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, State Agricultural Universities (SAUs), State Department of Agriculture and Non-Government Organizations (NGOs) with an aim to assess, refine and demonstrate technologies in agricultural and allied sectors. ICAR-Division of Agriculture Extension headed by the Deputy Director General (Agricultural Extension) monitors and reviews the progress of KVKs through its eight Zonal Project Directorates (ZPDs) located in different parts of the country. **(Table-1)**

Table 1: States/ UTs in the Jurisdiction of their respective Zonal Project Directorates

Zones	No. of States and UTs	States/ UTs
I	5	Delhi, Haryana, Himachal Pradesh, Jammu &Kashmir and Punjab
II	4	Andaman & Nicobar 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

1.1 Genesis

ICAR established 8 Zonal Coordinating Units (ZCUs) in September 1979 to monitor and coordinate its Lab to Land Programme, which was launched in 1979 on occasion of ICAR's Golden Jubilee celebrations. To begin with, Zonal Coordinating Unit-Zone-I had its office at Punjab Agricultural University (PAU), Ludhiana. The jurisdiction of Zone-1 includes the states of Punjab, Haryana, New Delhi, Himachal Pradesh and Jammu & Kashmir. The Unit was converted into a Plan Scheme in 1986 with additional staff and objective of monitoring/Transfer

of Technology projects of ICAR viz. KVKs, Trainers Training Centers, National Demonstration Scheme, Operational Research Project, Scheduled Caste & Schedule Tribe Project and Special Project on Oilseeds. During 1990-91, National Pulse Project was started.

The Zonal Coordinating Units were upgraded as Zonal Project Directorates 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 the Directors of other ICAR institutes.

1.2 Mandate

Mandate of the ICAR-Zonal Project Directorate is as follows:

- Formulate, implement, monitor and evaluate the programmes and activities of KVKs and Agricultural Technology Information Centers (ATICs).
- Coordinate the work relating to KVKs and ATICs implemented through various agencies such as SAUs, ICAR institutes, NGOs and developmental departments.
- Coordinate with State/Central Government organizations, financial institutions and any other organization for successful implementation of programmes.
- Serve as feedback mechanism to research and extension systems.
- Help in implementation of other projects on oilseeds, pulses, maize, cotton, improved implements, climate resilient 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

To realize the mandate of this Directorate, a total Staff strength of 18 has been sanctioned as per details given in **Table 2**. As on 31st March, 2015, out of sanctioned 18 posts, 9 were filled and 9 were vacant.

Table 2: Staff Position of ICAR ZPD, Zone-I, Ludhiana as on 31.03.2015

Name of the Post	Sanctioned	Filled	Vacant
RMP	1	1	0
Principal Scientist	1	0	1
Senior Scientist	3	1	2

Scientist	2	1	1
Assistant Administrative Officer	1	0	1
Assistant Finance & Accounts Officer	1	1	0
Assistant	2	2	0
Personal Assistant	1	0	1
Upper Division Clerk	1	0	1
Lower Division Clerk	2	2	0
Skilled Support Staff	2	0	2
Technical (T-1)	1	1	0
Total	**18**	**9**	**9**

1.4 Organizational Structure

The Organizational structure of ICAR-Zonal Project Directorate and KVKs functioning in the jurisdiction of this Directorate is depicted in fig 1.

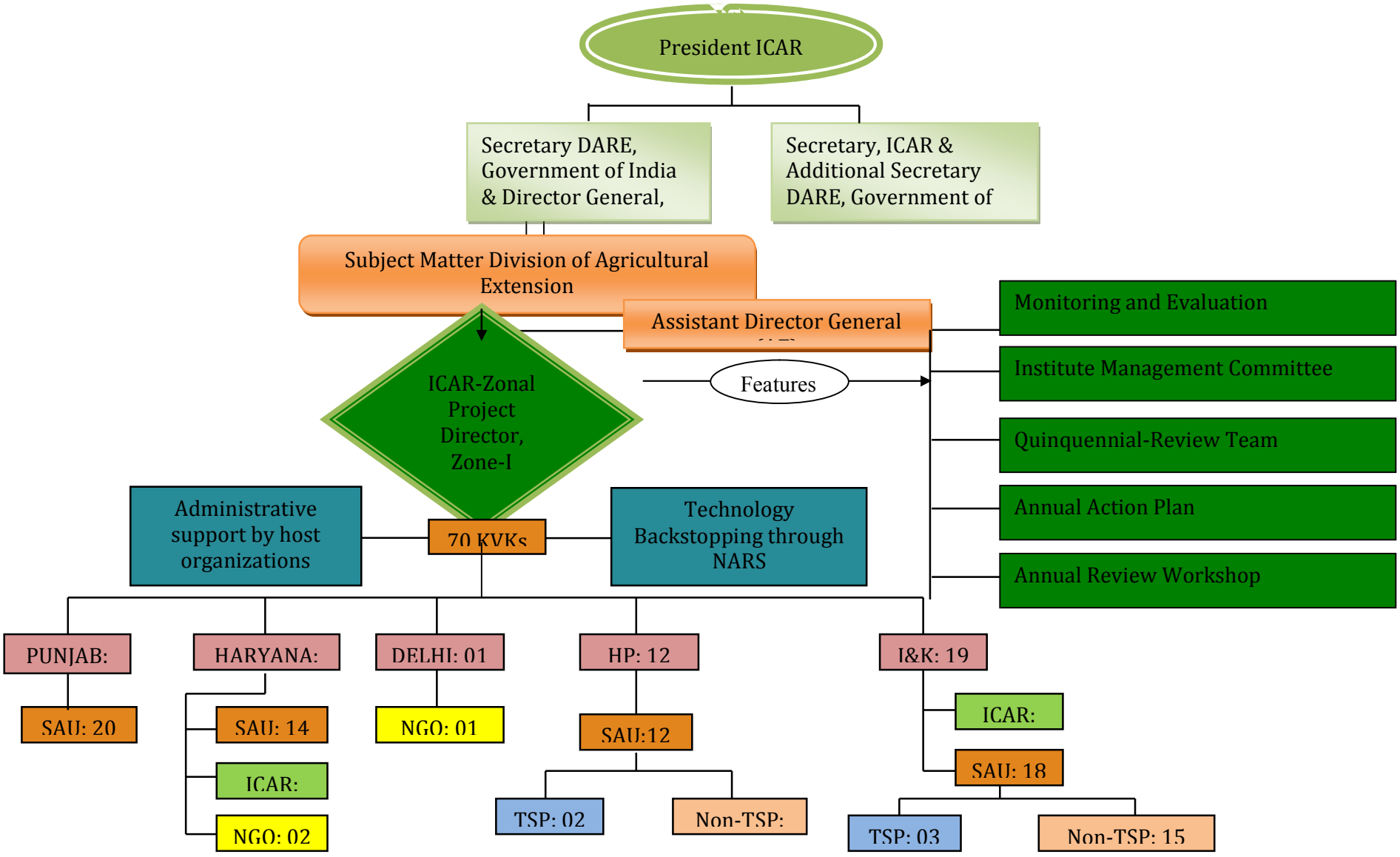
President ICAR
Secretary DARE, Government of India & Director General,
Secretary, ICAR & Additional Secretary DARE, Government of
Subject Matter Division of Agricultural Extension
Assistant Director General
ICAR-Zonal Project Director, Zone-I
Features
Monitoring and Evaluation
Institute Management Committee
Quinquennial-Review Team
Annual Action Plan
Annual Review Workshop
Administrative support by host organizations
70 KVKs
Technology Backstopping through NARS
PUNJAB:
SAU: 20
HARYANA:
SAU: 14
ICAR:
NGO: 02
DELHI: 01
NGO: 01
HP: 12
SAU:12
TSP: 02
Non-TSP:
I&K: 19
ICAR:
SAU: 18
TSP: 03
Non-TSP: 15

Fig. 1: Organizational Structure of Zonal Project Directorate

1.5 Budget

A total of Rs. 6239.84 was sanctioned for the year of 2014-15 and 100 percent of the sanction budget was utilized by KVKs and DEEs of the Zone. Head wise details of the sanctioned budget given below:

Table 3: Head wise Budget for the year 2014-15 (Rs. in lakhs)

Sl. No.	Name of the Scheme	Head of Account	Sanction Budget RE 2014-15	Expenditure/Release 2014-15
	ZPD(A)			
1		Grants for creation of Capital Assets	0.00	0.00
2		Grants in Aid Salaries	120.00	106.84
3		Grant in Aid General	44.00	39.05
Total (A)			**164.00**	**145.89**
	KVKs(B)			
1		Grants for creation of Capital Assets	215.34	215.34
2		Grants in Aid Salaries	5449.00	5449.00
3		Grant in Aid General	397.50	397.50
Total (B)			**6061.84**	**6061.84**
	DEEs(C)			
1		Grants for creation of Capital Assets	0.00	0.00
2		Grants in Aid Salaries	0.00	0.00
3		Grant in Aid General	14.00	14.00
Total (C)			**14.00**	**14.00**
Total (A+B+C)		**Grants for creation of Capital Assets**	**215.34**	**215.34**
		Grants in Aid Salaries	**5569.00**	**5555.84**
		Grant in Aid General	**455.50**	**450.55**
GRAND TOTAL			**6239.84**	**6221.73**

Chapter- 2

ABOUT KRISHI VIGYAN KENDRAS

To address issues related to technology dissemination in agriculture, the Krishi Vigyan Kendra (KVK), also known as Agriculture Science Centre, a grass root level scheme has been designed and nurtured by ICAR for the past four decades. So far, ICAR has established 638 KVKs across the country under different host organizations like SAUs, ICAR Institutes, Central institutes/Deemed Universities, State Government, Public Sector Undertakings and NGOs.

The KVKs have played a crucial role in empowering the farmers since 1974 when the first KVK was established and proved their worth in addressing the needs of the stakeholders in the following way:

- Showcasing the frontier technologies
- Capacity development of stakeholders
- Front runner in technology application
- Making available technological information and inputs
- Practising participatory approaches in planning, implementing, executing and evaluation
- Pursuing assessment and refinement of technologies to suit different agro-climatic conditions

2.1 Establishment of KVKs

"All great things begin with a vision…a dream"

-Estee Lauder

The Education Commission, Govt. of India 1964-66, under the chairmanship of Dr. D.S. Kothari, recommended 'application of science to productive processes, including agriculture' and 'vocationalization of secondary and agricultural education.' These recommendations were subsequently reviewed by the Planning Commission of India and Inter-Ministerial Committee and further recommended by a Committee set up by ICAR under the Chairmanship of Dr. Mohan Singh Mehta (1973), found the ground of reality in 1974

with the establishment of India's first Krishi Vigyan Kendra (Agriculture Science Centre) in Puducherry under the aegis of the ICAR, New Delhi through its Division of Agricultural Extension. This zone got its first KVK in the district of Karnal in 1976. Till 31st March, 2015, a total of 70 KVKs existed in the zone. The details regarding the establishment of KVKs in the zone are given in Annexure I and the state wise details are given in Table 4.

2.2 Mandate

The ICAR Standing Committee on Agricultural Education headed by Dr. Mohan Singh Mehta observed that the KVKs are of national importance and are expected to look after the empowerment of the farming community through trainings and as such improving their socio-economic conditions. Taking into account the essence behind the establishment of KVKs, its mandate is assessment, refinement and demonstration of technologies/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 the following activities.

1. Conducting on-farm testing to identify the location specificity of agricultural technologies under various farming systems.
2. Organizing frontline demonstrations to establish production potential of various crops and enterprises on the farmers' fields.
3. Organizing need based training of 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.
4. Creating awareness about improved technologies to larger masses through appropriate extension programmes.
5. Production and supply of good quality seeds and planting materials, livestock, poultry and fisheries breeds and products and various bio-products to the farming community.
6. Work as resource and knowledge centre of agricultural technology for supporting initiatives of public, private and voluntary sector for improving the agricultural economy of the district.

2.3 Manpower

'Great vision without great people is irrelevant'

-Jim Collins

In order to realize the vision and objectives of KVK system, human resource is essential. Accordingly, staff strength of 16 is sanctioned for the KVKs, which include one Programme Coordinator, six Subject Matter Specialists, three Programme Assistants, two Administrative staff, two Drivers and two Supporting Staff. For the 70 KVKs in the zone, the total sanctioned strength is 1120, out of which, 923 are in position as on 31st March, 2015. The category wise staff of each KVK is detailed in Annexure II and state wise details are given in Table 3 A.

Table 3A: State wise and category wise details of staff position in KVKs

Staff Category		Punjab	Haryana	Himachal Pradesh	Jammu & Kashmir	Zone Total
Programme Coordinator	**S**	20	19	12	19	**70**
	F	18	19	10	17	**64**
	V	2	0	2	2	**6**
Subject Matter Specialist	**S**	120	114	72	114	**420**
	F	104	79	59	97	**339**
	V	16	35	13	17	**81**
Programme Assistant	**S**	60	57	36	57	**210**
	F	53	40	35	49	**177**
	V	7	17	1	8	**33**
Administrative staff	**S**	40	38	24	38	**140**
	F	33	33	23	23	**112**
	V	7	5	1	15	**28**
Driver	**S**	40	38	24	38	**140**
	F	34	33	24	26	**117**
	V	6	5	0	12	**23**
Supporting Staff	**S**	40	38	24	38	**140**
	F	36	28	22	28	**114**
	V	4	10	2	10	**26**
TOTAL	**S**	**320**	**304**	**192**	**304**	**1120**
	F	**278**	**232**	**173**	**240**	**923**
	V	**42**	**72**	**19**	**64**	**197**

Insert Table

2.4 Infrastructure Facilities

To accomplish the mandate of KVKs, they require some basic infrastructural facilities. ICAR has been keen to provide these infrastructural facilities to the KVKs. In the zone, 57 KVKs own their Administrative Building, 44 KVKs have Farmer's hostel, 38 KVKs have staff quarters, 18 KVKs have been provided with the rain water harvesting unit, 50

KVKs have soil and water testing labs, 28 KVKs are having the services of e-connectivity, 54 KVKs of the zone have demonstration units. As on 31st March, 2015, 67 KVKs have Jeeps, 61KVKs have two-wheelers and 58 have tractors. The details of the infrastructural facilities available in the KVKs have been provided in **Table 4.**

Table 4: State wise summary of infrastructure in KVKs

Infrastructure	**Punjab (20)**	**Haryana (18)**	**Delhi (1)**	**HP (12)**	**J&K (19)**	**Total (70)**
Administrative Building	16	18	1	10	12	57
Farmers Hostel	10	14	0	12	8	44
Staff Quarters	12	12	0	7	7	38
Demo Units	16	14	0	12	12	54
Soil & Water testing lab	15	15	0	11	9	50
Rain Water harvesting unit	5	5	0	6	2	18
E-connectivity lab	9	9	0	7	3	28
Jeep	20	18	1	12	16	67
Tractor	20	18	1	8	11	58
Two-Wheeler	17	18	1	12	13	61
Basic PH Diagnosis facilities	10	9	1	8	4	32
Min. agro Processing facilities	1	1	0	0	1	3
IFS	5	2	1	5	1	14
Mobile Dignosis cum Exhb. Unit	1	1	0	1	1	4
Total	**157**	**154**	**6**	**111**	**100**	**528**

Bee Keeping Unit

Vermi-Compost Unit

Piggery Unit

Dairy Unit

2.5 Scientific Advisory Committee

As per the guidelines issued by the Council, all KVKs have constituted their Scientific Advisory Committees (SAC) under the Chairmanship of the Head of the host organization. KVKs have to conduct SAC meetings twice a year to get technical and scientific guidance in achieving their targets more effectively and efficiently. The details of SAC meetings conducted by KVKs during the year have been compiled and furnished in Table 7. A total of 15 KVKs have conducted stipulated 2 meetings and 46 KVKs have conducted one meeting.

SAC Meeting at KVK Lahual & spiti on 27th June, 2014

SAC Meeting at KVK Srinagar on 12th February, 2015

2.6 Revolving Fund

Revolving fund is in operation at 69 KVKs of the Zone-I. The KVKs are utilizing revolving fund for production of technological products and the net balance as on March 31st, 2015 was Rs. 22.67 crore. During the reporting period the net balance of more than Rs. 100 lakh was there in 6 KVKs followed by Rs. 75 to 100 lakh was there in 5 KVKs, Rs. 50 to 75 lakh in 6 KVKs, Rs. 25 to 50 lakh in 8 KVKs, Rs. 10 to 25 lakh in 17 KVKs, Rs. 5 to 10 lakh in 6 KVKs Rs. 1 to 5 lakh in19 KVKs and less than Rs. 1 lakh in 2 KVKs.

Net balance of Rs. 22.67 crore was available as on 31st March, 2015 under revolving fund and 17 KVKs have a net balance of more than Rs. 50 lakh.

Net balance of Rs. 22.67 crore was available as on 31st March, 2015 under revolving fund and 17 KVKs have a net balance of more than Rs. 50 lakh.

2.7 Thrust Areas

As per agro-ecological conditions, cropping pattern and farming systems of districts, the KVKs decide the thrust areas and work accordingly. For the KVKs of this zone, the major thrust areas can be grouped in two categories i.e. those of Plain States and Hill States.

Plain States (Punjab, Haryana and Delhi)

- Soil & water conservation and improvement of soil health
- Crop diversification
- Hybrid seed production
- Integrated Nutrient/Pest/Weed Management in different crops
- Popularization of resource conservation technologies
- Improvement in the productivity of livestock
- Management of repeat breeding in dairy animals
- Clean milk production and processing of dairy products
- Drudgery reduction of farmwomen
- Value addition in agricultural products

- Supplementary source of income for farmwomen
- Self employment for rural youth
- Use of information and communication technologies

Hill States (Himachal Pradesh and Jammu & Kashmir)

- Water conservation and management
- Promotion of exotic and off-season temperate vegetable cultivation
- Protected cultivation of low volume and high value crops
- Rejuvenation of old orchards
- Integrated Nutrient/ Pest/ Weed Management
- Promoting vermi-compost and organic farming
- Promoting cultivation of medicinal and aromatic plants
- Improvement in the productivity of livestock
- Drudgery reduction of farmwomen

Chapter 3

ACHIEVEMENTS

3.1 KRISHI VIGYAN KENDRAS

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

3.1.1 Technology Assessment and Refinement

A productive research and extension is crucial for the improvement of agricultural sector and the farmer's participation in the development process is prerequisite to solve field problems and ultimately increase the impact of agricultural research. On farm testing (OFT) of technologies is mainly focused to test already developed technologies in terms of location specific sustainable land use systems and helpful to solve the most important and widely spread problems of farmers in a defined area within their farming systems perspective with their active participation and management. Therefore, the objective of OFT is to test and evaluate the research findings of Research Stations at the farmer's field and to refine and modify the technologies since many farm technologies developed so far does not fit well to all areas. Participatory Rural Appraisal (PRA) is conducted to identify the problems faced by the farmers and based on the priority of the problems, OFT is formulated. During the period under report, KVKs of Zone I assessed 526 technologies (470 related to crops, 36 related to animal husbandry and 20 related to enterprises) at 2681 locations. Furthermore, the KVKs refined 58 technologies, including 48 related to crops and 10 related to animal husbandry at 482 locations (Fig. 2)

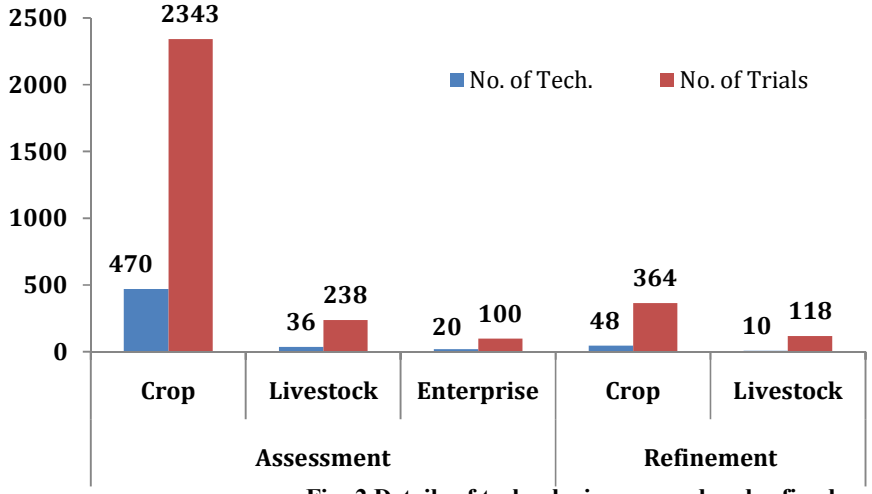

Fig: 2 Details of technologies assessed and refined

3.1.1.1Technology Assessment: Out of 470 technologies of 96 crops assessed, maximum number of technologies were assessed under thematic area Varietal Evaluation (124), followed by Integrated Nutrient Management (71), Integrated Disease Management (58), Integrated Weed Management (47), Integrated Crop Management (44) and Integrated Pest Management (31). As far as other thematic areas namely, Resource Conservation Technology, Drudgery Reduction, Farm Machinery, Value Addition and Integrated Farming Systems are concerned, 27, 15, 10, 30 and 13 technologies, respectively of these thematic areas were assessed (**Table 5**).

