Impact Assessment* held at KVK, Kurda during 12-13 December, 2012.

Chandre Gowda, M.J. 2013. Innovations in Extension Delivery in India. Lead paper in the Compendium of the National Seminar on Futuristic Agricultural Extension for Livelihood Improvement and Sustainable Development held at ANGRAU, Hyderabad during 19-21 January, 2013. pp. 1-28.

Chandre Gowda, M.J. 2013. Technology Applications and use of ICTs. Theme paper presented at the National Workshop on Foresight and Future Pathways of Agricultural Research through Youth in India held at National Agricultural Science Centre (NASC), New Delhi during 1-2 March, 2013.

5.3 Technical bulletins/Books

Chandre Gowda M J. 2012 (ed). *Participatory Monitoring and Evaluation: Concept Publishing Co., New Delhi.* pp:153.

Technical bulletin on Expert System on Agriculture and Animal Husbandry Enterprises. Zonal Project Directorate, Zone VIII Bangalore

5.4 Reports

Annual Report 2011-12, Zonal Project Directorate-Zone VIII, Bangalore, India. (eds) Chandre Gowda M J, Sairam C V, Reddy D V S, Rayudu B T, Ramamurthy R S, Mallikarjun B.Hanji and Mathew J. Published by S.Prabhu Kumar, Zonal Project Director, ZPD-Zone VIII, Hebbal, Bangalore. pp 108.

Handbook on Agricultural Schemes implemented in Karnataka in Kannada, Handbook on Agricultural Schemes implemented in Tamil Nadu in Tamil and



Handbook on Agricultural Schemes implemented in Kerala in Malayalam, Zonal Project Directorate, Zone VIII Bangalore

5.5 Book Chapters/articles in Books

Chandre Gowda M.J. and Adapur S.H. 2012..Participatory Evaluation and Impact Assessment: A case study. In: M.J.Chandre Gowda, 2012 (ed). Participatory Monitoring and Evaluation: Concept Publishing Co., New Delhi. pp 76-86.

Vidya R. and Chandre Gowda M J. 2012. Participatory Impact Monitoring and Assessment. In: M.J.Chandre Gowda, 2012 (ed). Participatory Monitoring and Evaluation: Concept Publishing Co., New Delhi. pp 87-98.

Varadaraju G.M. and Chandre Gowda M J. 2012.

Theory-based Evaluation and the Application of Grounded Theory in the Extension Context. In: M.J.Chandre Gowda, 2012 (ed). Participatory Monitoring and Evaluation: Concept Publishing Co., New Delhi. pp 140-147.

Sairam C V. 2013. Is the present credit facility squeezing the life out of small farmers? In: The Hindu Survey of Agriculture 2012, pp.100-101

5.6 Publications by KVKs

KVK staff have documented and published 89 research papers, 58 technical reports, 171 newsletters, 30 books, 426 extension literatures, 487 popular articles, 116 technical bulletins and 148 CD/DVD on various technological aspects of agriculture and its allied enterprises.

Chapter 6

WORKSHOP, MEETINGS, CONFERENCES

6.1 Organization of Meetings/Workshops

The Zonal Project Director/Scientists/Officials of Zonal Project Directorate-Zone VIII have actively involved in organization/participation in various workshops, meetings and conferences organized in Zone VIII as well as ICAR which are listed here under:

- High Powered Committee Meeting held at Committee Room –II, NAAS Complex, New Delhi on 17 May, 2012.
- Zonal Annual Review Workshop of KVKs in Zone VIII at MVC, TANUVAS, Chennai during 7-10 June, 2012.
- Sub Committee Meeting of HPC on Administration, Financial Procedures, Monitoring & Evaluation for KVK System held at Committee Room –II, NAAS Complex New Delhi on 26 June 2012.
- Sub Committee of HPC on Road map for KVK System held at NAAS, New Delhi on 27 June, 2012.
- Sub-Committee meeting of HPC on Technical Programme of KVK System held at Jaipur on 08 July 2012.
- High Powered Committee meeting held at Conference Hall, Agricultural Extension Division, ICAR, New Delhi during 23-24 July, 2012.
- Discussion Meeting on draft report of High Powered Committee (HPC) and Draft Guidelines on Management of KVK System held at Board Room, NASC, New Delhi during 09-11 January, 2013.
- Discussion meeting on Expert Systems Project held at Zonal Project Directorate Zone VIII Bangalore on 24 January, 2013.
- Inauguration of first floor of the administrative building of Zonal Project Directorate -Zone VIII, Bangalore on 25 January, 2013.
- Launching workshop of Expert Systems for Agriculture and Animal Husbandry Enterprises held at Zonal Project Directorate -Zone VIII, Bangalore on 25 January, 2013.
- KVK -Industry Interface workshop at Zonal

Project Directorate Zone VIII Bangalore on 25 January, 2013.