Table 5: Thematic area wise number of technologies of different crops assessed

Thematic areas	**No. Crops/ Enterprises**	**No. of OFT**	**No. of trials**	**No. of KVKs**
Integrated Crop Management	35	44	144	29
Integrated Disease Management	33	58	227	30
Integrated Nutrient Management	45	71	346	36
Integrated Pest Management	21	31	138	19
Integrated Weed Management	21	47	159	26
Varietal Evaluation	65	124	667	39
Resource Conservation Technology	15	27	168	19
Drudgery Reduction	13	15	231	13
Farm Machinery	6	10	33	6
Value Addition	20	30	192	24
Integrated farming system	8	13	38	6
Total	**-**	**470**	**2343**	**-**

The figures depicted in **table 6** indicate that maximum number of crop related technologies (161) were assessed by KVKs of Punjab at 694 locations, followed by KVKs of Haryana (136 technologies at 853 locations). KVKs of Himachal Pradesh and Jammu & Kashmir assessed 78 and 87 technologies at 388 and 384 locations, respectively. The sole KVK of Delhi assessed 8 technologies at 24 locations.

Table 6: State wise number of technologies of different crops assessed

State	**No. of Crops**	**No. of tech.**	**No. of trials**	**No. of KVKs**
Punjab	41	161	694	18

State	No. of Crops	No. of tech.	No. of trials	No. of KVKs
Haryana	40	136	853	17
Delhi	8	8	24	1
Himachal Pradesh	29	78	388	12
Jammu & Kashmir	44	87	384	15
Total (Zone-1)	**-**	**470**	**2343**	**-**

In case of animal husbandry, KVKs assessed 36 technologies on different thematic areas at 238 locations. Maximum of 15 technologies each were assessed under disease management and nutrition management, followed by 3 of production & management. Under thematic area feed & fodder management and breed evaluation, 1 and 2 technologies were assessed, respectively (**Table 7**).

Table 7: Thematic area wise number of technologies of animal husbandry assessed

Thematic areas	Animals	No. of OFT	No. of trials	No. of KVKs
Breed Evaluation	1	2	10	2
Disease management	4	15	84	13
Nutrition Management	5	15	57	15
Production & Management	2	3	7	3
Feed and fodder management	2	1	80	2
Total (Zone-1)	**-**	**36**	**238**	**-**

State wise details of technologies assessed under animal husbandry are given in **table 8** KVKs of Punjab assessed 17 technologies at 56 locations and KVKs of Jammu & Kashmir assessed 11 technologies at 72 locations while 3 technologies each were assessed by KVKs of Haryana and Himachal Pradesh at 86 and 18 locations, respectively. KVK of Delhi assessed 2 technologies at 6 locations.

Table 8: State wise number of technologies of animal husbandry assessed

State	No. of animals	No. of tech.	No. of trials	No. of KVKs
Punjab	2	17	56	7
Haryana	1	3	86	2
Delhi	2	2	6	1
Himachal Pradesh	2	3	18	4

State	No. of animals	No. of tech.	No. of trials	No. of KVKs
Jammu & Kashmir	5	11	72	7
Total (Zone-1)	**-**	**36**	**238**	**-**

On farm Trial on management of fusarium wilt

On farm trial on Direct Seeded Rice

As depicted in **table 9**, total of 20 technologies related to various enterprises were assessed at 100 locations by 13 KVKs of Punjab, Haryana and Jammu & Kashmir. State wise, 3 KVKs of Haryana assessed 8 technologies of 3 enterprises at 64 locations while 4 KVKs of Punjab assessed 3 technologies of 2 enterprises at 9 locations.

Table 9: Details of technologies of different enterprises assessed

Thematic areas	No. Crops/ Enterprises	No. of OFT	No. of trials	No. of KVKs
Punjab				
Surf making	1	2	8	3
Seed production	1	1	1	1
Total (Punjab)	**2**	**3**	**9**	**4**
Haryana				
Mushroom Cultivation	1	3	5	2
Agro-forestry	1	4	49	1
(VA)Paper Patterns	1	1	10	1
Total (Haryana)	**3**	**8**	**64**	**3**
Jammu & Kashmir				

Thematic areas	No. Crops/ Enterprises	No. of OFT	No. of trials	No. of KVKs
Seed and plant production	1	9	27	6
Total (Jammu & Kashmir)	**1**	**9**	**27**	**6**
Total (Zone-1)	**5**	**20**	**100**	**-**

3.1.1.2 Technology Refinement: Out of 48 technologies of 35 crops refined, maximum number of technologies were refined under thematic area Integrated Disease Management (10), followed by Integrated Crop Management and Integrated Pest Management (8 each), and Value Addition (7). As far as other thematic areas namely, Integrated Nutrient Management, Integrated Weed Management, Resource Conservation Technology and Drudgery Reduction are concerned, 6, 5, 3 and 1 technologies, respectively of these thematic areas were refined (**Table 10**). State wise details of technologies refined are given in **table 11**.

Table 10: Thematic area wise number of technologies of different crops refined

Thematic areas	No. Crops/ Enterprises	No. of OFT	No. of trials	No. of KVKs
Integrated Crop Management	8	8	27	7
Integrated Disease Management	8	10	127	8
Integrated Nutrient Management	5	6	21	5
Integrated Pest Management	8	8	30	6
Integrated Weed Management	5	5	38	4
Resource Conservation Technology	2	3	13	1
Drudgery Reduction	1	1	40	1
Value Addition	6	7	68	5
Total	**-**	**48**	**364**	

Table 11: State wise details of technologies of different crops refined

State	No. of Crops	No. of tech.	No. of trials	No. of KVKs
Punjab	18	15	135	7
Haryana	10	12	153	6

State	No. of Crops	No. of tech.	No. of trials	No. of KVKs
Himachal Pradesh	10	10	49	8
Jammu & Kashmir	7	11	27	4
Total (Zone-1)	**-**	**48**	**364**	**25**

In case of animal husbandry, KVKs refined 10 technologies on different thematic areas at 118 locations. Six technologies under Nutrition management, 2 technologies under feed & fodder management and one technology each under disease management and production & management were taken **(Table 12).** State wise details of technologies refined under animal husbandry are given in **table 13**.

Table 12: Thematic area wise number of technologies of animal husbandry refined

Thematic areas	No. of type of animal	No. of OFT	No. of trials	No. of KVKs
Disease Management	3	1	3	1
Feed and Fodder Management	2	2	83	2
Nutrition Management	4	6	29	6
Production & Management	1	1	3	1
Total (Zone-1)	**-**	**10**	**118**	**--**

Table 13: State wise number of technologies of animal husbandry refined

Thematic areas	No. of type of animal	No. of tech.	No. of trials	No. of KVKs
Punjab	1	5	26	4
Haryana	2	4	89	3
Jammu & Kashmir	1	1	3	1
Total (Zone-1)	**4**	**10**	**118**	**8**

Location specific technologies

(A) Integrated Pest Management

Management of woolly apple aphid through insecticide application rescheduling:

Apple is the main horticultural crop in dry temperate ecosystem of Kinnaur district of Himachal Pradesh. Wooly aphid is the major pest that causes huge losses in the apple orchards. The existing practice was found less effective in management of the aphid infestation. KVK Kinnaur conducted On Farm Testing for the effective management of this

pest in the region. The less incidence of terminal shoot infestation (1.85 %) with highest yield (109.5 q/ha) and BC ratio (3.97) was observed in the technological option namely drenching with Chlorpyriphos @ 4ml/L (5L solution/plant) at petal fall stage.

Integrated management of sucking pests of capsicum under protected cultivation:

Capsicum is generally grown by the farmers under protected conditions in Kullu district of Himachal Pradesh. Sucking pests such as aphids, mite and white fly causes huge economic losses to the growers. Generally farmers apply 5-6 sprays of cypermethrin for the control of these pests. However, repeated spray of one insecticide cause resistance among these pests. Hence, KVK Kullu planned and executed On Farm Testing for the integrated management of these pests under protected conditions. It was found that less incidence of sucking pests (Aphids 6.25%; white fly 5.78%; mite 2.95%) and higher yield(2.94t/250 m^2) was observed with the application of Neem cake @ 30 g/ m^2 + installation of yellow sticky traps @ 1 trap/ 20 m^2 + Fenzaquin @ 0.25 ml/ L and Azadirachtin @ 0.03 % alternate sprays at 15 days interval.

Integrated management of stem borer & leaf folder in hybrid paddy (Cv. Arize 6129):

Hybrid paddy cultivation is gaining momentum in lower and mid hill areas of district Mandi. However, these hybrids are more susceptible to various diseases and insect pests. Among the pests, stem borer and leaf folder are the major pests causing yield loss up to 15-30% in the region. Existing recommendations are also not so effective for the management of these pests. Hence, KVK Mandi conducted On Farm Testing on integrated management of these pests. Soil incorporation of carbofuran @ 33kg /ha+ release of *Trichoderma japonicum* @ 5cc/ha+ Azadirachtin @ 0.03 % at initiation of pest incidence resulted in minimum incidence of pests (Dead heart / white ears/ hill 1.69% and Leaf folder incidence 2.08%) and provided the highest yield (60.50q/ha).

Integrated management of fruit flies:

Fruit flies cause huge economic losses especially in cucurbits. Due to peculiar damaging potential, hidden or concealed maggots emerged out of the eggs laid by females inside fruit or plant parts mostly escape the insecticides applied for its management. Also the heavy loads of insecticides applied for their management pollutes our environment apart from many side effects. The effective management of the pest could only be possible through mass trapping of the male fruit flies (male annihilation technique- MAT) followed by need based insecticidal application. KVK Jhajjar and KVK Rohtak conducted On Farm Testing on

management of fruit fly in bottle gourd and cucumber, respectively. It was found that Pheromone trap @ 25 traps/ha and 1 spray of Malathion @ 1.25l/ha resulted in the less fruit fly attack and gave higher yield than the recommended and farmers' practice. In Jhajjar district, the yield obtained in the above mentioned technological option was 29.5 t/ha whereas, it was 4.95 t/ha in Rohtak district. Guava is also a major horticultural crop of the farmers of Jhajjar and Rahtak district of Haryana. This pest also causes huge reduction in yield in both these districts. KVK Jhajjar and Rohtak also used this technological option for management of fruit flies in guava (Variety-Allahabadi Safeda) and found it more effective. Thus, mass trapping of the male fruit flies with fruit fly specific para pheromones traps @ 25 traps/ha followed by need based insecticidal application is effective technological option for management of the fruit flies.

On Farm Trial with pheromone trap

(B) Integrated Disease Management

Integrated management of *Phytophthora* blight:

Colocasia is grown almost in every household in district Bilaspur of Himachal Pradesh. *Phytophthora blight* in colocasia is a major disease causing huge economic losses to the growers. Existing recommendations are not so effective for the control of this disease. Hence, KVK Bilaspur conducted an On Farm Testing on integrated management of this disease. The results revealed that corm dip with *Trichoderma viridae* @5g/kg of seed for an hour followed by one spray of Ridomil gold @ 0.25%) with sticker at appearance of disease gave higher yield (152.7q/ha) and less disease severity (25.3%). This treatment was found most effective as compared to farmer's practice and recommended practice.

On Farm Trial in Colocasia

Phytophthora blight is also a major disease of tomato causing huge economic losses to vegetable growers of Hamirpur district. Existing recommendations and practice adopted by

the farmer for the control of this disease is not so effective. So, KVK Hamirpur conducted On Farm Testing to assess the performance of new fungicide against the recommended practice and practice adopted by the farmers. The new assessed practice (spray of Azoxystrobin 23% followed by Mancozeb @0.25%) was found effective and recorded the least incidence of disease (12%) and higher yield (390q/ha) compared to other practices in management of *Phytophthora* blight in tomato.

Spray schedule for management of *Alternaria* blight and core rot in apple:

Apple is a major cash crop of Shimla district of Himachal Pradesh. High incidence of *Alternaria* blight and core rot in apple causing premature leaf fall and pre harvest fruit drop resulting in poor fruit quality and storage losses. Indiscriminate use of fungicides irrespective of stage of disease on the part of farmers is also not so effective. KVK Shimla conducted On Farm Testing and assessed different spray schedules for the management of this problem by laying out trials at five locations. Results showed that in schedule 1 (Spray of Mancozeb (600 g) at Pink Bud stage; Difenaconazole (30 ml) at Pea stage; Mancozeb (500g)+ Carbendazim (100 g) at Walnut size stage; Dodine (150g) at Fruit development (20 days after above spray) stage; Zineb (600g) at Fruit development (20 days after above spray) stage; and Ziram (600ml) at Pre-harvest stage) where fungicides sprays were given at six different stages of fruit development recorded lowest incidence of *Alternaria* spot/ blight (5.00%) and core rot (0.4 %) with highest yield (16.68 t/ha) and BC ratio (3.7), compared to schedule 2 and farmers' practice.

Integrated management of chilli wilt:

Wilting of plants, withering of leaves, dying of plants, poor quality fruits and poor fruit set are the major reasons for low productivity of chilli in Bandipora area of Jammu & Kashmir. Here, farmers do not follow crop rotation and crop is generally sown on flat beds with un-decomposed FYM. Hence, KVK Bandipora conducted On Farm Testing on integrated management of chilli wilt at three locations. It was observed that seed treatment with Mancozeb 75 WP @3gm/l of water, transplanting on raised beds, dipping seedlings before transplanting in Mancozeb 75 WP @2 gm +Carbendazim 50 WP @1gm/l of water+ soil drenching with Ridomil MZ 72 WP @ 2.5 gm/l of water resulted in to the maximum yield (10.5q/ha) of dry red chillies and less wilting of plants (4.3%) was observed with this treatment.

Management of Canker in apple:

Apple growers of Kashmir are facing the problem of canker in apple that causes huge loss to them. Farmers generally make use of mud plastering to control this disease however; this practice is not able to manage this problem. KVK Bandipora conducted On Farm Testing for the management of canker in the area. The results revealed that callus formation was better by using scarification with fungicidal paints of carbendazim and copper oxychloride with linseed oil and canker size reduced to 62 sq cm as compared with farmers' practice. Maximum (40%) "A" grade apple with maximum returns of Rs 900/box was observed under this treatment.

KVK Kulgam also conducted On Farm Testing for the management of canker in the area. The results revealed that maximum recovery of affected area (90%) was observed by scrapping the affected portion, pasting with a mixture of carbendazim, copper oxychloride and linseed oil.

Management of black scurf of potato:

Potato is one of the important crops grown in Ropar district of Punjab. Severe incidence of black scurf and unscientific method of its management is a great concern here. Hence, KVK Ropar conducted On Farm Testing to see the effect of fungicide application on disease incidence and potato yield. The observation revealed that seed treatment (Dip method treatment with moncern@2.5ml/liter) resulted in least disease incidence (0.9) with yield of 312.50 q/ha and maximum BC ratio (2.82).

(C) Integrated Nutrient Management

Soil test based application of fertilizers in maize for better productivity:

Maize is an important cereal crop grown by farmers under rainfed conditions in Bilaspur district of Himachal Pradesh. Imbalanced fertilization is the main reason for its low productivity in the region as farmers generally use FYM @ 5 tonnes/ha +125 kg urea in two split doses for raising this crop. KVK Bilaspur assessed the effect of application of NPK on soil test basis on its productivity. Results showed that FYM @ 10 tonnes/ha +application of NPK on soil test basis recorded higher maize yield (35.4 q/ha) with B:C ratio of 2.30 as compared to farmer's practice and recommended practice.

Enhancement of yield and quality of apple through foliar fertilization:

Apple is a major horticultural crop of Chamba district of Himachal Pradesh. In apple orchards, existing recommendation of fertilization with Urea @0.5% at the time of walnut

stage is not so effective for maintaining optimum size resulting in to low productivity. Ban on Calcium Ammonium Nitrate (CAN) fertilizer furthered the need for testing of some other alternatives in the region. KVK Chamba conducted On Farm Testing to refine the existing practice for enhancement of yield and quality of apple through foliar fertilization. Results showed that fertilization with Urea @ 0.5 % at pea and walnut stage followed by agromin in the month of May and June produced higher fruit yield (87.15 q/ha) as compared to the farmer's practice and recommended practice.

Evaluation of water soluble fertilizers in capsicum:

Soluble/ foliar nutrition is designed to eliminate the problems like fixation and immobilization of nutrients. Capsicum is one of the most important vegetable crops of Kullu district. The new varieties of capsicums are quite responsive to the chemical fertilizers for higher production and productivity. Recently, new generation soluble fertilizers have been introduced exclusively for foliar feeding. Hence, OFT was conducted to evaluate the effect of these soluble fertilizers on fruit yield of capsicum in addition to application of recommended NPK (100:75:55). It was observed from that the application of NPK @ 100:75:55 kg + FYM @ 20 t/ ha + 4 sprays of water soluble fertilizers i.e. NPK 19:19:19 @0.50% gave the highest average fruit weight (68.1 g), fruit yield (17.83 t/ha) along with the maximum B:C higher ratio of 3.80 as compared with other treatments.

Potassic & Zinc Fertilizer application in sugarcane:

Sugarcane is widely cultivated by the farmers in Ambala district, however, low productivity of sugarcane due to imbalanced fertilization has been noticed during the recent years. Low productivity of this crop is mainly attributed to overemphasis on nitrogenous and phosphatic fertilizers resulting in the deficiency of micronutrients in soil strata. KVK Ambala assessed the effect of application of potassic & zinc fertilizers in sugarcane and conducted On Farm Testing at three locations. The results showed that application of 100 kg MOP + 8 kg $ZnSo_4$ gave the increase cane girth (2.6 cm) and the higher yield (828 q/ha) as compared to other treatments selected under the OFT.

Effect of Calcium and Boron application in productivity of apple:

Since, apple is an important crop of Kashmir valley and farmers are facing problems of fruit drop and black depressions on the fruit, KVK Bandipora conducted On Farm Testing to assess the effect of Calcium and Boron application on quality and yield of apple (Cv. Red Delicious) in the area. The results revealed that maximum (64%) "A" grade apple was

recorded with two pre-harvest sprays of boric acid @0.2% and $CaNo_3$ @0.5% with recommended application of NPK. The percent internal corking was negligible in this treatment as compared to others. This treatment has also provided the maximum net returns (Rs 1250/plant).

Management of manganese deficiency in wheat:

Continuous flooding in paddy results in leaching of manganese. It consequently results in non-availability of manganese to subsequent wheat crop and poor yields. KVK Patiala conducted On Farm Testing at three locations in the district to assess the utility of soil test based manganese application on wheat yields. Results revealed that spray of $MnSO_4$ on soil test basis effectively enhanced the wheat yields. The yield was maximum (50.68 q/ha) in this treatment, followed closely by recommended practice of 3 sprays of manganese. The BC ratio was however at par with the treatment involving soil test based manganese application and recommended practice of three sprays of manganese.

On Farm Trial on INM in wheat

(D) Integrated Crop Management

Pollination management in apple through honey bee colonies:

Apple is the main horticultural crop in Kinnaur district of Himachal Pradesh. Pollination is the major reason for low productivity of apple in the region. Farmers generally depend upon natural pollination resulting into low fruit set and less productivity. Further, existing recommendation of keeping 2 bee colonies/0.08ha of orchard is also not so effective. So, KVK Kinnaur conducted On Farm Testing on pollination management in apple through honey bee colonies. Results showed that keeping 2 bee colonies/0.08ha + pollen dispenser in

apple orchards was found most effective as higher yield (113.2q/ha), higher fruit set (24.7±1.57) and less fruit drop in the month of June (13.2±1.99) was observed in this refined practice as compared to other practices.

Placement of Honey Bee Colony in Apple orchard

Evaluation of time of sowing in Direct Seeded Rice for weed management and yield enhancement:

Paddy is an important kharif season crop in the district of Fatehgarh Sahib and the farmers are resorting to direct sowing method. The late sown DSR, however results in heavy weed infestation and low yields. In order to study the appropriate time for DSR, KVK Fatehgarh Sahib conducted On Farm Testing at three locations with three dates of DSR sowing. Results showed that early sowing of rice under direct seeding not only enhanced the yield but also helped in managing the weed while late sowing coincides with onset of rainfall which leads to yield reduction by 7 to 15 per cent. Early sowing of rice (DSR) during last week of May resulted in higher net returns of Rs. 41973 per ha with BC ratio of 2.1.

Direct seeded rice

Effect of nodal pruning on fruit yield and quality in guava:

Guava is an important cash crop in district Faridkot, however lack of pruning results in low fruit yield and poor fruit quality of the fruits. Recommended pruning practice is removal of 10 cm shoot tip. However, farmers are of the view that it should be in terms of

how many nodes to be pruned. Henceforth, KVK Faridkot conducted On Farm Testing at three locations to assess the effectiveness of pruning techniques in terms of nodes on the quality and yield of guava. The average fruit yield/tree under farmers' practice was 65.5 kg whereas under recommended practice, it was 90.0 kg. On the other hand, removal of shoot tip up to 4 nodes and 6 nodes recorded fruit yield of 93.0 kg and 86.5 kg, respectively. Removal of shoot tip up to 4- nodes resulted in higher net returns and BC ratio of Rs. 213380/ha and 4.14, respectively.

Control of fruit drop in kinnow:

Kinnow is an important citrus group fruit grown in some parts of the Punjab fetching handsome returns to the growers. Pre harvest fruit drop, however is a major problem resulting in reduced yield. In order to assess the effectiveness of growth hormones in reducing fruit drop and enhancing yields, KVK Ludhiana conducted On Farm Testing at three locations in the district. The results of the trial revealed that both the treatments viz. foliar application of 2,4-D sodium salt @5 gm /acre (Horticulture Grade) + Bavistin 50 WP (500gm) or Ziram 27 SC (1250ml)+ 2,4-D (sodium salt of horticulture grade) (5 gm) or Propicononazole 25 EC (500 ml) +2,4-D (5gm) in mid April, August and September and two additional sprays of Ziram 27SC (1250ml) or propiconazole 25 EC (500ml) or bavistin 50WP (500gm) in end July and September in 500 liters of water and foliar application of salicylic (SA) (10 mg/ liter of water) + Potassium nitrate (1%) + zinc sulphate (0.25 %) in the month of June, August and October were at par in reducing the fruit drop compared to farmer's practice. The ultimate fruit yield per plant was also highest in the former treatment followed closely by the latter. The spray of both the growth regulators (2, 4-D and SA) and fungicides (Bavistin and Ziram) was quite effective in reducing the fruit drop and thus improving the overall yield.

Assessment of different techniques of cultivation of kharif onion:

Onion is an important cash crop in district Amritsar, however the yields are low and there is ample scope for improvement in onion yield by adopting the improved technology. In order to assess the effectiveness of different planting methods on onion yield and quality attributes, KVK Amritsar conducted On Farm Testing at three locations involving three planting methods viz. flat planting (15x7.5 cm), bed planting (12x7.5 cm) and flat planting (20x10 cm). The results revealed that bed planting at spacing of 12x7.5cm resulted in higher yield of 221.5 q/ha followed by flat planting at spacing of 15x7.5 cm (186.0 q/ha). These treatments recorded BC ratio of 2.42 and 2.08, respectively.

(E) Varietal Evaluation

Performance of different cultivars of apple in dry temperate ecosystem:

Apple is the main horticultural crop of farmers in dry temperate ecosystem of Kinnaur district of Himachal Pradesh. Royal delicious cultivar of apple is much prevalent among the orchardists however; low productivity from this cultivar has been noticed due to changing climate scenario during the past few years. KVK Kinnaur conducted On Farm Testing on varietal evaluation of new cultivars with the objective to replace the existing cultivar in the region. It was observed that Oregon Spur gave the highest yield (187.5q/ha) which was 87.5 % higher than the farmer's practice. Red chief also performed well as compared to the Royal delicious. Though, Red Chief is superior in bearing but takes a bit more to reach marketable maturity. It is therefore recommended that Oregon Spur can replace all other varieties of the region under changing climatic scenario.

Evaluation of promising basmati cultivars of paddy in Balh valley:

Paddy is the major Kharif crop grown by the farmers in Balh valley of Mandi district of Himachal Pradesh. The climate of the this valley is very much congenial for growing of scented varieties of paddy however, non availability of suitable scented paddy varieties is the main reason for its less adoption in the region. KVK Mandi assessed the performance of newly released variety (HPR 2612) in comparison to existing Kasturi variety. Results revealed that HPR 2612 recorded highest yield (47.29 q/ha) with benefit cost ratio of 2.9, compared to Kasturi and farmers' practice. This variety also performed well in other attributes as compared to other cultivars.

On farm trail on paddy var. HPR 2612

Performance of new cultivars of marigold:

KVK Rewari conducted an On Farm Testing to assess the performance of new cultivars of marigold. Generally, Hisar Beauty cultivar of marigold is much prevalent in the region, however; the productivity of this variety is quite less. Results showed that Pusa Narangi cultivar of marigold provided maximum yield (12t/ha) and performed best among all other treatments. It is therefore suggested that this variety should be grown in place of farmer's practice.

Performance of paddy varieties tolerant to shattering:

KVK Bandipora conducted On Farm Testing to assess the performance of shattering tolerant cultivars of paddy in the region. Farmers grow old varieties of paddy which are prone to heavy shattering and susceptible to various diseases. Results revealed that SR-2 gave the maximum yield (58q/ha) with higher returns and was average tolerant to shattering but good resistant against the blast disease. Hence, SR-2 may be recommended for its wider cultivation in the area.

Evaluation of *Bt* hybrids vis a vis non *Bt* varieties:

Cotton is an important crop in Faridkot district and farmers are cultivating non recommended Bt hybrids owing to limited availability of seed of non *Bt* varieties. In order to assess the performance of Bt hybrids vis a vis non Bt varieties, KVK Faridkot conducted On Farm Testing at three locations involving non-recommended Bt hybrid grown by the farmers (Mist), recommended Bt hybrid (NCS 855) and non Bt variety LH 2108. The results revealed that the recommended *Bt* hybrid NCS 855 and non Bt variety LH 2108 were better than non recommended Bt hybrid Mist.Recommended Bt hybrid NCS 855 resulted in highest yield of 2150 kg/ha followed by farmers practice (non recommended Bt hybrid, Mist) (1956 kg/ha) compared to recommended non Bt variety LH 2108. The BC ratio was however highest (1.69) in case of non Bt variety LH 2108 owing to low seed price followed by Bt hybrid NCS 855 (1.57).

(F) Weed Management

Effect of herbicides on weed management in maize:

Maize is commonly grown crop almost by majority of the farm families in Rajouri district of J &K. Many weed species are associated with this crop which compete with the

main crop for nutrition thus causing reduction in yield. Farmers generally, adopt hand hoeing and one earthing up practice in maize crop for the management of weeds. However, this practice is highly labour intensive and many a times availability of labour during the peak period remains a problem. Thus, KVK Rajouri assessed the effect of herbicides against the management of weeds in maize crop by laying out On Farm Testing at four locations. Results indicate that application of atrazine@1kg/ha along with one earthing up resulted in maximum yield production of maize grain (33q/ha). The labour cost was also cut down by the application of weedicides.

Chemical management of hardy weeds in wheat:

Wheat is the most important rabi season crop in Muktsar district, however incidence of weeds like *Rumex* & *Medicago* cause yield losses to the extent of 15-20 %. In order to assess the efficacy of various herbicides in reducing the weed count, KVK Muktsar conducted On Farm Testing at four locations in the district. Results revealed that tank mix application of Sencor @ 125g/ha and 2,4-D @ 625g/ha gave good control of hardy weeds viz. *Rumex dentatus*, *Rumex spinosis*, *Medicago denticulata* & *Trigonella polycerata* but not as good as Algrip (Metsulfuron) @25 g/ha. Application of Algrip (Metsulfuron) @ 8 g/ha (farmer practice) recorded higher weed population due to lower dose and incorrect spray technology.

(G) Resource Conservation

Composting of slaughter house waste:

Slaughter house waste comes in bulk in Kargil area of J &K state because of the large scale onslaught of domestic animals for meat consumption. But this huge quantity of slaughter house waste is not properly utilized because of its poor decomposition and causes inconvenience to public. The waste after decomposition can be used as compost for agriculture fields and supplement the use of synthetic fertilizers. KVK Kargil conducted On Farm Testing in this aspect and results showed that compost made from slaughter house waste +saw dust + effective microorganisms technology took less duration for complete decomposition as compared to other treatments.

Comparison of different methods of sunflower cultivation:

Sunflower is an important oilseed crop grown in many parts of district Nawansahar. However, improper sowing methods result in low yields. Hence KVK Nawansahar

conducted On Farm Testing to evaluate different methods of sowing for better yield. It was observed that sowing by dibbling on beds was found most effective in terms of yield and economics, followed closely by sowing by dibbling on ridges. The former treatment resulted in net returns of Rs. 27894 and BC ratio of 2.44.

(H) Farm Machinery

Evaluation of different spray pumps for weed control in wheat crop:

Wheat is a major crop grown in Ambala district under paddy-wheat production system. Many weed species are associated with this crop that causes huge reduction in the yield. Scarcity of labour, high labour input in spraying of weedicides and low field capacity of manually operated sprayers is the major problem encountered by the farmers in the region. KVK Ambala assessed the efficiency of manually operated tractor run high volume spray pump in comparison to manually operated battery run knap-sack spray pump and manually operated knap-sack spray pump by laying out on farm trials at three locations. The results showed that tractor run power sprayer uniformly applied the weedicides, which resulted into higher yield (47.50q/ha) along with good control of weeds (85%). It also has the high field capacity (3.2ha/day) with less requirement of labour. Therefore, farmers can use this labour saving technology to improve the yield of wheat and earn profit.

Performance of sowing of wheat with happy seeder:

Wheat is commonly grown under paddy-wheat cropping systems in Jhajjar and Jind area of Haryana. Conventional sowing with tractor is

Sowing of wheat with happy seeder

generally practiced by the farmers in the region resulting in to less profitability due to high cost of cultivation. KVK Jhajjar and Jind assessed the performance of sowing of wheat with happy seeder through On Farm Testing in comparison to sowing with zero tillage and conventional method of sowing under farmers practice. Results showed that sowing of wheat with happy seeder provided the higher yield (38q/ha in Jhajjar, 46q/ha in Jind) and higher returns than the other practices selected under the trial.

Comparative performance of wheat sowing methods under different straw management conditions:

Managing paddy straw before sowing of wheat crop is a matter of concern in many parts of the Punjab. Burning of paddy residues not only cause loss of nutrient and environmental pollution but also cause loss to the soil micro-biota. KVK Hoshiarpur therefore, assessed different methods of straw management viz. conventional method of sowing after burning of paddy residue, wheat sowing with zero till drill after bailing of paddy straw and wheat sowing with Roto-till-drill at three locations in the district. The results revealed that crop sown with zero till drill after bailing of paddy straw with baler yielded higher output along with improvement in soil health and environmental production. This treatment also resulted in highest BC ratio of 1.47, followed closely by wheat sowing with Roto till drill. The farmers also gave feedback that spreading of loose paddy straw manually is a tedious job before sowing of wheat with Happy Seeder therefore straw management system should be attached behind the combined harvester. Crop sown with zero till drill after bailing of paddy straw with baler yielded higher output along with improvement in soil health and environmental production

(I) Protected Cultivation

Performance of parthenocarpic cucumber hybrids under protected conditions:

Protected cultivation is emerging as an income generating enterprise among the farmers of Himachal Pradesh in general and Bilaspur district in particular. Cucumber is the most preferred crop grown by farmers under protected conditions due to its shorter growing season. However, farmers are not getting the optimum returns form cucumber cultivation due to poor performance of general cultivars under protected conditions. Difficulty in selection of cucumber variety/hybrids under protected cultivation on the part of farmers due to lack of

knowledge about monoecious/ gynoecious flowers is the another reason for its low productivity. Hence, KVK Bilapsur assessed the performance of different parthenocarpic cucumber hybrids under protected conditions. Results showed that Parthenocarpic cucumber variety Cloudia performed better followed by Kian under protected conditions and it is recommended that Parthenocarpic cucumber varieties should be planted instead of general varieties.

OFT in cucumber under protected cultivation

Assessment of suitable filler crops after harvest of capsicum under protected conditions:

Capsicum is generally grown by the farmers under protected conditions in Kullu and Mandi district of Himachal Pradesh. The polyhouse remain un-utilized during lean period i.e. from November to February after the harvest of capsicum. Therefore, KVK Kullu and Mandi assessed some of the short duration filler crops suitable to fit during the lean period for ensuring round the year cultivation and additional income to the growers. Results shows that the filler crop coriander gave the highest net returns and BC ratio followed by garden peas in Kullu district. Early garden pea from November- February resulted in higher net returns to the tune of Rs. 6350 with benefit cost ratio of 4.84 during lean period under protected conditions in Mandi district. It is therefore suggested that to get the additional income and efficient land use, coriander and garden pea can be grown successfully under protected conditions during lean period i.e. from November to February.

(J) Mushroom Cultivation

Assessment of different species of oyster mushroom for round the year cultivation:

Oyster mushroom is generally grown by farmers during summer season. In order to grow this mushroom round the year, KVK Chamba conducted On Farm Testing and assessed the performance of different species for its round the year cultivation. Results revealed that *P. florida* (92.2 Kg/q dry straw) in spring, *P. sajor-caju* (88.6 Kg/q dry straw) in summer and *P.*

ostreatus (90.2 Kg/q dry straw) in winter recorded the higher yield in comparison to other species grown in the same season.

Effect of supplementation of compost with wheat bran on productivity fresh mushrooms:

KVK Yamunanagar conducted On Farm Testing to assess the effect of supplementation in compost with wheat bran at spawning time for enhancing its productivity at two locations. The results revealed that significant increase in yield of fresh mushroom (7.02%) was recorded with addition of wheat bran in compost @ 200g/q compost over farmers' practice.

(K) Agro Forestry

Performance of agricultural crops in mahaneem based agrisilviculture system:

KVK Bhiwani conducted On Farm Testing to assess the performance of agricultural crops in mahaneem based agri-silviculture system. For this, oat with tree vs. oat without trees; mustard with tree vs. mustard without trees and wheat with tree vs. wheat without trees were evaluated. Results showed that mustard cultivation with mahaneem trees provided the maximum net returns of Rs. 8670/ha followed by oat (Rs. 4895/ha) and wheat (Rs. 3900/ha). However, oat and wheat cultivation without mahaneem plantation gave the net returns of Rs. 28160 and Rs. 25665 per hectare, respectively.

(L) Drudgery Reduction

Effect of application of weedicide and weeding with wheel hoe weeder in cauliflower:

Cauliflower is a major vegetable crop grown in Delhi region. High infestation of weeds causes reduction in its yield to a great extent. Manual weeding is generally practiced by the vegetable growers in the region however; this practice is highly labour intensive and sometimes causing drudgery to the growers. Hence, KVK Delhi conducted On Farm Testing on low cost wheel hoe to reduce the drudgery and labour cost in cauliflower production. Findings revealed that the application of recommended weedicide and weeding with wheel hoe weeder significantly resulted in less weeding cost (Rs. 4800/ha) as only 10 man days labour were utilized under this treatment.

Use of revolving stool to reduce drudgery in women during milking operation:

Dairy farming is the main domain activity of women in Gurgaon region of Haryana state. Women engaged in dairy farming generally do not use any stool causing muscular disorder due to incorrect posture during milking operation. In order to reduce the drudgery among the women, KVK Gurgaon conducted On Farm Testing and assessed the effect of revolving stool in comparison to static stool for reducing drudgery during milking operation. Findings showed that use of revolving stool while milking reduced the physiological and muscular stress among women and found to be highly acceptable as compared to other treatments selected under the trial. The women experienced lesser fatigue when used revolving stool as compare to static stool and pile of bricks during milking operation.

(M) Nutritional Management (Livestock)

Impact of balanced concentrate feeding on weight gain in female cow calves:

Imbalanced feeding by the livestock owners is the major reason for low weight gain and delayed puberty in heifers in Kullu valley of Himachal Pradesh. Hence, an On Farm Testing was conducted by KVK Kullu to assess the impact of Calf starter ration, calf grower ration and Heifer ration on weight gain in female cow calves. It was observed that the animals which were kept on the recommended nutrition plan attained puberty 7.58 months earlier with 24.05% higher weight gain. The age at first conception was also 8.58 months earlier than the control group. It is therefore recommended that better weight gain and low age of puberty can be attained in heifers by providing balanced concentrate ration.

Effect of feeding mineral mixture and de-wormer on production and reproduction performance in cross bred cows:

Balanced diet in case of dairy cattle is important for optimum milk production; hence use of mineral mixture and dewormer as integral component of dairy management is of immense use. Consequently KVK Patiala conducted an On Farm Testing on effect of supplementing the diet with mineral mixture and dewormer on production of high yielding dairy cattle. It was noticed from results that supplementation of feed with mineral mixture (50 gm) + Dewomer resulted in maximum average milk yield (11.5 l/ day), followed closely by supplementation of feed with mineral mixture alone. The BC ratio in both these treatments was also higher compared to farmers practice. Feeding of mineral mixture is associated with increase in milk yield and de-worming of animals further improves the yield and fertility

status of animals. By including mineral mixture and regular de-worming milk production can be enhanced to 26%.

(N) Disease Management (Livestock)

Integrated measures for management of mange in sheep:

Sheep rearing is very commonly practiced by the livestock owners in Kullu valley. Mange infestation in sheep is a common disease entity which results in poor health and low wool production. The disease reccurs within 2-3 weeks of treatment as the existing practice for the treatment of disease is not so effective. KVK Kullu conducted anOn Farm Testing and refined the existing practice of treatment. Findings showed that refined practice i.e. Ivermectin + application of benzyl benzoate + Deltamethrin to the surrounding environment gave the best results as the animals remained completely free from re-infestation till day 60 post treatment. It is therefore recommended that using Acaricides for treatment along with spraying animal environment with the insecticides is the better protocol for controlling mange infestation as it prevents re-infestation from the environment and leads to effective prevention of mange infections in animals.

Broad spectrum intra-mammary antibiotics for the management of Mastitis:

Mastitis is a very serious problem encountered by the livestock owners in Reasi area of J & K. Complete emptying of teats and washing with $KMnO_4$ solution is not so effective. Hence, KVK Reasi assessed the effect of broad spectrum intra-mammary antibiotics against these practices. Results showed that use of intra-mammary antibiotic resulted in complete cure (100%) of teat. In case of other treatments $KMnO^4$ & complete emptying of teats it did not show much improvement, but can act as supportive treatment.

(O) Production & Management (Poultry)

Strain evaluation for rural poultry farming:

Poultry farming is practiced by the rural people in Hamirpur district of Himachal Pradesh as a subsidiary occupation. Generally, local strains are being kept by the people both for egg laying and chicken purpose. The production from these local strains is not satisfactory as local strains take longer duration to lay eggs due to poor feeding and management practices. KVK Hamirpur evaluated two different strains (Chabro and Palam chicken) in comparison to local strain. Demonstrative farmers were supplied with day old chicks and

were guided about their brooding, feeding and management practices. Data on various parameters like age and body weight at first egg laying were recorded. Results showed that strain Palam Chicken started laying at 7 month 1weeks age with body weight of 1.6 kg while Chabro started laying at 7 month 3 weeks of age with body weight of 1.8 kg. The local birds lay at 8 months of age with body weight of 1.5 kg.

Supplementation of coriander seed powder for growth improvement of Broiler:

Poultry farming is practiced by farmers of Ambala district. Higher mortality due to poor growth of Broiler is the major reason for its low productivity in the region. KVK Ambala refined the existing practice by laying out an On Farm Testing at three locations. Results revealed that higher body weight (1040.50gm) and less mortality rate (9.37%) was observed in the refined practice (Basal diet +2.0 gm coriander seed powder per kg feed) as compared to recommended and farmers' practice.

(P) Fisheries

Impact of feed supplement on fish production:

Fish farming is emerging as an enterprise in Jammu district. However, farmers are not getting the expected returns due to the poor feeding. KVK Jammu conducted an On Farm Testing to evaluate the impact of feed supplements on production of fish in the area. Findings revealed that feeding with rice bran & oil cake mixed with mineral mixture @20gm/kg was found a superior practice than the other practices as it provided the maximum fish yield (43q/ha) and net returns. This practice improved the health, growth and production, and may be recommended in the area.

(Q) Foods & Nutrition

Supplementation of colocasia leaf rolls with different protein sources:

Colocasia leaf rolls are prepared and consumed in almost every house hold of Mandi, and Kangra district of Himachal Pradesh however, maize floor is used which is poor in quality protein and taste. KVK Mandi and KVK Kangra conducted an On Farm Testing for evaluation of colocasia leaf roll supplemented with different protein sources. For that leaf rolls were smeared with the paste of different protein sources like legumes and cereals. The data were analyzed on different parameters like taste/flavor, texture, acridity, colour and overall accepta-bility. Based on the sensory and taste evaluation on various parameters like

taste, flavor, texture acridity colour and overall acceptability, colocasia leaf rolls prepared using black gram flour were found to be most acceptable and nutritionally rich.

(R) Value Addition

Quality enhancement of local mango powder:

Surplus mango is available in plenty during peak season in Bilaspur district of Himachal Pradesh. Poor shelf life is the matter of concern as local people generally prepare mango powder by sun drying method. KVK Bilaspur conducted an On Farm Testing to assess the effects of different preservatives on its quality parameters using different treatments. Data were recorded on various parameters like Taste, shelf life, Colour, Flavour through organoleptic observations. It was observed that dipping mango slices (10 kg) in KMS solution @ 60 gm for 15 minutes followed by sun drying improved the colour, taste, flavor and shelf life of the mango powder. This treatment was found the best compared with others as per organoleptic observations.

(S) Entrepreneurship Development

Evaluation of surf preparation methods:

Surf preparation is an easy time entrepreneurship for farm women as the material required for surf preparation is easily available in the local market. The procedure to prepare surf is easy and it is not harmful for skin. The farm women are engaged in surf preparation activity, however the method used by them is improper resulting in poor quality. Hence KVK Hoshiarpur conducted an On Farm Testing to evaluate different methods of surf preparation for better quality. It was noticed that method recommended by Home Science College, PAU Ludhiana (Acid Slurry-500 g., Soda Ash-3 Kg., Non-ionic-100 g., Globar Salt-1.5g., Sodium Lauryl sulphate-100 g) was found to be acceptable by farm women on the parameters of cost, effect on hands and neatness of cloths. This treatment resulted in maximum returns of Rs. 9 per kg.