- Discussion Meeting on Draft Report of High Powered Committee (HPC) and Draft Guidelines on Management of KVK System held at Division of Agricultural Extension, ICAR, New Delhi during 13-14 February, 2013.
- Zonal Action Plan Workshop of KVKs in Zone VIII at UAS Dharwad during March 25-27, 2013.

6.2 Participation in Meetings/Workshops/Conferences/Seminars

The Zonal Project Director/Scientists/Officials of this Directorate have participated in the following meetings/workshops/conferences/seminars held during the reporting period:

- Scientific Advisory Committee meetings and Technology Weeks organized by KVKs in Zone VIII.
- Review meeting of NICRA held at Namakkal on 2 April, 2012.
- Selection Committee meeting held at KVK, Coimbatore on 3 April, 2012.
- Review meeting of Expert System held at TNAU, Coimbatore on 4 April, 2012.
- Discussion-cum-preparation meeting of XII Plan EFC proposals of the KVK Scheme of Extension Division of ICAR held at Agricultural Extension Division, ICAR, New Delhi during 12-14 April, 2012.
- Discussion meeting on finalization of BE proposals of KVKs held at Agricultural Extension Division, ICAR, New Delhi during 12-14 April, 2012.
- Review of KVK, Belgaum-II held on 20 April, 2012
- Discussion-cum-preparation meeting of XII Plan EFC proposals of the KVK Scheme of Extension Division of ICAR held at Agricultural Extension Division, ICAR, New Delhi during 7-10 May, 2012.
- Action Plan meeting of KVKs under NICRA held at KVK, Namakkal during 14-15 May, 2012.



- Orientation and review of KVK, Coimbatore held on 23 May, 2012.
- Governing Body meeting of KVK, Puducherry held on 24 May, 2012.
- National workshop and brain storming on redefining FLDs; Maximising impacts held at DRR, Hyderabad on 28 May, 2012.
- Selection of Consultants to ACABC Scheme held at MANAGE, Hyderabad on 12 June, 2012.
- Regional Committee Meeting of Region VIII held at SBI, Coimbatore during 14-18 June, 2012.
- Meeting with Vana Vigyan Kendra, Coimbatore held on 18 June, 2012.
- Review of KVK, Kancheepuram held on 20 June, 2012.
- Board of Studies meeting held at Dindigul on 21 June, 2012.
- Selection Committee meeting of KVK, Mysore held on 22 June, 2012.
- Scientific Workers' Conference held at TNAU, Coimbatore during 28-29 June, 2012.
- ATMA Workshop at SAMETI held at UAS Dharwad during 30 June, 2012 to 1 July, 2012.
- Selection Committee Meeting for KVK Staff recruitment at KVK, Thiruvannamalai and Krishnagiri held at TNBRD, Chennai during 4-5 July, 2012.
- Promotion of Agro and Food Enterprise in Rural Areas held at National Institute for Micro, Small and Medium Enterprises, Hyderabad during 9-13 July, 2012.
- Review of KVK Thrissur held on 10 July, 2012.
- Review meeting at KVK Puducherry held on 17 July, 2012.
- Review Meeting of Expert System on Animal Science Enterprises held at TNAU, Coimbatore on 26 July, 2012.
- Meeting of Sri Ramakrishna Ashram at Kancheepuram District with the staff of KVK, Kancheepuram held on 2 August, 2012.
- Meeting at NICRA village of KVK Villupuram held on 4 August, 2012.
- Validation meeting of Expert System on Crop Enterprises with KVKs of Karnataka held at KVK Dharwad on 9 September, 2012.
- Meeting of Network Project on Development of Expert System held at UHS, Bagalkot on 12 September, 2012.
- Selection Committee meeting of KVK Coimbatore held on 16 September, 2012.
- Network Project on Development of Expert System held at TNAU, Coimbatore during 24-25 September, 2012.
- Discussion meeting on finalization of RE proposals of KVKs held at Agricultural Extension Division, ICAR, New Delhi during 24 -28 September, 2012.
- Selection of Nodal Training Institutes of ACABC Scheme, at MANAGE, Hyderabad on 4 October, 2012.
- Seventh National Conference on KVK-2012 held at PAU Ludhiana during 20-22 November, 2012.
- National fund project development workshop held at NAARM Hyderabad during 23-25 November, 2012.
- Seminar of Organic Farmers held at TNAU, Coimbatore on 29 November, 2012.
- Discussion-cum-preparation meeting of XII Plan EFC proposals of the KVK Scheme of Extension Division of ICAR held at Agricultural Extension Division, ICAR, New Delhi during 6-7 December, 2012.
- Selection Committee meeting at KVK-II, Belgaum held on 16 December, 2012.
- Scientific Advisory Committee meeting of NHRDF held at New Delhi on 17 December, 2012.
- Review of KVK, Belgaum I held on 17 December, 2012.
- Foundation stone laying ceremony for Community Radio Station held at KVK, Namakkal on 22 December, 2012.