(T) Storage Techniques

Application of various levels of sulphur on shelf life of onion:

Sprouting of onion during storage is a major problem in Bandipora region. KVK Bandipora conducted an On Farm Testing to assess the effect of application of various levels

of sulphur on shelf life of onion during storage. It was observed that application of Sulphur 20Kg/ha + curing + with holding of irrigation one month before harvest gave the best results over other treatments and farmers' practice as the sprouting started 120 days after the harvest.

Effect of improved packaging on quality of dried apricots:

Excessive drying and improper packaging leads to the loss of total produce and poor market price of the dried apricots. Most of the Kargil apricot produce is dried without proper packaging leading to quality deterioration during storage. KVK Kargil designed the an On Farm Testing to check the moisture escape and quality deterioration and improve the economic gains to the farmers even after a year of storage till the new crop is harvested. HDPE polythene bags used for storing dried apricot were found to be superior to other material used as it retained about 17% moisture even after three months of storage.

Pulsing of Gladiolus spikes with sugar and citric acid to enhance the shelf life:

Gladious (Cv. Peter Pears) is an important cut flower grown by farmers in Kupwara district of J&K state. Poor Shelf life of cut spikes is the main reason responsible for less returns to farmers here. The shelf life of cut spikes is about six days as farmers do not treat the spikes for increasing its shelf life. KVK Kupwara conducted an On Farm Testing to assess the effect of pulsing of spikes with sugar and citric acid on its shelf life. The results revealed that pulsing of spikes with sugar 5%+citric acid 2% enhanced the shelf life of cut spikes up to eight days.

3.1.2 FRONTLINE DEMONSTRATION

Frontline demonstrations (FLDs) were conducted by KVKs to demonstrate the production potential of newly released crop varieties and production technologies in crops, livestock and fisheries for enhancing production and income generation through successful technologies and agriculture related enterprises on the farmers' fields in a given farming system. During the year, a total of 10363 demonstrations were conducted covering an area of 2686.91 ha and 383 units. Under crops 9457 frontline demonstrations were conducted by the KVKs. Highest number of demonstrations were conducted in cereal crops (3210) followed by oilseeds (2215), pulses (1957), vegetables (1404), cotton (277), fodder crops (260), spices (40), commercial crops (34), fruits (34) and flowers (32) in an area of 2399.52 ha. Further, the KVKs also conducted 193 FLDs related to livestock; 28 on enterprises, 482 on farm implements, 194 on home science related activities and 3 on Integrated Farming System (IFS) during the year (**Table 14**).

Table 14: Overview of Frontline Demonstrations implemented

Category	**No. of farmers**	**Area (ha)**	**Units**
Crops			
Cereals	3210	1118.49	
Oilseeds	2215	630.96	
Pulses	1957	396.86	
Vegetables crops	1404	91.62	
Commercial crops	34	17.60	
Fodder crops	260	51.70	
Cotton	277	81.40	
Flowers	32	2.39	
Fruit crop	34	8.00	
Spices	40	0.50	
Total	**9463**	**2399.52**	
Livestock			
Dairying	128		180
Piggery	5		25
Poultry	60		150
Total	**193**		**355**
Others			

Category	No. of farmers	Area (ha)	Units
Enterprises	28		28
Farm implements	482	285	
Home Science	194		
Integrated Farming System	3	2.40	
Total	**707**	**287.4**	**28**
Grand Total	**10363**	**2686.92**	**383**

The crop-wise results recorded under FLDs on various technologies under given farming situations conducted at the farmers' fields during 2014-15 are detailed as below:

3.1.2.1 Cereals: Demonstrations were conducted to establish the production potential of improved technologies of cereal crops like paddy, basmati, wheat, maize and baby corn in all the states of the zone. A total of 3210 demonstrations were conducted in 1118.49 ha on these cereals during the year. Average yield obtained was high in paddy (61.19 q/ha), followed by basmati (42.02 q/ha), wheat (41.30 q/ha), maize (38.33 q/ha) and baby corn (23.81 q/ha) as compared to 56.05, 39.57, 37.58, 30.86 and 16.00 q/ha, respectively in their local checks. Technologies such as leaf colour chart, irrigation scheduling by the use of tensiometer, Integrated Disease Management, Integrated Pest Management, Integrated Weed Management, Integrated Nutrient Management, Resource Conservation Technology and improved varieties in paddy, basmati, maize and wheat have led to impressive yield gains as compared to farmers' practices. The average yield improvement recorded in FLDs was 9.16 per cent in paddy, 6.18 per cent in basmati, 9.90 per cent in wheat and 24.19 per cent in maize (**Table 15**). The BCR recorded was higher in the demonstrations as compared to their local check, which ranged from 1.59 in baby corn to 3.61 in basmati.

Table 15: Performance of frontline demonstrations in cereal crops

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase	BCR	
			Demo	Check	(%)	Demo	Check
Wheat	1529	533.75	41.30	37.58	9.90	2.47	2.25
Maize	700	204.15	38.33	30.86	24.19	2.1	1.76
Basmati	499	171.34	42.02	39.57	6.18	3.65	3.61

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase	BCR	
			Demo	Check	(%)	Demo	Check
Paddy	462	208.25	61.19	56.05	9.16	3.09	2.86
Baby corn	20	1.00	23.81	16.00	48.81	1.75	1.59
Total	**3210**	**1118.49**					

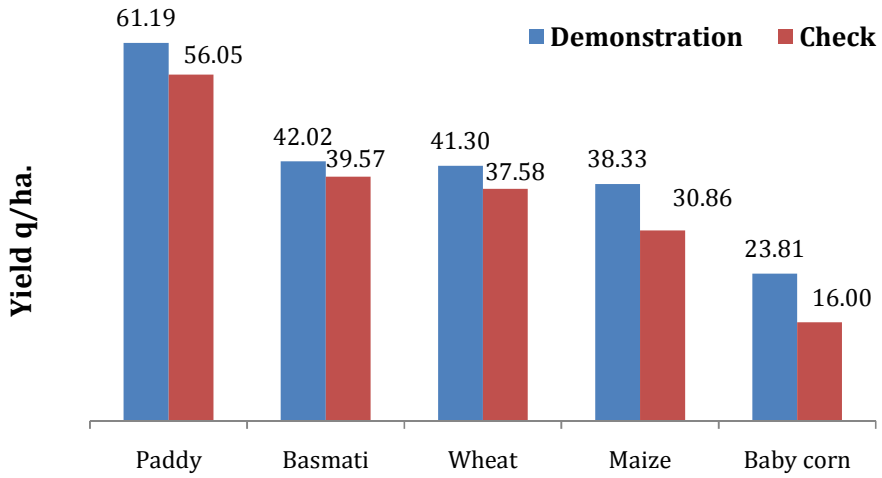

Fig 3: Comparison of yield (q/ha) of demonstrated cereal crops w.r.t check

FLD on Integrated Nutrient Management in Basmati

FLD on Integrated Disease Management in Maize

The details of state-wise performance of cereals are given as below:

Table 16: Performance of frontline demonstrations in cereal crops

State	No. of Farmers	Area (ha)	Yield (q/ha)		% Increase	BCR	
			Demo	Check		Demo	Check
Wheat (Punjab)	542	217.56	43.56	40.34	7.97	2.60	2.40
Wheat (Haryana)	509	219.76	46.00	42.94	7.12	2.31	2.09
Wheat (J&K)	373	74.05	23.02	16.75	37.46	2.24	1.88
Wheat (HP)	94	17.98	31.13	24.40	27.60	3.11	3.03
Wheat (Delhi)	11	4.40	43.83	37.55	16.70	1.94	1.65
Maize (J&K)	449	131.35	34.23	25.64	33.53	2.12	1.66
Maize (HP)	97	21.00	36.84	31.25	17.89	2.04	1.89
Maize (Punjab)	84	24.80	55.81	49.09	13.71	1.69	1.56
Maize (Haryana)	70	27.00	43.33	39.22	10.48	3.01	2.79
Babycorn (HP)	20	1.00	23.81	16.00	48.81	1.75	1.59
Basmati (Punjab)	216	63.54	40.86	40.31	1.36	4.26	3.97
Basmati (Haryana)	198	79.80	40.12	36.17	10.90	3.10	2.89
Basmati (Delhi)	85	28.00	50.09	47.59	5.24	4.38	4.21
Paddy (PB)	188	76.80	67.98	66.46	2.27	3.63	3.38
Paddy (J&K)	157	57.05	47.92	39.68	20.79	2.53	2.38
Paddy (HR)	100	69.00	64.49	59.63	8.14	1.85	1.64
Paddy (HP)	17	5.40	62.59	53.74	16.47	2.91	2.80
	3210	**1118.49**					

3.1.2.2 Oilseeds: During the year, 2215 number of frontline demonstrations were conducted in oilseed crops like sunflower, gobhi sarson, raya, toria, brown sarson, til, groundnut and soybean, etc. covering an area of 630.96 ha (**Table 17**). The difference in yield varied from 9.80 per cent in sunflower to 53.50 per cent in til as compared to check. The technologies demonstrated in the FLDs on oilseeds were ICM, IDM, varietal demonstration, complete package in the state of Punjab, Haryana & Delhi and IPM; and complete package and improved varieties in the state of Himachal Pradesh and Jammu & Kashmir. These technologies have resulted into significant increase in the yield and found acceptable to the farmers. The BCR of the demonstrations show that these technologies are cost effective and will prove to be remunerative for the farmers.

FLD in Mustard

FLD in Sunflower

Table 17: Performance of frontline demonstrations in oilseeds

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase (%)	BCR	
			Demo	Check		Demo	Check
Gobhi sarson	726	180.15	12.75	10.31	23.6	2.77	2.47
Raya	627	230.92	17.16	15.12	13.51	2.99	2.82
Brown Sarson	224	104.50	9.77	7.85	24.53	4.24	3.3
Soyabean	197	25.93	13.94	10.47	33.11	2.26	2.11
Til	166	20.25	6.02	3.93	53.3	2.42	2.28
Toria	162	26.41	17.16	15.12	13.51	2.99	2.82
Sunflower	97	41.00	18.76	17.09	9.8	2.39	2.23
Groundnut	16	1.80	20.16	16.96	18.86	2.31	2.05
Total	**2215**	**630.96**					

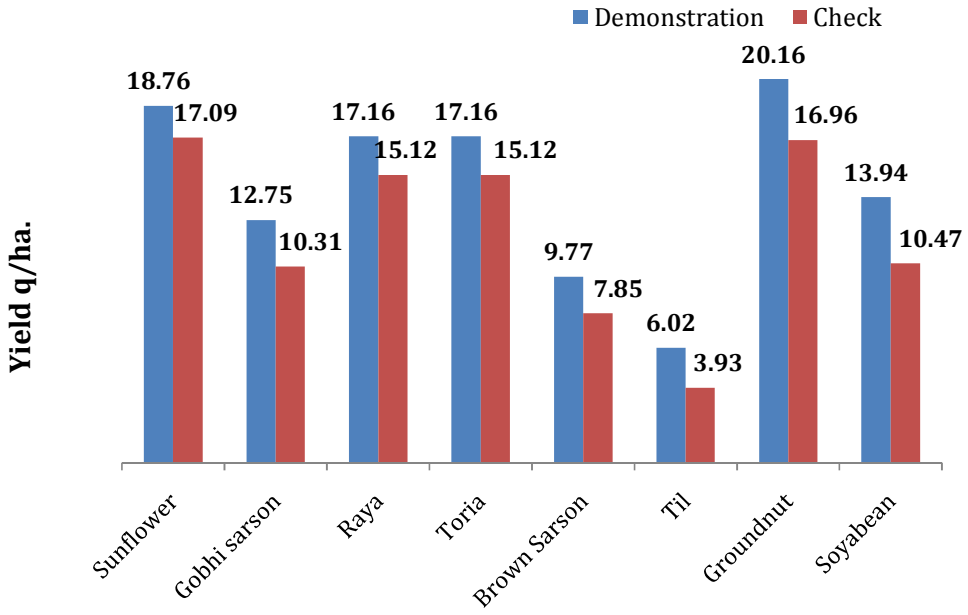

Fig. 4: Comparison of yield (q/ha) of demonstrated oilseed crops w.r.t check

The details of state-wise performance of oilseed crops are given as below:

Table 18: Performance of frontline demonstrations in oilseed crops

State	No. of Farmers	Area (ha)	Yield (q/ha)		% Increase	BCR	
			Demo	Check		Demo	Check
Raya (Haryana)	335	148.00	19.98	18.13	10.23	3.38	3.17
Raya (Himachal Pradesh)	113	20.92	7.84	5.77	35.84	2.10	1.82
Raya (Punjab)	108	42.00	16.32	13.76	18.54	4.29	3.62
Raya (J&K)	66	18.00	6.41	4.15	54.51	1.75	1.27
Raya (Dehli)	5	2.00	20.25	17.25	17.39	3.75	3.56
Gobhi Sarson (Punjab)	300	83.15	14.44	13.12	10.06	2.69	2.59
Gobhi Sarson (Himachal Pradesh)	224	41.00	10.08	6.50	55.08	3.24	2.62
Gobhi Sarson (J&K)	137	30.00	6.43	4.67	37.81	2.15	1.79
Gobhi Sarson (Haryana)	65	26.00	18.82	13.85	35.81	2.34	1.96
Brown Sarson (J&K)	179	101.50	9.80	7.92	23.64	2.40	2.09
Brown Sarson (HP)	45	3.00	9.00	5.29	69.96	6.70	4.92
Soyabean (HP)	171	16.33	13.70	8.56	60.06	2.52	2.38
Soyabean (Punjab)	26	9.60	14.35	13.73	4.51	2.00	1.85
Toria (HP)	128	18.41	7.46	5.43	37.55	3.24	3.08
Toria (J&K)	34	8.00	5.30	3.81	39.02	2.42	1.90

State	No. of Farmers	Area (ha)	Yield (q/ha)		% Increase	BCR	
			Demo	Check		Demo	Check
Til (HP)	121	13.60	5.17	3.26	58.32		
Til (J&K)	36	3.05	4.95	3.88	27.56	2.25	1.94
Til (Haryana)	9	3.60	6.77	5.54	22.20	3.17	2.93
Sunflower (Punjab)	75	29.20	18.44	17.18	7.30	2.55	2.41
Sunflower (Haryana)	15	11.00	20.18	17.49	15.38	2.18	2.06
Sunflower (J&K)	7	0.80	11.00	8.00	37.50	1.87	1.47
Groundnut (Punjab)	16	1.80	20.16	16.96	18.86	2.31	2.05
Total	**2215**	**630.96**					

3.1.2.3 Pulses : A total of 1957 frontline demonstrations were conducted in pulse crops like summer black gram, kharif moong, arhar, lentil, rajmash, cowpea, cluster bean and chickpea, etc. on an area of 396.86 ha. The FLDs conducted during the year in Punjab, Haryana, Himachal Pradesh and Jammu & Kashmir states have clearly demonstrated that improved technologies of the pulse crops could result into potentially higher yields than the respective state averages. The improved technologies of pulses have resulted in significant yield gains, which ranged from 9.84 per cent in cluster bean to 62.73 per cent in Rajmash.

Table 19: Performance of frontline demonstrations in Pulses

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase	BCR	
			Demo	Check	(%)	Demo	Check
Summer Black Gram	459	80.05	10.28	8.28	24.23	2.49	2.32
Gram	327	75.96	13.46	11.14	20.76	3.52	2.93
Summer Moong	313	90.80	7.39	6.08	21.51	4.06	3.79
Rajmash	188	14.30	7.29	4.48	62.73	4.66	3.83
Chickpea	175	49.00	17.09	15.46	10.57	2.15	1.77
Lentil	169	22.40	10.31	8.71	18.33	2.37	1.93
Cowpea	125	13.50	13.69	10.27	33.27	2.78	2.44
Arhar	101	24.25	14.14	12.19	15.93	3.94	3.74
Kharif Moong	94	24.20	6.64	5.81	14.32	2.61	2.39
Cluster bean	6	2.40	11.83	10.77	9.84	1.16	1.08
Total	**1957**	**396.86**					

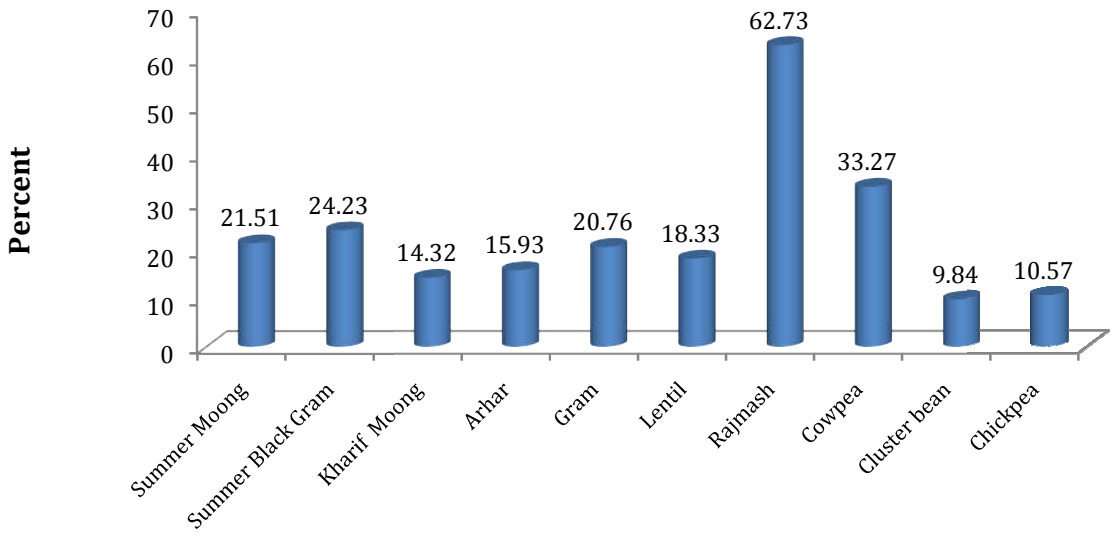

Fig.5 : Yield improvements in Frontline Demonstrations conducted on pulses.

The details of state-wise performance of pulses are as below:

Table 20: Performance of frontline demonstrations in pulses

State	No. of Farmers	Area (ha)	Yield (q/ha)		% Increase	BCR	
			Demo	Check		Demo	Check
Summer black gram (Punjab)	245	45.00	10.61	9.11	16.54	2.49	2.43
Summer black gram (HP)	179	30.20	7.65	5.11	49.56	2.37	2.00
Summer black gram (J&K)	30	2.85	4.20	2.80	50.00	2.78	2.42
Summer black gram (Haryana)	5	2.00	6.90	6.00	15.00	3.07	2.97
Summer moong (Haryana)	161	54.00	5.93	5.08	16.65	3.91	3.72
Summer Moong (Punjab)	127	32.80	10.10	8.15	23.89	4.50	3.90
Summer Moong (J&K)	15	2.00	5.00	2.00	150.00	2.40	2.20
Summer Moong (HP)	10	2.00	4.57	3.00	52.33	5.05	3.30
Chickpea (Haryana)	149	46.00	17.17	15.61	9.98	2.12	1.91
Chickpea (Haryana)	26	3.00	15.90	13.10	21.37	2.23	1.31
Gram (HP)	124	17.00	8.50	5.83	45.96	3.62	2.70
Gram (Punjab)	104	28.64	14.60	12.30	18.65	3.81	3.33
Gram (Haryana)	69	26.00	15.70	13.75	14.17	3.21	2.98
Gram (J&K)	30	4.32	11.89	8.69	36.80	3.22	2.37

State	No. of Farmers	Area (ha)	Yield (q/ha)		% Increase	BCR	
			Demo	Check		Demo	Check
Rajmash (HP)	107	7.33	14.27	7.79	83.19	5.94	4.51
Rajmash (J&K)	81	14.30	3.71	2.78	33.34	3.10	2.63
Cowpea (HP)	103	11.00	10.83	7.08	53.05	3.15	2.86
Cowpea (J&K)	15	1.00	8.13	6.52	24.69	1.61	1.18
Cowpea (Haryana)	7	1.50	38.35	36.20	5.94	2.84	2.41
Moong (Haryana)	84	22.20	7.22	6.32	14.24	2.78	2.51
Moong (J&K)	10	2.00	0.23	0.15	53.33	1.79	1.60
Lentil (HP)	54	4.00	7.13	4.63	54.05	2.46	1.75
Lentil (Punjab)	51	10.90	11.98	10.77	11.27	1.73	1.37
Lentil (J&K)	44	3.00	4.44	2.83	56.82	1.81	1.50
Lentil (Haryana)	20	4.50	12.99	11.28	15.17	4.42	3.92
Arhar (Haryana)	40	14.00	15.52	14.29	8.65	3.61	3.24
Arhar (HP)	33	4.00	10.66	7.18	48.57	5.98	4.84
Arhar (Punjab)	28	6.25	11.70	8.10	44.44	1.77	1.28
Clusterbean (Haryana)	6	2.40	11.83	10.77	9.84	1.16	1.08
Total	**1957**	**404.19**					

FLD on Mash

FLD on Gram

3.1.2.4. Vegetable crops: A total of 1404 demonstrations were conducted on various vegetables comprising chilli, potato, onion, pea, brinjal, tomato, cabbage, broccoli, cucumber, okra, bottle gourd, sponge gourd, turnip, radish, carrot, knol khol and water melon. The

maximum number of demonstrations were conducted on pea (294) followed by cabbage (237), tomato (138), knol khol (137), chilli (99), bottle guard (89), brinjal (84), turnip (62), onion (44), okra (34), radish (25), carrot (22), potato (20), broccoli (15), summer squash (10), water melon (5) and sponge gourd (4).

The difference in yield recorded under FLDs as compared to check ranged from 5.89 per cent in broccoli to 50.00 per cent in Water melon (**Table 21**). The BCR was also higher with technology demonstration as compared to checks in all the vegetables, which ranged from 1.68 in cucumber demo against 1.52 in check to 6.02 in sponge gourd demo against 5.48 in check.

In general, ICM, INM, IPM combined with improved varieties demonstrated through FLDs have resulted in higher gains in terms of yields and economic returns to the farmers.

FLD on cultivars of onion

FLD on High Yielding cabbage Var. Mitra

Table 21: Performance of frontline demonstrations on Vegetable Technologies

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase	BCR	
			Demo	Check	(%)	Demo	Check
Pea	294	32.80	62.56	46.25	35.27	2.34	2.11
Cabbage	237	10.67	209.25	159.68	31.05	2.86	2.06
Tomato	138	6.75	298.74	236.89	26.11	2.56	1.03
Knol khol	137	6.05	191.43	159.22	20.23	2.48	2.21

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase	BCR	
			Demo	Check	(%)	Demo	Check
Chilli	99	2.40	81.83	56.25	45.48	2.21	1.54
Bottle gourd	89	3.05	254.00	236.00	7.63	1.95	1.81
Cucumber	85	2.25	143.12	126.37	13.25	1.68	1.52
Brinjal	84	2.00	140.00	100.00	40.00	1.75	1.46
Turnip	62	2.04	212.21	162.10	30.91	2.37	2.00
Onion	44	5.45	233.39	179.22	30.22	2.48	1.80
Okra	34	1.71	116.65	89.22	30.75	4.74	4.15
Radish	25	1.00	180.00	140.00	28.57	2.03	1.91
Carrot	22	1.00	150.00	120.00	25.00	2.00	1.76
Potato	20	6.50	272.54	244.54	11.45	2.01	1.85
Broccoli	15	4.00	106.02	100.13	5.89	3.79	1.83
Summer Squash	10	0.45	258.89	202.44	27.88	2.88	2.27
Water melon	5	2.50	225.00	150.00	50.00	2.21	1.53
Sponge gourd	4	1.00	102.15	88.65	15.23	6.02	5.48
Total	**1404**	**91.62**					

3.1.2.5. Fodder crops: Among fodder crops, 260 demonstrations were conducted during the year covering an area of 51.70 ha. The fodder yield increase was in the range of 11.07 per cent in barley to 27.07 in sorghum under FLDs as compared to local check **(Table 22).** The BCR ranged from 1.38 in barseem to 3.59 in maize under demonstration plots. The introduction of improved varieties of fodder crops has given higher benefits to farmers in terms of forage yield and returns.

FLD on Fodder Oat Var. Kent

FLD on Fodder Maize Var. J1006

Table 22: Performance of frontline demonstrations in Fodder crops

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase	BCR	
			Demo	Check	(%)	Demo	Check
Oat	131	24.85	166.51	146.88	13.36	1.96	1.65
Maize fodder	59	9.60	419.69	342.94	22.38	3.59	2.93
Barley	25	8.25	47.69	42.94	11.07	1.53	1.33
Sorghum	20	2.00	460.00	362.00	27.07	2.00	1.57
Bajra	15	3.00	551.55	491.50	12.22	4.17	3.71
Barseem	10	4.00	789.80	697.50	13.23	1.38	1.22
Total	**260**	**51.70**					

3.1.2.6. Flower and medicinal plants: During the year, 32 demonstrations on flower crops like marigold and chrysanthemum were conducted in 2.39 ha area **(Table 23).** The per cent yield difference recorded under FLDs as compared to check was 52.48% in chrysanthemum and 24.46% in marigold. The adoption of improved varieties with improved crop management practices and INM in marigold and improved varieties in chrysanthemum have emerged as frontier technologies for up-scaling the flower production.

Table 23: Performance of frontline demonstrations on Flowers

Crop	No. of farmers	Area (ha)	Yield (q/ha)		Yield increase	BCR	
			Demo	Check	(%)	Demo	Check
Marigold	21	1.75	65.23	52.41	24.46	4.77	2.58
Chrysanthemum	11	0.64	33.80	22.17	52.48	2.35	1.61
Total	**32**	**2.39**					

3.1.2.7. Fruit and spice crops: A total of 34 demonstrations on kinnow and apple were conducted on 8.00 ha area. The percentage yield difference recorded as compared to check was 26.97 per cent in kinnow and 19.64 % in apple. The BCR for kinnow was 3.74 while that for apple was 3.35 in demonstration plots. In spices, a total of 40 demonstrations were conducted on turmeric in an area of 0.495 ha.

FLD in apple orchard

Cotton: A total of 277 demonstrations were conducted on cotton covering an area of 81.4 ha in Punjab and Haryana. In Punjab, 227 demonstrations were conducted on Non Bt cotton varieties viz. LH-2108, FDK 124 and FMDH-9. In Haryana, 50 demonstrations were conducted on cotton covering an area of 20 ha. Demonstrations on thematic areas like integrated crop management and integrated nutrition management were conducted in Punjab and Haryana.

3.1.2.8 Livestock and poultry: KVKs of Zone-I conducted 128 demonstrations on mineral mixture and balanced feeding in cattle/buffaloes taking 180 animals in Punjab, Haryana and Jammu & Kashmir. The dairy technologies like use of mineral mixture; vitamin A&E and silage feeding have resulted in considerable increase in milk yield of animals. Besides, 5 demonstrations on pig production and 60 demonstrations on backyard poultry production were also conducted in by KVKs of Haryana and Jammu & Kashmir, respectively.

3.1.2.9 Farm implements and other enterprises: KVKs, during the year, conducted 482 demonstrations on improved farm implements covering an area of 285.00 ha on *Direct Seeding of Rice* (DSR), wheat sowing by happy seeder and zero till drill, management of paddy straw by baler cum knotter and paired row trench method of sugarcane planting by trench digger. Among enterprises, KVKs of Ambala, Kaithal, Fatehabad and Ferozepur have encouraged mushroom cultivation by conducting 28 demonstrations involving 28 farmers. The maximum per cent yield increase in the improved technologies of mushroom cultivation compared to check was recorded at 17.65.

3.1.2.10 Home Science Aspects: As many as194 demonstrations were conducted on home science aspects. Improved technologies such as use of solar cookers, solar dryers, cotton bags for picking of okra & marigold and water filter (*Janta water filter*) etc. were demonstrated among the farmwomen in the states of Punjab, Haryana and Himachal Pradesh. These technologies have been found to be acceptable by the farm women and resulted in reduction of physical stress to the farmwomen and use of renewable sources of energy.

FLD on Solar Drver

3.1.3 Capacity Development

Under capacity development 8006 training courses were organized by the KVKs in which approx. 2.00 lakh participants got benefited. Out of 8006 courses, 2768 courses were organized by 18 KVKs of Haryana, 2654 courses by 20 KVKs of Punjab, 1389 courses by 19 KVKs of Jammu & Kashmir, 1104 courses by 12 KVKs of Himachal Pradesh and 91 courses by the KVK of Delhi. Eighty four per cent of these courses (6746) were organized to meet the needs of farmers/farmwomen/rural youth (young farmers) and extension functionaries. KVKs organized 672 vocational training courses benefitting 17300 participants, including mostly the rural youth, young women and school dropouts. Besides these need based courses, KVKs organized 588 sponsored courses for 22997 participants. State-wise number of courses and the participants in these different categories of trainings is given in **table 24**. State-wise per cent distribution of courses also is given in **Fig.: 6.**

Table 24: Details of training courses organized by the KVKs

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
Punjab	20	2228	41116	121	3895	305	7055	2654	52066
Haryana	18	2354	60349	207	7326	207	6416	2768	74091
Delhi	1	81	1875	1	24	9	196	91	2095
Himachal Pradesh	12	831	26511	197	7958	76	1931	1104	36400
Jammu & Kashmir	19	1252	30680	62	3794	75	1702	1389	36176
Total	**70**	**6746**	**160531**	**588**	**22997**	**672**	**17300**	**8006**	**200828**

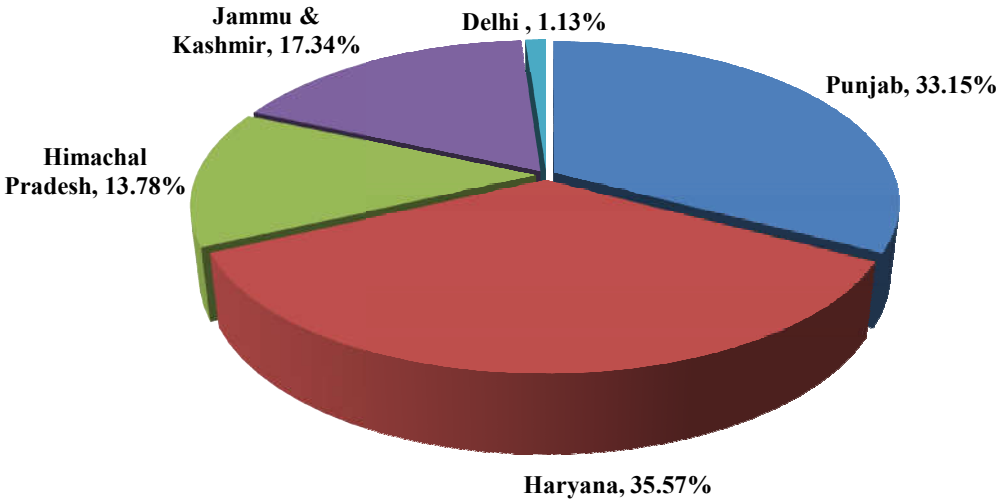

Fig. 6: *Percentage share of training courses in different states of Zone*

Zone-I comprises of two types of topographical regions - hill and plain. In terms of participation, KVKs of plain region accounted for 63.86 per cent of participants whereas KVKs of hill region accounted for 36.14 per cent of participants. The percent share of participants in trainings organized by KVKs of each state during 2014-15 is given in **Fig. 7**.

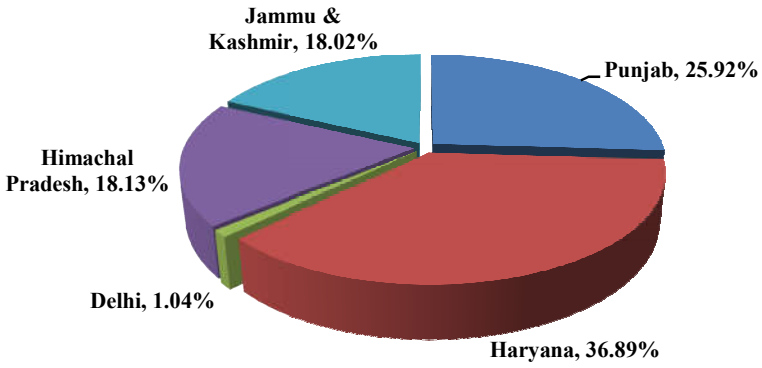

Fig. 7: *Percentage share of participants in different states of Zone*

3.1.3.1: Training courses for farmers and farm women.

A total of 5057 courses were organized for farmers and farmwomen by the KVKs during the periods under report, involving approx. 1.20 lakh participants **(Table 25)**. Maximum of 1921 courses were organized in Haryana followed by 1454 courses in Punjab, 962 courses in Jammu & Kashmir, 666 courses in Himachal Pradesh and 54 courses in Delhi. These courses involved 87076 men and 33399 women as participants. The state-wise

participation of SC/ST community and farmwomen reveals the fact that Haryana had better participation of SC/ST (9716 out of 29602 participants) and Himachal Pradesh had better participation of women participants (9964 out of 33399 women participants).

Table 25: State wise details of training courses organized for farmers/ farm women

State/ UT	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Punjab	1454	15668	4667	20335	2421	2199	4620	18089	6866	24955
Haryana	1921	31331	7431	38762	5768	3948	9716	37099	11379	48478
Delhi	54	659	238	897	213	20	233	872	258	1130
Himachal Pradesh	666	7523	6312	13835	4021	3652	7673	11544	9964	21508
Jammu & Kashmir	962	14538	2506	17044	4934	2426	7360	19472	4932	24404
Total	**5057**	**69719**	**21154**	**90873**	**17357**	**12245**	**29602**	**87076**	**33399**	**120475**

Training courses for farmers and farmwomen were organized in the 12 major areas related to agriculture and allied sectors, the details of which are given in **table 26**. Most number of courses were organized on horticulture (914) followed by plant protection (832), crop production (791), home science/women empowerment (692) and soil health and fertility management (493). Maximum participation was also recorded in horticulture (23802) followed by 19529 participants in plant protection. Maximum number of women farmers participated in home science/women empowerment (16838) followed by horticulture (4832) and crop production (3004). Specific training aspects under the major themes of training are given in Annexure and **table 30**.

Training on Rural Crafts for farmwomen

Training on Bee- keeping

Table 26: Details of thematic area wise courses organized and participants under farmers/ farmwomen.

Thematic area	No. of Courses	No. of Participants		
		Men	Women	Total
Crop Production	791	15077	3004	18081
Horticulture	914	18970	4832	23802
Soil Health and Fertility Management	493	9228	1560	10788
Livestock Production and Management	425	8331	1866	10197
Home Science/Women empowerment	692	747	16838	17585
Agril. Engineering	202	3608	440	4048
Plant Protection	832	17464	2065	19529
Fisheries	48	631	135	766
Production of Inputs at site	61	1073	378	1451
Capacity Building and Group Dynamics	332	6598	1662	8260
Agro-forestry	225	4503	532	5035
Sericulture	42	846	87	933
TOTAL	**5057**	**87076**	**33399**	**120475**

3.1.3.2: Training Courses for rural youth

KVKs trained 30059 rural youth by organizing a total of 1144 training courses. The state wise distribution of these training courses reveal that 554 courses were organized in Punjab followed by 281 in Haryana, 152 in Himachal Pradesh, 145 in Jammu & Kashmir and 12 in Delhi. The number of rural youth who participated in the KVK training courses reveals that 12687 participants were recorded in Punjab followed by 8734 in Haryana, 4758 in Himachal Pradesh, 3504 in Jammu & Kashmir and 376 in Delhi. The details are given in table 31. Among 30059 rural youth trained, 9410 were SC/ST (31.31 per cent) and 10327 were women (34.35 per cent).

Table 27: State wise details of training courses organized for Rural Youth

State/ UT	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Punjab	554	7166	2078	9244	1835	1608	3443	9001	3686	12687
Haryana	281	3350	1700	5050	1769	1915	3684	5119	3615	8734
Delhi	12	164	168	332	30	14	44	194	182	376
Himachal Pradesh	152	1759	1423	3182	841	735	1576	2600	2158	4758
Jammu & Kashmir	145	2375	466	2841	443	220	663	2818	686	3504
Total	**1144**	**14814**	**5835**	**20649**	**4918**	**4492**	**9410**	**19732**	**10327**	**30059**

The thematic area wise categorization of courses related to rural youth revealed that most number of training courses were organized on beekeeping (192) followed by of value

addition (110), with a participation of 5422 and 3060 rural youth respectively **(Table 28)**. Other major areas which, involved rural youth are dairying (79 courses, 2521 participants), mushroom production (79 courses, 1584 participants). Maximum number of women in the rural youth category preferred training related to value addition (2567) followed by tailoring and stitching (940) area.

Training to rural youths on training and prunning

Training on Motor Rewinding for Rural Youth

Training on making of fish seed

Table 28: Training area wise details of courses organized and participants under rural youth.

Training Area	No. of courses	No. of Participants		
		Male	Female	Total
Bee-keeping	192	4754	668	5422
Value addition	110	493	2567	3060
Dairying	79	2057	464	2521

Training Area	No. of courses	No. of Participants		
		Male	Female	Total
Mushroom Production	79	1108	476	1584
Tailoring and Stitching	61	143	940	1083
Training and pruning of orchards	56	847	115	962
Protected cultivation of vegetable crops	53	953	467	1420
Marketing, SHG, Kitchen gardening etc.	41	696	241	937
Vermi-culture	38	653	331	984
Sheep and goat rearing	37	515	315	830
Rural Crafts	37	52	862	914
Post Harvest Technology	36	487	624	1111
Seed production	35	736	210	946
Small scale processing	34	720	316	1036
Poultry production	33	946	42	988
Planting material production	32	754	175	929
Nursery Management of Horticulture crops	31	914	200	1114
Commercial fruit production	28	552	228	780
Sericulture	23	278	140	418
Repair and maintenance of farm machinery and implements	21	501	59	560
Integrated farming	14	316	166	482
Production of organic inputs	11	366	92	458
Rabbit farming	8	128	85	213
Production of quality animal products	8	188	129	317
Fry and fingerling rearing	7	121	15	136
Cold water fisheries	6	0	113	113
Piggery	6	128	5	133
Shrimp farming	6	66	31	97
Ornamental fisheries	6	64	9	73
Freshwater prawn culture	5	28	99	127
Composite fish culture	4	67	38	105
Quail farming	3	39	68	107
Pearl culture	3	22	37	59
Fish harvest and processing technology	1	40	0	40
TOTAL	**1144**	**19732**	**10327**	**30059**

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 29**. The data indicated that a total of 545 courses were organized with a participation of 9978 extension functionaries. Among the different states, 220 courses in Punjab followed by 152 courses in Haryana, 145 courses in Jammu & Kashmir, 15 courses in Delhi and 13 courses in Himachal Pradesh. In terms of participation, about 34.82 per cent of these participants were recorded in Punjab (3474 out of a total of 9978). Extent of SC/ST and women participation in different states indicates that

Punjab recorded higher participation from SC/ST community (605 out of a total of 1503) and women extension functionaries (977 out of a total of 2167).

Table 29: State wise details of training courses organized for extension functionaries

State/ UT	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Punjab	220	2278	591	2869	219	386	605	2497	977	3474
Haryana	152	2108	470	2578	371	170	541	2479	640	3119
Delhi	15	320	48	368	0	0	0	320	48	368
Himachal Pradesh	13	95	87	182	42	21	63	137	108	245
Jammu & Kashmir	145	2146	332	2478	232	62	294	2378	394	2772
Total	**545**	**6947**	**1528**	**8475**	**864**	**639**	**1503**	**7811**	**2167**	**9978**

The details of training courses organized for extension functionaries during the year are given in **table 30**. Maximum participation was recorded in the area of productivity enhancement in field crops wherein 74 courses (out of 545) attracted 1786 extension functionaries (out of a total of 9978). Other areas of interest for extension functionaries were integrated pest management (97 courses, 1533 participants) and integrated nutrient management (51 courses, 998 participants). Participation of women extension functionaries was maximum in the area of women and child care (627 out of 2167).

Table 30: Training area wise details of courses organized and participants under extension functionaries.

Training area	No. of courses	No. of Participants		
		Male	Female	Total
Integrated Pest Management	97	1476	57	1533
Productivity enhancement in field crops	74	1643	143	1786
Integrated Nutrient management	51	975	23	998
Rejuvenation of old orchards	38	541	62	603
Protected cultivation technology	34	761	22	783
Women and Child care	34	0	627	627
Low cost and nutrient efficient diet designing	28	125	540	665
Group Dynamics and farmers organization	27	213	149	362
Production and use of organic inputs	21	445	37	482
Care and maintenance of farm machinery and implements	21	230	11	241
Household food security	21	14	184	198
Management in farm animals	19	326	49	375
Information networking among farmers	15	69	84	153
Livestock feed and fodder production	15	247	19	266

Training area	No. of courses	No. of Participants		
		Male	Female	Total
Scaling up of water productivity in Agriculture	12	172	6	178
Gender mainstreaming through SHGs	11	77	62	139
Formation and Management of SHGs	11	240	21	261
Capacity building for ICT application	9	152	39	191
Nutrition Gardening	7	105	32	137
Total	**545**	**7811**	**2167**	**9978**

3.1.3.4: Sponsored Training Courses

A total of 588 sponsored training courses were organized by the KVKs during reporting period **(Table 31).** Haryana had maximum number of sponsored training courses 207 courses followed by Himachal Pradesh 197 courses, Punjab 121 courses and Jammu & Kashmir 62 courses. But the extent of participants was highest in Himachal Pradesh with 7958 participants, followed by Haryana with 7326 participants, Punjab with 3895 participants and J&K with 3794 participants. Out of 22997 participants, 8619 were from SC/ST community (37.47 per cent) and 7319 were women (31.82 per cent).