- Discussion-cum-preparation meeting of XII Plan EFC proposals of the KVK Scheme of Extension Division of ICAR held at Agricultural Extension Division, ICAR, New Delhi during 3-4 January, 2013.
- Discussion meeting on finalization of revised RE proposals of KVKs held at Agricultural Extension Division, ICAR, New Delhi during 3 - 4 January, 2013.
- Orientation and interaction programme for Office Assistant of NGO KVKs held at KVK Coimbatore on 7 January, 2013.
- Orientation programme for newly recruited KVK staff held at KVK, Tuticorin on 8-11 January, 2013.
- Discussion-cum-preparation meeting of XII Plan EFC proposals of the KVK Scheme of Extension Division of ICAR held at Agricultural Extension Division, ICAR, New Delhi during 8-10 January, 2013.
- Workshop on PIMA held at KVK Erode on 28 January, 2013.
- Review meeting of KVKs of TNAU at Coimbatore on 29 January, 2013.
- Inspection of building of KVK Krishnagiri on 30 January, 2013.
- Discussion-cum-preparation meeting of XII Plan EFC proposals of the KVK Scheme of ICAR held at Agricultural Extension Division, ICAR, New Delhi during 30-31 January, 2013.
- Meeting on NICRA held at KVK, Namakkal on 7 February, 2013.
- Discussion meeting with authorities of host organizations of KVK, Karur regarding the new management held on 15 February, 2013.
- Pre-action plan meeting of KVKs of Kerala and Lakshadweep held at KAU, Thrissur on 15 February, 2013.
- Review meeting of KVKs Gulbarga I and II held during 16-18, February, 2013.
- Pre-action plan meeting of KVKs in Tamil Nadu held at TNAU, Coimbatore during 25-26 February, 2013.
- Pre-action plan meeting of KVKs in Southern Karnataka held at KVK, Chikballapur during 27-28 February, 2013.
- Discussion-cum-preparation meeting of XII Plan EFC proposals of the KVK Scheme of Extension Division of ICAR held at Agricultural Extension Division, ICAR, New Delhi during 27 February to 6 March 2013.
- Young Professionals Workshop held at NASC Complex, ICAR, New Delhi during 1- 2 March, 2013.
- Pre-action plan meeting of KVKs in Northern Karnataka held at KVK, Bijapur during 4 -5 March, 2013.
- Review of NICRA activities at KVKs Villupuram and Ramanathapuram during 12-13 March, 2013.



Chapter 7

PERSONNEL

Existing staff position of the Zonal Project Directorate-Zone VIII, Bangalore as on March 31, 2013 is presented below:

7.1 Staff in Position

Research Management Position	Dr.S.Prabhu Kumar	Zonal Project Director
Scientific	Dr.M.J.Chandre Gowda	Principal Scientist(Agricultural Extension)
	Dr.D.V.Srinivasa Reddy	Principal Scientist (Agronomy)
	Dr.C.V.Sairam	Principal Scientist (Agricultural Economics)
	Dr.B.T.Rayudu	Principal Scientist (Agricultural Extension)
Technical	Shri.R.S.Ramamurthy	Field Officer
	Dr.Mallikarjun B.Hanji	Computer Programmer
	Shri.M.N.Prasad	Driver
Administrative	Mrs. Sunanda C	Finance and Accounts Officer
	Shri.J.Mathew	Assistant Administrative Officer
	Shri. J.Prabu Kumar	Assistant
	Shri Thomson John	Assistant
	Mrs. Ramola Pinto	Junior Stenographer
	Shri. N.Vinod Kumar	LDC
	Ms. K. Roopakala	LDC
Supporting	Shri.Chennakeshava	SSS (Gr-II)

7.2 Joining/Superannuation/Promotion

- Shri Thomson John joined as Assistant on 02.07.2012
- Mrs.C.Sunanda promoted from Assistant Finance and Accounts Officer to Finance and Accounts Officer w.e.f. 26.12.2012.
- Dr.B.T.Rayudu promoted from Senior Scientist (Agricultural Extension) to Principal Scientist (Agricultural Extension) w.e.f. 01.01.2009 under revised CAS.





A view of Annual Review Workshop 2011-12



A view of Annual Action Plan Workshop 2013-14



Zonal Project Directorate - Zone VIII
Indian Council of Agricultural Research
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