Table 31: State wise details of sponsored training courses organized and distribution of participants

State/ UT	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Punjab	121	1806	802	2551	651	635	1288	2460	1435	3895
Haryana	207	4267	560	4827	1329	1170	2499	5596	1730	7326
Delhi	1	0	21	21	0	3	3	0	24	24
Himachal Pradesh	197	2893	1919	4812	1773	1383	3146	4666	3292	7958
Jammu & Kashmir	62	1768	343	2110	1149	495	1683	2956	838	3794
Total	**588**	**10734**	**3645**	**14321**	**4902**	**3686**	**8619**	**15678**	**7319**	**22997**

Under sponsored courses category, 138 courses were conducted in area of the crop production and management followed by 91 in the area of beekeeping and 88 live Stock production and management with a participation of 6156, 2815 and 3173 participants respectively. Details of sponsored training are described in **table 32**.

Table 32: Thematic area wise details of sponsored training courses organized and distribution of participants

Thematic area	No. of Courses	No. of Participants		
		Male	Female	Total
Crop production and management	138	4558	1598	6156
Beekeeping	91	2207	608	2815
Livestock production and management	88	2786	387	3173
Home Science	58	73	1690	1763
Post harvest technology and value addition	52	662	1382	2044
Production and value addition	49	1302	291	1593
Agricultural Extension	49	2023	997	3020
Methods of protective cultivation	28	597	126	723
Soil health and fertility management	19	1072	163	1235
Production of Inputs at site	8	190	24	214
Farm machinery	8	208	53	261
Total	**588**	**15678**	**7319**	**22997**

3.1.3.5: Vocational Training Courses

During the reporting period, 672 vocational training courses were organized by KVKs with the participation of 17300 participants. In Punjab, KVK organized 305 courses with a participation of 7055 participants. In Haryana, KVKs organized 207 courses with 6416 participants. Details of number of courses and participants in each State/UT of the Zone-I are given in table 33. Participation of women was encouraging in vocational training courses with a participation of 38.46 per cent (6654 out of 17300).

Table 33: State wise details of vocational training courses organized and distribution of participants

State/ UT	No. of Courses	No. of Participants								
		General			SC/ST			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Punjab	305	3120	1623	4743	1408	904	2312	4528	2527	7055
Haryana	207	2637	801	3438	1323	1655	2978	3960	2456	6416
Delhi	9	81	86	167	16	13	29	97	99	196
Himachal Pradesh	76	1104	743	1847	52	32	84	1156	775	1931
Jammu & Kashmir	75	681	542	1223	224	255	479	905	797	1702
Total	**672**	**7623**	**3795**	**11418**	**3023**	**2859**	**5882**	**10646**	**6654**	**17300**

Vocational training courses were organized on 5 major areas as detailed in **table 34**. Most courses were conducted on income generation activities with 262 (out of 672) courses

for 6902 participants. Livestock and fisheries were the second most preferred area for vocational training with 182 courses and 5370 participants.

Table 34: Thematic area wise details of vocational training courses organized and distribution of participants

Thematic area	No. of Courses	Male	Female	Total
Income generation activities	262	4219	2683	6902
Livestock and fisheries	182	4574	796	5370
Post harvest technology and value addition	103	181	2239	2420
Crop production and management	77	870	358	1228
Agricultural Extension	48	802	578	1380
Total	**672**	**10646**	**6654**	**17300**

KVKs are documenting the effect of training courses on the back home situation of participants through necessary follow up actions and feedback studies. Further they are also identifying farmers as well as resource experts for conducting training courses for different stakeholders.

Training on soil testing for extension personnel

Training in floriculture

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 agriculture related technologies among farmers on a large scale. In this process the coordination with development departments and private agencies is crucial for successful executing 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.

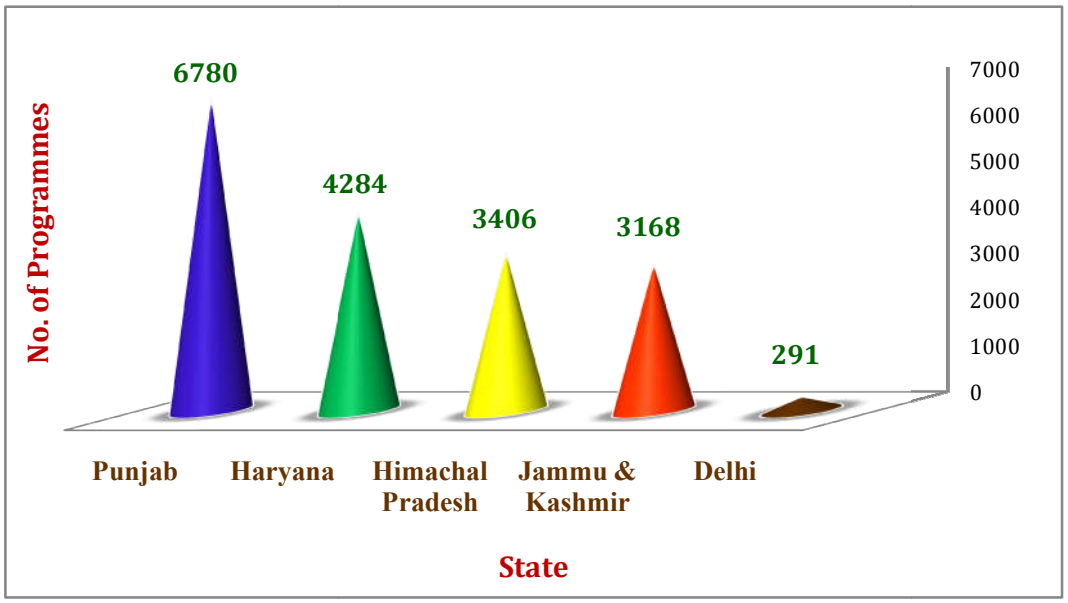

Fig.8. State wise details of frontline extension programmes organized

A total of 17929 extension programmes were organized through different methods and means wherein technologies related to agriculture and allied sectors were appraised among 6.98 lakh farmers and 0.21 lakh extension personnel 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. Data

further indicated that KVKs in Punjab organized maximum extension programmes (6780) followed by Haryana (4284), Himachal Pradesh (3406), Jammu & Kashmir (3168) and Delhi (291). **Fig.8** indicates the extension programmes organized by different states during the reporting period.

The activity wise details of extension programmes organized are furnished in **Table 35**. Data implies that KVKs' efforts through extension programmes covered a large number of farmers and created awareness about new technologies, activities and agri-enterprises.

Table 35: Activity wise extension programmes organized and distribution of participants

Activity	Mo. Of Programmes	Participants											
		No. of farmers			SC/ST (Farmers)			Extension Officials			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Field Days	373	11224	1630	12854	2166	774	2940	1129	292	1421	**14519**	**2696**	**17215**
Kisan Mela	97	57933	21574	79507	7002	2826	9828	2145	853	2998	**67080**	**25253**	**92333**
Kisan Gosthies	345	11063	2156	13219	2538	1291	3829	356	70	426	**13957**	**3517**	**17474**
Exhibition	357	90665	16615	107280	28408	12020	40428	4646	3021	7667	**123719**	**31656**	**155375**
Method Demonstration	2514	19932	5888	25820	5466	3172	8638	735	671	1406	**26133**	**9731**	**35864**
Group Meeting	555	6841	709	7550	1310	297	1607	279	92	371	**8430**	**1098**	**9528**
Advisory Service	2430	30891	3292	34183	3871	1981	5852	155	59	214	**34917**	**5332**	**40249**
Farmer Seminar	41	3570	786	4356	295	144	439	204	43	247	**4069**	**973**	**5042**
Film show	608	7144	1191	8335	2870	1566	4436	134	70	204	**10148**	**2827**	**12975**
Workshop organized	104	1122	287	1409	158	96	254	342	49	391	**1622**	**432**	**2054**
Scientist visit	1381	31988	3025	35013	7691	3253	10944	284	36	320	**39963**	**6314**	**46277**
Farmer visit		43435	5727	49162	7723	2993	10716	340	92	432	**51498**	**8812**	**60310**
Exposure visit	906	7813	2644	10457	1750	1453	3203	171	67	238	**9734**	**4164**	**13898**
Diagnostic visit	2443	5782	919	6701	1647	718	2365	179	87	266	**7608**	**1724**	**9332**
Extrainee sammeelan	36	599	592	1191	161	294	455	23	22	45	**783**	**908**	**1691**
Soil test camp	176	2372	468	2840	332	97	429	33	7	40	**2737**	**572**	**3309**
Soil health camp	114	2016	320	2336	425	162	587	53	7	60	**2494**	**489**	**2983**
Animal health camp	93	4313	2539	6852	930	301	1231	108	28	136	**5351**	**2868**	**8219**
Important days celebration	210	7292	4262	11554	1513	2537	4050	326	239	565	**9131**	**7038**	**16169**
Lecture delivered	4226	95109	14490	109599	12371	5520	17891	2552	832	3384	**110032**	**20842**	**130874**
Mahila Mandals	8	176	161	337	40	40	80	5	2	7	**221**	**203**	**424**

Activity	Mo. Of Programmes	Participants											
		No. of farmers			SC/ST (Farmers)			Extension Officials			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Self Help Groups	144	415	1025	1440	172	364	536	44	47	91	**631**	**1436**	**2067**
Farmer club	90	438	852	1290	124	55	179	6	17	23	**568**	**924**	**1492**
Extension literature distributed	627	21310	2451	23761	4208	1538	5746	249	61	310	**25767**	**4050**	**29817**
Agri mobile clinic	51	3096	572	3668	302	254	556	116	29	145	**3514**	**855**	**4369**
Zone Total	**17929**	**466539**	**94175**	**560714**	**93473**	**43746**	**137219**	**14614**	**6793**	**21407**	**574626**	**144714**	**719340**

The different participants participated in the various extension programmes organized by different KVKs of five states of Zone are presented in **table 36**.

Table 36: State wise frontline extension programmes organized and distribution of participants

Name of the State	No. of activities	Participants											
		Farmers (Others)			SC/ST (Farmers)			Extension Officials			Grand Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Punjab	6780	261176	53193	314369	47392	20210	67602	8502	5198	13700	317070	78601	395671
Haryana	4284	105235	15006	120241	15321	7742	23063	3047	803	3850	123603	23551	147154
Delhi	291	10840	2783	13623	1948	650	2598	50	0	50	12838	3433	16271
Himachal Pradesh	3406	33463	18785	52248	14114	10803	24917	1163	395	1558	48740	29983	78723
Jammu & Kashmir	3168	55825	4408	60233	14698	4341	19039	1852	397	2249	72375	9146	81521
Total	**17929**	**466539**	**94175**	**560714**	**93473**	**43746**	**137219**	**14614**	**6793**	**21407**	**574626**	**144714**	**719340**

In respect of utilizing mass media KVKs popularized technologies through newspaper coverage (1921), extension literature (627), popular articles (390), TV talks (438) and radio talks (274) State-wise details of extension programmes are presented in **Table37**.

Table 37: State-wise extension programmes organized for mass contact

Activity	No. of programmes					Total
	Punjab	Haryana	Delhi	Himachal Pradesh	Jammu & Kashmir	
Newspaper coverage	519	905	7	156	334	1921

Activity	No. of programmes					Total
	Punjab	Haryana	Delhi	Himachal Pradesh	Jammu & Kashmir	
Extension Literature	173	294	15	67	98	647
Popular articles	156	140	1	55	38	390
TV talks	136	79	25	18	180	438
Radio Talks	118	50	16	22	68	274

KVKs has organized a total of 17929 number of extension programmes and created awareness among 6.98 lakh farmers and 0.21 lakh extension personnel and public on various aspects like varietal performance, production technologies, resource conservation technologies, protected cultivation, diversification through horticulture and floriculture, net house technologies, Integrated Pest and Disease Management, animal health and nutrition, production of animal, poultry, crop, human nutrition etc.

Diagonostic visit to farmers field

Demonstration on mechanical transplanting of Paddy

Kisan Mela at KVK, Patiala

Exhibition stall put by KVK, Muktsar

Animal Camp by KVK, Ambala

Swachh Bharat Abhiyan by KVK

3.1.5 Technology week

Technology week is being organized by KVKs to demonstrate and create awareness among the stakeholders about the latest technologies on various aspects of agriculture and allied sectors generated by NARS. Normally it is observed for a period of 4 to 6 days. A total of 13048 farmers 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 108 agencies, technical programmes including 59 kisan ghosties, 365 lectures from eminent scientists and experts, 64 exhibitions, 54 film shows, 163 visits to the KVK farm and 290 method demonstrations on hands on experience.

In addition, 407.4 quintals of high yielding varieties/hybrid seeds, 33523 planting materials and 2430 literature related to latest technologies in agriculture were made available to participating farmers, farm women, extension officials and other stakeholders.

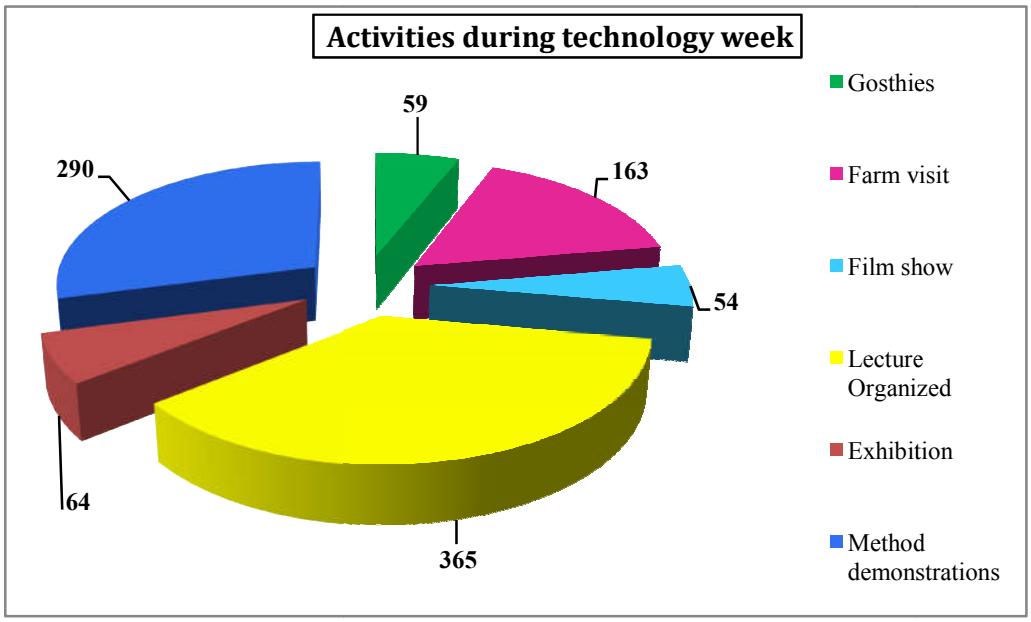

Fig.9: *Number of different activities conducted during the celebration of technology week by KVKs.*

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 to the farmers at the right time. KVKs are sending information via SMS to farmers advising them on the vital issues of agricultural importance and contingency planning in case of failure of monsoon during the year. During the reporting period, 41 KVKs have advised farmers regularly on the areas of crops, livestock, other enterprises, weather, marketing and awareness of latest agricultural technologies through the text depending on the expertise and facility available with them **(Table 38).** A total of 2642 messages have been sent to 42160 farmers. The messages were mainly on crops (1401), awareness among the farmers about agriculture related technologies (452), livestock (253), other enterprises related to agriculture (240), weather (233) and marketing (63). (**Fig. 10**)

Table 38: Details of Kisan Mobile Advisory by KVKs

Name of the State	No. of farmers Covered	No. of Messages (Text)	Type of messages					
			Crop	Livestock	Weather	Marketing	Awareness	Other enterprise
Punjab	15112	1263	591	143	96	49	241	143
Haryana	10595	688	383	29	79	2	155	40
Delhi	1000	49	26	6	5	0	3	9
Himachal Pradesh	9514	348	261	24	6	2	24	31
Jammu & Kashmir	5939	294	140	51	47	10	29	17
Total	**42160**	**2642**	**1401**	**253**	**233**	**63**	**452**	**240**

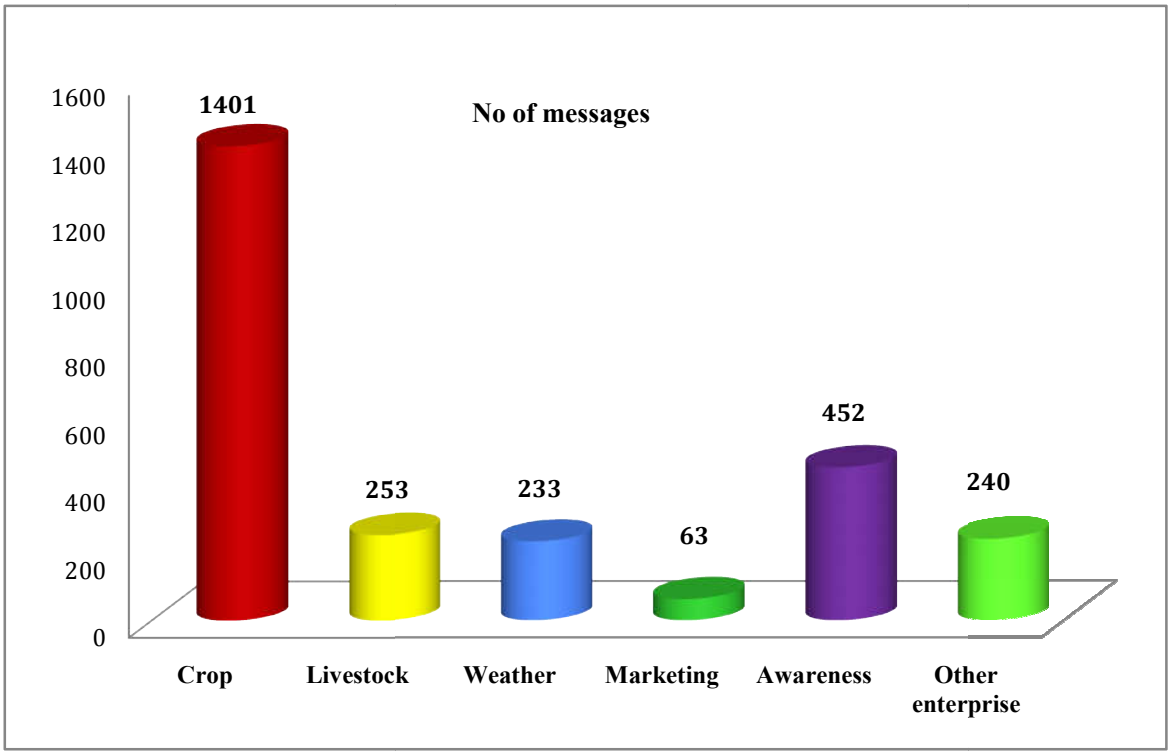

Fig.10: *Number of text messages sent to farmers on various fields in Agriculture*

3.1.7 E-Connectivity

The e-linkage has been provided to selected KVKs and 8 Zonal Project Directorates during XI Plan. In Zone-I, e-linkage facility was established in 27 KVKs along with ICAR-Zonal Project Directorate, Ludhiana. State wise list of KVKs provided with this facility is depicted in **Table 39**. These KVKs have been connected electronically through VSAT to the KVK Hub established at Agricultural Extension Division, New Delhi. The communication between KVKs across the country was enabled though IP phones provided to each KVK. Using this facility, following e-seminars were webcasted from the KVK hub during 2014-15 involving various experts **(Table 40).**

Table 39: Details of KVKs with E-Connectivity facility

State	No. of KVKs	Name of KVK
Punjab	**9**	Bathinda, Faridkot, Ferozepur, Gurdaspur, Hoshiarpur, Kapurthala,Nawanshahar, Patiala, Sangrur
Haryana	**9**	Hisar, Faridabad, Yamunanagar, Rohtak, Sonipat, Panipat, Karnal, Rewari, Gurgaon
Himachal Pradesh	**6**	Shimla, Kangra, Hamirpur, Sirmour, Kullu, Mandi
Jammu & Kashmir	**3**	Leh, Pulwama, Jammu
Total	**27**	

Table 40: Details of Webcast Programmes in 2014-15

Sl. No.	Topic of the Programme	Date
1.	"Writing of research and popular articles for different target audience"	19th August, 2014
2.	"Water Management in Major Kharif Crops"	3rd September, 2014
3.	"Mushroom Productions: Technologies & Best Practices"	16th September, 2014

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 material and bio-products and supply them to needy farmers.

During the period under report, KVKs have produced 12799.62 q seed of crop varieties and 158.52 q bio-fertilizers and supplied to 25303 and 1056 farmers respectively. Further KVKs produced 1069 number of bio-agents and supplied to 700 farmers. KVKs produced 24.00 lakh number of planting materials and 3.86 lakh number of livestock and fisheries worth Rs.32.28 lakh and 9.99 lakh and supplied to 19718 and 236 farmers respectively **(Table 41).**

Table 41: Production and supply of technological inputs

SI. No.	Category	Quantity	Value(Rs. in lakh)	Farmers (No.)
1	Seeds of crop varieties(q)	12799.62	270.47	25303
2.	Bio-fertilizer (q)	158.52	5.38	1056
3.	Bio-Agents(No.)	1069	1.07	700
4.	Planting Material (no. in lakh)	24.00	32.28	19718
5.	Livestock and fisheries (no. in lakh)	3.86	9.99	236
	Total		**319.19**	**47013**

Table 42: State-wise production of seeds and planting materials by KVKs

State	Seeds			Planting Material		
	Quantity (q)	Value (Rs. in lakh)	Farmers (No.)	Quantity (lakh)	Value (Rs. in lakh)	Farmers (No.)
Punjab	8937.47	190.59	19715	0.56	1.37	885
Haryana	2721.90	51.43	1172	0.94	4.58	740
Delhi	167.06	7.08	3154	-	-	-
Himachal Pradesh	382.09	15.06	370	20.74	23.28	11477
Jammu & Kashmir	591.10	6.30	892	1.77	3.04	6616
Total	**12799.62**	**270.47**	**25303**	**24.00**	**32.28**	**19718**

3.1.8.1 Seeds

KVKs in Punjab have produced the highest quantity (8937.47 q) of seeds followed by KVKs of Haryana, Himachal Pradesh, Jammu & Kashmir and Delhi **(Table 42)** and Fig 11). The KVKs of Haryana supplied the produced seed to **Haryana Seeds Development**

Corporation Limited (HSDCL) for distribution among the farmers. Out of total quantity of seed produced, the highest quantity was on cereals (11448.95q) followed by vegetables, oilseeds, fodder, pulses, commercial crop, others and spices.

Bed preparation for layout nursery

Seed sowing in nursery

Table 43: Crop category wise production of seeds

Crop category	**Quantity (q)**	**Value (Rs. in lakh)**	**Farmers (No.)**
Cereals	11448.95	216.21	13922
Oilseeds	282.89	7.63	3952
Pulses	179.21	14.31	1096
Commercial crops	14.83	0.73	285
Vegetables	577.03	12.77	4363
Spices	0.07	0.01	0
Fodder crop seeds	200.96	18.35	1651
Others (Sunhemp, Sugarcane & Mushroom)	95.68	0.46	34
Total	**12799.62**	**270.47**	**25303**

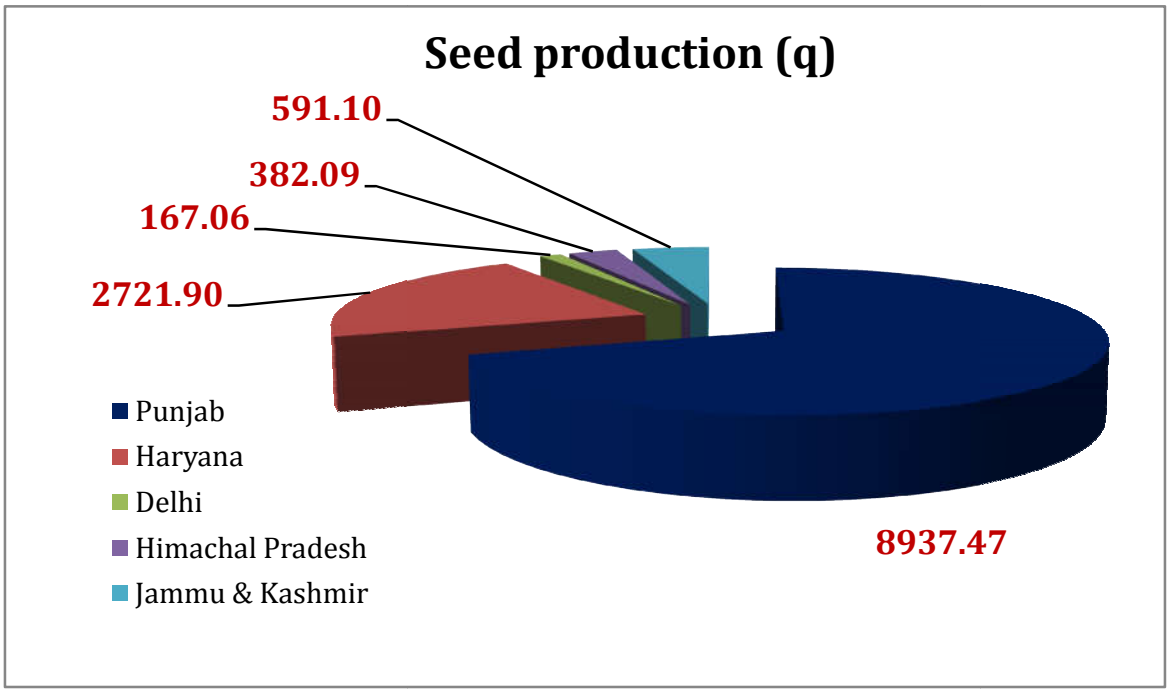

Fig.11: *State wise seed Production (q) by the KVKs of Zone-I*

3.1.8.2 Planting materials

KVKs in Himachal Pradesh have produced more number of planting materials of crops (20.74 lakh) followed by KVKs in Haryana, Jammu & Kashmir and Punjab **(Table 44 and Fig. 12)**. Out of total 24.00 lakh planting material 12.25 lakh were vegetable seedlings and the rest were fruit crops, flower crops, fodder slips and forest species.

Mat type Nursery

KVK Scientist advising nursery grower for disease management

Table 44: Crop category wise production of planting materials

Crop category	Quantity (lakh)	Value (Rs. in lakh)	Farmers (No.)
Vegetable seedlings	12.25	5.58	14137
Fruits	0.54	16.69	4375
Flowers	0.03	0.08	125
Fodder crop saplings	11.15	5.55	1039
Forest species	0.03	4.37	42
Total	**24.00**	**32.28**	**19718**

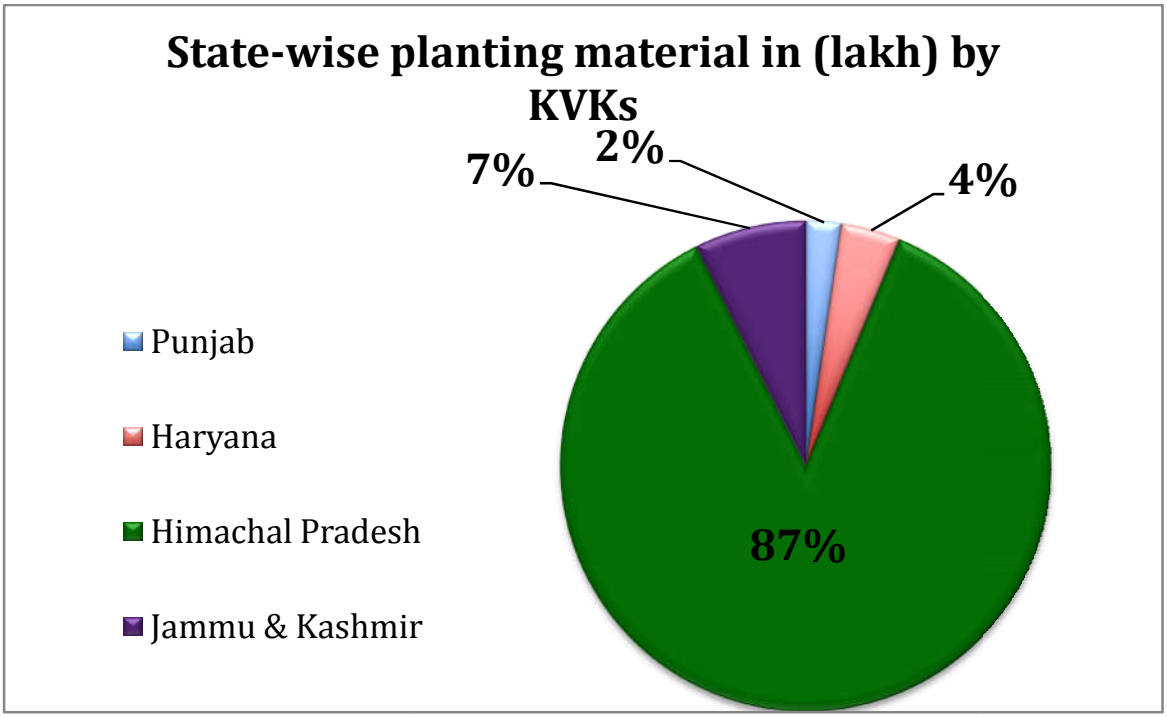

Fig.12*: *State wise planting material in (percentage)

3.1.8.3 Bio-Products

KVKs in Haryana have produced the highest quantity of bio-products followed by KVKs in Himachal Pradesh and Jammu & Kashmir. Out of total bio-products highest quantity of bio-fertilizers were produced for demonstration among farmers of Haryana

supplied by KVK Gurgaon followed by bio-product (Pheromone Traps) by KVK, Mandi of Himachal Pradesh. **(Table 45)**

Table 45: State wise production of bio-products

State	Quantity (q)	Quantity (No.)	Value (in lakh)	Farmers (No.)
Haryana	104.47	--	0.52	37
HP	23.05	1069	5.67	1719
J&K	31.00	--	0.26	0
Total Zone	**158.52**	**1069**	**6.45**	**1756**

Table 46: Category wise production of bio-products

Category	Quantity (Kg/No.)	Value (in lakh)	Farmers (No.)
Bio-fertilizer(q)	158.52	5.38	1056
Bio-Agents(No.)	1069	1.07	700
Total		**6.45**	**1756**

3.1.8.4 Livestock and fisheries

KVKs in Haryana have produced more quantity of livestock and fisheries (384382 numbers) followed by Jammu & Kashmir, Punjab and Himachal Pradesh. Out of the total production of livestock and fisheries more quantity (383528) was under fisheries followed by poultry and dairy **(Table: 47&48)**.

Table 47: State-wise production of livestock materials and fisheries

State	Quantity (No.)	Value (Rs. in lakh)	Farmers (No.)
Punjab	350	0.11	10
Haryana	384382	3.63	59
Himachal Pradesh	79	4.98	57
Jammu &Kashmir	1384	1.26	110
Total	**386195**	**9.99**	**236**

Table 48: Category wise production of Livestock and fisheries

Animal Category	No. of Animals	Value (Rs. in lakh)	Farmers (No.)
Cows	79	4.98	57
Goat	3	0.08	3
Poultry	2466	2.18	153
Piggery	119	2.22	14

Animal Category	No. of Animals	Value (Rs. in lakh)	Farmers (No.)
Fisheries	383528	0.52	9
Total	**386195**	**9.99**	**236**

Varieties of Seed and Planting Material developed by KVKs of Punjab

Wheat varieties (*HD2967, WH 1105, PBW 621and PBW550*)

Paddy varieties (*Pusa Pb Basmati 1509, PR 124, PR121, PR114, PR 122, PR 123 Pusa 1121, PR 111 and PR 118*)

Maize (*J-1006, Navjot and PMH-7)*

Gobhi sarson variety (*GSC-6, GSC-7))*

Sesamum variety (*RT 346*)

Moong of variety (*ML 818 T/L and ML 818 Breeder Seed*)

Cowpea variety (*C-263*)

Cotton variety (*LH 2076, LH 2108 BS, LH 2108 TL and FDK 124*)

Pea variety (*Punjab 89*)

Onion (*Punjab Naroya and PRO-6*)

Guar variety (HG 365)

Napier Bajra (*PBN 233*)

Berseem variety *(BL-42, BL10, BL-1, BL 10 BS, BL 10 TL*)

Tomato variety (GS-600, Indeterminate PAU, Tom – 1, Golden 600)

Brinjal varieties (*Punjab Nagina*)

Lemon varieties of (*Seedless Baramasi)*

Varieties of Seed and Planting Material developed by KVKs of Haryana and Delhi

Wheat variety (*HD-2733, HD-2967, HD 2851, WH-1105and Sahyadri*)

Paddy (*PB-1121, PR-114, IET14444, BPT 343, Pusa Basmati-1121, Pusa-44 and PB-1509)*

Barley variety *(BH-393)*

Guar variety *(HG2-20)*

Mustard variety (*RB-50 & Pusa vijay*)

Raya variety (*RH 30, RH 406*),

Tomato varieties *(P. Rohini)*

Lemon varieties of (*Seedless Baramasi, Kagzi Kalan)*

Varieties of Seed and Planting Material developed by KVKs of Himachal Pradesh

Wheat variety (*HPW-236, HPW349, VL-892, HPW-507, VL 829, HPW 236, HPW 360, HPW 368, HS-240 and HPW 249)*

Paddy variety *(HPR 2612, Kasturi, Pusa Basmati 1509*)

Maize varieties (*African Tall, Early Composite)*

Gobhi sarson variety (*ONK-1)*

Moong variety (IPM-02-3, Suketi)

Cowpea variety (C-475, C-519, Himachal Lobia-1)

Brown Sarson Variety (Neelum)

Oats variety *(Palampur-1)*

Turmeric variety (Palam Lalima)

Chilli variety (Palam Yellow)

Mustard variety (*Neelam)*

Tomato variety (Avtar, 7730, 7711, Yash, Solan Lalima, Rakshita Avtar, Solan Lalima)

Blackgram variety (*Himachal Mash-I, Pant U-19, UG-219, UG 218, Palampur 93)*

Rajmash (*Him-1, Kanchan)*

Pea variety (*Palam Sumool)*

Chinese cabbage variety (*Palampur green)*

Apple seedling varieties (*Red Chief, Royal Delicious, Golden Delicious, Top Red, Oregon Spur)*

Marigold variety (Maxima Orange*)*

Napier Bajra variety (*NB-37)*

Apricot varieties *(Harcoat, New Castle*)

Varieties of Seed and Planting Material developed by KVKs of Jammu & Kashmir

Wheat variety (Sahyadri, PBW 691, *HD-2967, WH 1105, PBW-175, HPW 147, RAJ-3765, HS-490, Vl-829)*

Paddy variety (IET14444, BPT 343, *B-370, Pusa-1121, Jaya, Pusa-1509, SKAU-402, K332, K-39)*

Maize variety (J-1006, SMC-5, *QPM-1, C-6)*

Gobhi Sarson variety (DGS-1)

Brown Sarson variety (*KS-101)*

Moong variety (*ML-818)*

Oats variety (Sabzaar, Kent)

Onion (*Local Red Globe*)

Mustard variety (*RSPR-01)*

Potato variety (*Kufri Badshah*)

Tomato variety (KT 1, S-2, *SH-1, SH-2)*

Blackgram variety (*Him Mash-1, Uttara)*

Knol khol variety (*White Vienna)*

Chilli variety (*Kashmiri long, Pusa Jawala*)

Apple varieties *(Royal Delicious, Golden, Lal Ambri, Firdous Ambri, Mollies Delicious, Red Gold, Red Delicious, Oregon Spur, Gold Spur, Gala Must*)

Apricot varieties *(Khantey, Gilgati*)

Strawberry variety (*Chandler*)

Marigold variety (Pusa Narangi, Pusa basant*)*

3.1.9 Soil, Water and Plant Analysis:

The KVKs in this Zone have tested 28805 samples which include 19641 soil samples, 5125 water samples and 4039 plant samples in 50 soil and water testing laboratories of KVKs. The opportunity of soil and water testing was availed by as many as 22604 farmers from 8726 villages. The number of samples being tested by the KVKs is increasing over the years. This indicates that KVKs have been able to encourage farmers to get soil water and plant samples tested and apply recommended doses of inputs. **(Table 49)**

Table 49: Details of soil, water and plant samples tested

Type of Sample	No. of Samples	No. of farmers	No. of villages	Amount realized (in Rs.)
Soil	19641	15024	5008	425377
Water	5125	4098	2491	63819
Plants	4039	3482	1227	3157
Total	**28805**	**22604**	**8726**	**492353**

In order to maintain the facilities farmers are charged a nominal amount for the services. The KVKs in this process have earned Rs. 4.92 lacs as fees from soil, water and plant testing charges. State wise data showed that KVKs of Punjab have analyzed highest number of samples (11068) from 8163 villages **(Table 50)**

Table 50: State wise soil, water, plant analysis undertaken

State	No. of Samples	No. of farmers	No. of villages	Amount realized (in Rs.)
Punjab	11068	8163	3744	191643
Haryana	10051	8014	3068	21490
Himachal Pradesh	4764	4127	1362	64015
Jammu & Kashmir	2922	2300	552	215205
Total	**28805**	**22604**	**8726**	**492353**

3.1.10 Rainwater Harvesting Units

Rainwater harvesting unit with micro irrigation system was established in 4 KVK i.e Ganderbal, Bilaspur, Hamirpur and Solan. One training course was conducted during 2014-15 utilizing this facility and produced 2.5 lakh planting materials from these rain water harvesting units. Further, 576 farmers and 36 officials visited these units and got acquainted with the rainwater harvesting techniques.

3.1.11 Convergence and Linkages

KVKs work in collaboration with different line departments, organizations of the State and Central Government and well reputed NGOs working on different aspects of agriculture and rural development for sharing experiences and expertise. Such collaborations with line departments will help the KVKs in arranging resources for carrying out different extension activities and developing demonstration and training infrastructure. The organizations having linkage and collaboration with KVKs have been listed in **Table 51**. Besides, many KVKs are working in collaboration with Agricultural Technology Management Agency (ATMA) and National Horticulture Mission (NHM). Under NHM, the KVKs of Gurdaspur and Bathinda provided Gardener's Training Course for six months; KVKs of Punjab provided vocational trainings on bee keeping while KVKs of Himachal Pradesh and Jammu & Kashmir provided trainings on different aspects of protected cultivation, horticulture and off-season cultivation of vegetables.

KVKs have utilized an amount of Rs.0.74 crore under NHM for the benefit of the farming community. KVKs provided training and created awareness among farmers on fish rearing practices in collaboration with fisheries development board in order to encourage fish farming among the water logged areas in south west of Punjab.

Table 51: List of organizations having linkage and collaboration with KVKs

Sl. No.	Organizations/ Departments
1.	Agriculture department
2.	Agriculture Technology Management Agency
3.	Non-government Organizations
4.	State Government Departments (Block Development Office, Department of Horticulture, Department of Public Relations, Department of Animal Husbandry, Dairy Development Board, Department of Soil & Water Conservation, Punjab Energy Development Agency, Punjab State Farmers Commission, Child Development Project Office, Forest Department , Department of Fisheries, Veterinary and Animal Husbandry, Farmers Associations and Group, State Seed Certificate and organic produce Certification Agency, Watershed Department, District collector Office,

Sl. No.	Organizations/ Departments
	Department of Sheep Husbandry, Department of Floriculture, Sericulture Department, Social Justice Association of Ladakh, District Roral Development Agency (DRDA))
5.	State Agricultural Universities
6.	ICAR Institutes (CIPHET, Ludhiana; CPRI, Shimla; DWR, Karnal; NDRI, Karnal; DMR, Solan; DMR, New Delhi, CSSRI, Karnal, Central Research Institute for Dryland Agriculture, Hyderabad; IIHR, Bangalore; IARI, New Delhi; NBPGR; CAZRI, Jodhpur and CITH, Srinagar,)
7.	Central Government Departments and schemes (Central Poultry Development Organization, Central Warehouse Corporation, Integrated Rural Development Programme, Integrated Watershed Development Project, Integrated Watershed Management Programme, KDP- Kargil Development Project, Mahatma Gandhi National Rural Employment Guarantee Act, Rasthtriya Krishi VikasYojna, Indian Farmers Fertilizer Cooperative Limited; National Centre for Integrated Pest Management, National Committee on Plasticulture Application in Horticulture; North India Technical Consultancy Organization, Indian Institute of Integrated Medicine, Defence Research and Development Organization, Indian Army and BSF, National Medicinal Plants Board, NSC- National Seed Corporation and Department of Social Welfare, National Fertilizer Limited, Khadi and Village Industries Commission (KVIC), National Institute for Food Technology Enterprises Management (NIFTEM), Mid Himalayan Watershed Development Project)
8.	Financial Institutes (National Bank for Agriculture and Rural Development (NABARD), State Bank of India and Punjab National Bank)
9.	Other organizations (Punjab State Seed Certification Authority, Cereal Systems Initiative for South Asia and Sir Ratan Tata Trust)
10.	Nehru Yuva Kendra
11.	Training Institutes (State Agricultural Management and Extension Training Institute, Rural Self Employment Training Institute)

Sl. No.	Organizations/ Departments
12.	Mass and Print Media
13.	Private Firms (Mohindra & Mohindra, Dhanuka, India Potash Limited, Bioveta, Mother Dairy, Crystal, Chamba Fertilizer, Adani Agri Logistics Pvt. Ltd)
14.	International Agencies (Japan International Coopration Agency)

1. Department of Agriculture

- Help KVK in identification of participants for trainings, supporting implementation of FLD, OFT, trainings, technology week, farmer's field school, farmers- scientists interactions and interface meeting.
- KVKs involve in joint diagnostic survey, joint field inspection at times of pest and disease outbreaks, contingency crop planning, kharif and rabi campaigns and soil testing campaigns.
- Provide technical back up for implementing RKVY, NHM and ATMA programmes, farm school and organize in-service training to field functionaries.
- Serve as resource persons in the off campus training programmes of the department, workshops and seminars.
- 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

- Database on stakeholders 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 and technology dissemination.
- Establishment of farm machinery for custom hiring, soil and water conservation in KVK farm as well as in farmer's fields in KVK cluster villages.
- Purchase of seeds and planting material of KVKs.
- Trainings & exposure visits on non-conventionalsources of energy.

3. Non-Government Organizations

- Conducting training programme, PRA, technical support, collaboration for conducting training programmes, field days, and seminars and for arranging melas.
- 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, exhibitions, field days, seminars.
- Guidance to students for their Rural Horticultural work experience programme.
- Farm advisory services.
- Participation in mass contact programmes and flower shows.

5. Panchayati Raj Institutions - Village/Gram Panchayat and Zila Parishads

- Support in identifying the farmers and conducting KVK mandatory programmes.
- 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 rural youth.

6. State Agricultural Universities

- KVK gets technical, financial and administrative support in developing infrastructure facilities.
- Help KVKs in selection of latest viable technologies for OFT and FLD, 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.
- 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 Department Ministries and Schemes

- Financial assistance for plant health clinic & seed production unit and infrastructural development 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.

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 innovation fund & fanners technology transfer fund and funding of VVV Clubs formed by KVK.
- Agriculture and rural credit assistance, loan for setting up of agri-enterprises. .

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 organized by KVK and extending loan to KVK beneficiaries.
- Participate as resource person in entrepreneurial development programmes
- 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 Integrated Farming System, cattle rearing, poultry and quail farming utilizing their expertise.
- 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 KVKs 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 and formation of commodity groups.
- Exchange of experts as resource person for training programme

12. Media

- Participating in farm radio programmes, Broadcasting KVK's programmes, announcements, news, answers to questions raised by farmers to the AIR and radio talks.
- Telecasting farmers' field problem solving technologies, technology dissemination & publicity.
- News coverage in newspapers, publication of technical and poplar articles in print media.
- Success stories on KVK activities.
- Participation in rural advisory committee meetings
- Publicity to collaborative activities, arrangements while organizing exhibitions, off campus training programmes, field days and other extension activities.

13. Farmers Associations and Groups

- 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.

15. Agricultural Technology Management Agency

- 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 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 awardees farmers to get them organize farm schools, provide technical expertise during farm school interactions, kisan gosthi etc.
- Participate in ATMA Management Committee and Governing Body meetings.

16. Watershed Department

- Conducting training programmes, joint diagnostic survey, IPS demonstration, seminars and field days.
- Conducting trainings to rural youth on entrepreneurship development programmes.

17. District Collector/ Dy. Commissioner

- Financial support for KVK infrastructure and AV aids
- Participate in monthly review meetings of ATMA, NADP, 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 and executive member - national food security mission committee.

18. Nehru Yuvak Kendras

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

Linkage with Line Departments

3.1.12 Prosperity of farmers through technological interventions

3.1.12.1. Management of bakane disease in paddy in Delhi: Paddy is an important kharif crop in rural Delhi in areas where water quality is good. Basmati varieties of paddy are grown in about 6500 ha area in the state. Since 2008, farmers started cultivating paddy variety Pusa 1121 in place of Pusa Basmati 1 because of better yield, grain quality and price realization. However, this variety is susceptible to bakane disease. By 2010, the KVK scientists observed that the bakane disease incidence in Pusa-1121 variety at farmers' fields was 80%.

Bakane disease in paddy is caused by *Fusarium moniliforme*, a soil borne fungi. It can be effectively prevented in crop by seed treatment with chemical / bio fungicides. The disease cannot be controlled by any chemical in the standing crop. Accordingly, KVK, Delhi organized Front Line Demonstrations (4 each year), training programmes for paddy growers (10 nos.), method demonstrations (5 each year) and about 300 farm advisories through field visits, farmers' visit to KVK, and mobile advisories to tackle the bakane disease problem in paddy in Delhi since year 2010. The farmers were made aware to use good quality seed from reputed producers; and adopt seed, seedling and soil treatment for effective management of bakane disease.

As a result of these efforts of KVK, Delhi in tackling bakane disease problem in paddy crop, about 70% farmers of Delhi have adopted seed / seedling treatment of paddy with chemical / bio fungicide in about 4250 ha area. The occurrence of bakane disease in paddy has reduced from 80% in 2010 to 15% in 2014 with lower intensity and paddy growers (70% farmers who have adopted seed and seedling treatment in raising paddy crop) are harvesting additional grain of 5.03 q/ha.

Activities on bakane disease management organized by KVK Delhi

3.1.12.2. Economic empowerment of farm women through dairy farming in Kullu: Small-scale dairy farming is transforming rural hill economy in general and that in Kullu district in particular. The transformation is more pronounced in areas near to roads as

compared to far flung areas in the district where there is inadequate market access. However, production and productivity per animal is low. Adoption of good management practices like balanced concentrate feeding, availability of green fodder, conservation and enrichment of available fodders, scientific raising of calves, provision of sufficient ventilation and cleanliness in animal sheds, prophylaxis against diseases and parasites can go a long way in improving the productivity of dairy animals.

Realizing the importance of group approach in diffusing the scientific knowledge, KVK, Kullu identified 18 self help groups (SHGs) each comprising of farm women interested in dairy farming during the last three years. After identifying the major problems like scarcity of fodder, low productivity of animals, parasite and disease infestation, etc., training programmes on various facets of scientific dairy farming were conducted and various interventions mostly in the form of observation trials cum demonstrations were planned for the members of these SHGs. The proven technologies viz. making of balanced concentrate ration at house hold level, feeding of mineral mixture, feed supplementation with UMMB, cultivation of green fodder, enrichment of straws and local grasses with urea and molasses, silage making for lean periods, control of parasites and clean milk production which can be easily adopted by the farmers were chosen and put on for demonstrations. Farmer- farmer interactions regarding the results of these technologies demonstrated were conducted in the regular meetings of the groups. These efforts had a catalytic influence on improvement in knowledge and skills of women dairy farmers. Initially reluctant farm women were able to assess the economic benefits of the technologies demonstrated and so the out scaling was accelerated leading to improved health, better reproductive performance and higher yields. The performance indicators like, calf mortality (decreased from 15-20 % before intervention to 5-7 % after intervention), age of puberty (reduced from 24.8 months to 16.42 months), age at first conception (reduced from 26.86 months to 18.28 months), milk yield per lactation (increased from 1500-2000 liters to 2200-3000 liters) and calving interval (rediced from 2.89 years to 1.23 years) showed positive trends leading to increased income of the dairy farm women. One of the SHGs of 25 farm women was facilitated to get loan of Rs. 1.00 lakh to purchase high yielding animals and construction of semi pucca animal sheds under the Dudh Ganga Yojna run by the state Government. This farm women group is currently procuring 800-1000 liters of milk daily from 55 other farmers of the nearby villages and is selling to the

milk cooperative society. The group has procured electronic gadgets to record the quantity and quality (fat percentage, SNF) of milk supplied by the farmers. The farmers get the most reasonable rates of the milk through the society and the payment is done monthly. The milk federation is also supporting the group by supplying quality fodder seeds, concentrate ration at subsidized rate to the women farmers. They are now aware of the market linkages and are able to analyze the market by themselves. They have realized that with their own management skills, they can bring economic changes in their own lives.



A view of dairy farming by a SHG

3.1.12.3. Disease free vegetable nursery raising in Lahaul valley: Raising of early and healthy plant nursery in the Lahaul valley for cultivation of commercial crops of cauliflower, cabbage, tomato and exotic vegetables like lettuce, red cabbage, Chinese cabbage etc. was a challenge to the farmers as the fields remain covered with snow sometimes up to the end of April or even first fortnight of May. The farmers of the valley transport vegetable seedlings from Kullu district after the opening of Rohtang pass to save time and grow early off season vegetables to fetch premium price in the local as well as distant markets. It is observed that some time crops of the farmers fail due to long distance transportation and transplanting shock. This practice may also introduce the inoculums of some soil born diseases in the virgin soils of Lahaul valley. KVK Lahaul & Spiti conducted field demonstrations on raising of healthy nursery for commercial vegetables grown in the valley. The technique of small poly tunnels was introduced and demonstrated to some selected farmers including at the KVK farm. The KVK provided technical knowhow through 31 skill oriented training programmes to 713 farmers during the last 5 years. About 10 farmers of the valley have adopted the technique for raising early and healthy vegetable nursery commercially. These farmers are able to meet about 60-70 per cent demand of nursery of different vegetable crops of the valley. These commercial nursery growers are earning Rs. 102600 to Rs. 560000

depending upon the size of the nursery. On the other hand, the vegetable growers are harvesting bumper crops due to disease free healthy seedlings.

Small poly tunnels vegetable nursery in Lahaul Valley

3.1.12.4. Low cost bottle trap for the management of fruit flies reduced the losses in cucurbits: Cucurbits viz. cucumber, bottle gourd, pumpkin and bitter gourd etc. with an area of 2443 ha with production of 54237 tonnes and subtropical fruits viz. mango, guava, peach and pear etc. with an area of 53990 ha with production of 76126 tonnes are the important cash crops grown in Himachal Pradesh. Tephritid fruit flies (Diptera: Tephritidae) are one of the most diverse group of insects in the country in general and hill state in particular taking heavy toll of these vegetable & fruits causing annual economic losses to the tune of Rs 6,958.20 crore in India. They occupy a predominantly important place in the list of enemies of plants. Among the world's most notorious agricultural pests, both because of their widespread presence and broad larval host range, the enormous direct and indirect damage by the major species of the fruit fly complex, they have a grave effect on agricultural economy.

In Himachal Pradesh, *Bactrocera cucurbitae* (Coquillett) and *Bactrocera tau* (Walker) are the most serious pests on cucurbits. These species were reported as serious pests of cucurbitaceous vegetables and also of solanaceous vegetables in Himachal Pradesh and plains of Punjab. Recently, *Bactrocera scutellaris* (Bezzi) was also reported as pest of many cucurbit crops in Himachal Pradesh. Fruit flies cause huge economic losses to the tune of 35 – 80% in different areas of the state. Due to the peculiar damaging potential, the hidden or concealed maggots emerged out of the eggs laid by females inside the fruit or plant parts mostly escape the insecticides applied for its management. As the existing recommendation fail to target the adults, eggs and the developing maggots, besides high residual toxicity of pesticides, farmers consequently resort to frequent insecticidal applications; which not only

leaves the harmful residues on fruits and vegetables making them unsuitable for human consumption. Also the heavy loads of insecticides applied for their management pollutes our environment apart from many side effects. The effective management of the pest could only be possible through mass trapping of the male fruit flies (male annihilation technique- MAT) followed by need based bait application technique (BAT). Efforts were made by the Department of Entomology, CSK HPKV Palampur and KVK Mandi scientists to develop a trap for field use based on the species diversity in the state, which had been found quite effective under field and on farm trials in reducing the fruit fly damage and enhancing the effectiveness of fruit fly management programme. Owing to its effectiveness, the same has been included in the package of the practices of the University for fruit fly management and there has been a large scale demand for this trap from the farmers. Department of Agriculture, Govt. of Himachal Pradesh has also taken up this technology for large scale demonstration under various schemes during the last two years. The trap is being prepared at Department of Entomology and KVK Mandi for further supply to the farmers or other extension agencies through respective KVKs in the districts.

Adoption of fruit fly traps @ 25 traps per hectare + BAT not only reduced fruit infestation but also reduced fruit fly numbers with passage of time as males are trapped and unmated females either do not lay eggs or lay unfertilized eggs. Installation of fruit fly traps reduced the number of insecticidal applications, consequently minimizing input costs and minimizes environmental pollution. Fruit fly bottle traps are effective for 6-8 weeks and one trap covers an area of around 400 sq. meters and requires no labour for installation.

Installation of fruit fly traps @ 25 traps/ ha along with BAT (jaggery + malathion) application thrice increased fruit yield by 20-30 % in cucurbits while in tomato yield advantage of technology was 16-18%. Installation of fruit fly traps reduced number of insecticidal applications from 6-7 to 3, reducing not only labour costs but also saving time and money. Women are always engaged in farm operations in the region and were exposed to harmful insecticides resulting in many ill effects. As the trap installation has reduced the number of applications, the chances of women health hazards have also reduced. The trap has become very popular among the farmers within a short span of three years and KVK sold around 12000 traps earning revenues to the tune of Rs. 12.0 lakhs. Thus, this technology has now been widely adopted in the district.

Fruit fly damage in cucurbits

Fruit fly bottle trap

3.1.12.5. Coloured strains of apple increased Farmers' profit in Shimla district: Shimla district is situated in temperate zone of Himachal Pradesh and its climate varies from cold zone to temperate and sub- tropical zone depending on the terrain and height of the area. Apple is an important fruit crop covering an area of approximately 36,000 ha with the production of 499422 MT. Production of apple has been declining continuously for the last many years due to cultivation of Delicious cultivars of apple with less proportion of pollinizing cultivars resulting into low spur formation, poor coloration at lower elevation and valley area, and delayed maturity at higher elevation. KVK Shimla, in On Farm Testing, found that coloured / spur strains of apple performed better in the mid and lower area of Shimla district and gave more production of quality fruits. The scientists of KVK trained the farmers in full package of practices of apple cultivation and motivated them to change the varieties with coloured strains/ spur types. The farmers were also supplied the spur type cultivars of apple from KVK as well as university research stations for plantation in a closer spacing in comparison to the Delicious cultivars of apple. In addition to the supply of quality planting material, scientist of the KVK also helped the farmers in laying out and planting of the materials in a scientific way in different parts of the district. In sloppy area, planting was done in the contour system. In the area where terraces were already available, farmers were helped to plant tree in the middle of the terrace at a distance required with the varieties. In the valley area, farmers were advised to do planting in a laying out system like square system, hexagonal system and rectangular system, etc. Farmers were also encouraged to go for high

density planting in area, where the soil were fertile, life saving water was available and flat soil free from high wind velocity. For more horizontal spread of these varieties, KVK Shimla has developed bud wood bank for all spur type and coloured strains. This bud wood bank is helping the farmers in changing their existing varieties through top working as well as by planting new plants. Through exposure visits of farmers in collaboration with State Horticulture Department to KVK farm and location specific training camps, the farmers were advised and motivated to develop their own mother plants of desired varieties.

With the introduction of suitable varieties in the mid and lower area of the district, which were regular in bearing having less chilling requirements, the production of apple increased considerably. Presently more than 25 % area, which comes around 9000 ha, has been shifted to spur type and coloured strains orchard. The average yield of apple in delicious variety, which was around 7 –8 t /ha has now increased to 18- 20 t / ha due to replacement of varieties as per area suitability in different parts of the Shimla district and farmers are getting around Rs. 1100000.00 per ha as net return as compared to around Rs. 500000.00 per ha from delicious varieties.

3.1.12.6. Management of Paddy Blast through Integrated Crop Management: Paddy is a major cereal crop of District Bandipora and is cultivated over an area of 9500 ha. The crop is having an average production of 52 q/ha. More than 16 villages of the District were having the major problem of blast in paddy and were identified as hotspots of paddy blast. The farmers were facing this problem since 2009 and were unable to manage the disease because of use of old varieties, untreated seeds and poor field management. KVK scientists along with officials of Department of Agriculture carried many diagnostic visits to the affected areas during the year 2010 and 2011 for management of disease. Based on analysis of situation and poor response of farmers regarding management of disease, KVK Bandipora laid an OFT in the hotspot blast area (Panzigam) on management of paddy blast during 2011. Seeing the performance of paddy crop in the OFT plot which was free from any symptom of blast and comparing to their own crop in the vicinity of OFT plot, the farmers believed that the disease can be managed in their fields. Based on the results of OFT, farmers approached to KVK Bandipora for demonstrations regarding management of paddy blast. During the year 2012, KVK Bandipora laid FLD on paddy variety Shalimar Rice-1 (SR-1). The performance of the crop remained excellent and farmers of the adjacent villages who were facing disease problems in their paddy fields were made to visit FLD plots which were free from any

disease. Spray of tricyclozole 75WP @ 60g/100L of water at seedling stage followed by foliar spray of hexaconazole 5EC @ 30mL/100L of water at panicle initiation stage helped in managing the disease. Seeing the performance of crop in FLD plots in comparison to their own crop which was affected with paddy blast, farmers decided to adopt the package for management of paddy blast as advocated by the KVK scientists. KVK organized awareness camps, joint diagnostic visits, field visits and interaction meetings with farmers regarding management of disease for diffusing the technology in larger area.

During the year 2013, the farmers of villages which were identified as hotspot areas of paddy blast were provided paddy seed of variety SR-1 by the Department of Agriculture, Bandipora. They followed management practices for managing the disease right from nursery stage and were able to harvest a better crop with an average yield of 58 q/ha. The farmers have adopted blast resistant varieties and are following integrated disease management practices as recommended by KVK and these areas are no more hotspots of paddy blast.

3.1.12.7. Integrated Crop and Nutrient Managemen increased productivity of Brown Sarsoon: District Bandipora is having climate and soil very conducive for cultivation of Brown Sarson. Since paddy is harvested by end of September, farmers usually delay sowing of Brown Sarson because of pre-occupation with harvesting of fruits & other related farming activities. The crop is usually sown during the first fortnight of November resulting in poor crop stand & low yields (7 q/ha) because of poor germination and damage by frost in the initial stage of crop. During the last few years, the area under brown sarson in the district has been decreasing. Poor nutrient management was also the reason for low yield. To overcome the problem, KVK Bandipora laid OFT on "*Effect of Sulphur on quality and quantity of oilseed (Brown Sarsoon)"* during 2011. At the flowering stage of the crop, a visit of farmers and officers of Agriculture Department was arranged to the OFT plot to see the status of the crop. The performance of the plot was quite satisfactory.

During the year 2012, KVK laid demonstrations on Brown Sarsoon over an area of 20ha in the villages of Aloosa, Khayar, Panzigam and Lawaypora. The average yield of demonstration plot was 10.25 q/ha with highest yield of 11q/ha and oil recovery of 41% against a yield of 7 q/ha in the farmers field. The major factors contributing to higher yield were sowing of crop before 10^{th} of October with pre-sowing irrigation, proper ploughing, harrowing and leveling; application of Sulphur @ 20Kg/ha as basal doze. Now area under this crop in District Bandipora has reached up to 1400 ha.

3.1.12.8. Single Cross Hybrids of Maize increased productivity in Rajouri: Yield of maize in district Rajauri was lower than the country/state average. The major reasons identified by the scientists of KVK for the low yield in maize were use of local seeds, low seed replacement rate, and non-adoption of scientific agricultural practices by the farmers. Farmers use produce of preceding year as seed. The seed rate per hectare is very high that ranges between 40 -60 kg/ha. Moreover, they do not treat the seed. The farmers were of the notion that the hybrid variety seeds might not perform in their area/locality. The scientists of KVK Rajouri worked to convince the farmers of the district to use hybrid maize seeds through training programmes for the farmers/farm women, demonstrations on latest maize hybrids and and other extension activities namely field days, kissan gosthies, kissan melas on the farmer's field. In the last five years, KVK organized 14 training programmes to disseminate the technology on scientific cultivation of maize crop to the farmers. In these programmes, training was imparted on different aspects of maize cultivation to 362 farmers/farm women of different villages of district Rajouri. To test new technologies, seven "on farm testing" were also conducted related to crop geometry, integrated nutrient management (INM), weed management, integrated pest management (IPM) to standardize area specific technologies. A total of 242 demonstrations were conducted on maize crop. Besides, seven field days, two ex-trainee samelens, and 12 kisan gosthis on maize crop were organized.

As a result of these activities, use of hybrid seeds increased from1713.25 q covering 8566.25 ha area in 2009 to 3900 q covering 19500 ha area in 2013 which accounts for about 44 percent of the total area under maize in the district. There is significant increase in the productivity of maize in the last five year from 17.0 q/ha in 2009 to 23.52 q/ha in 2013. There was additional production of 340779.06 q in maize crop in the period between 2009 and 2013. On multiplying this additional production with minimum sale price of Rs 1310/q, there was generation of an additional income of Rs.44,64,20,568.60 between 2009 and 2013 by the farmers.

3.1.13 Awards and recognition

3.1.13.1 Best Zonal Krishi Vigyan Kendra Award 2013: Krishi Vigyan Kendra, Patiala has received best Krishi Vigyan Kendra award 2013 Zone-1 for outstanding contribution for developing models of extension education and technology application. The award was presented by Shri Mohan Bhai Kundariya, Union Minister of State, Ministry of Agriculture during Annual Conference of Vice–Chancellors of Agricultural Universities and Directors of ICAR institutes on 15th May, 2015 at NASC complex, Indian Council of Agricultural Research, New Delhi.

Krishi Vigyan Kendra, Patiala has been guiding the farmers of the district for the last 19 years and possesses all the infrastructure facilities required for efficient skill development of the farming community. This KVK is also having a NABARD supported sale outlet **"Rural Mart"** for its Self Help Groups.

3.1.13.2 Other Awards: Krishi Vigyan Kendra, Bathinda received Dr. G S Khush Team Award (2014-15) for Excellence in Technology Transfer on 20th February, 2015. KVK, Bathinda has established commendable linkages for successful transfer of Agricultural Technologies. Popularization of happy seeder/baler cum knotter for wheat cultivation, tensiometer and laser leveler for paddy, green manuring, silage making pits and Gobar gas plant for natural resource management were the significant contributions of KVK, Bathinda. Transfer of technology on "Improvement in production and productivity of cotton in the state" which has brought about revival of the cotton crop was another contribution of KVK. Employment generation through apiculture; animal farming like piggery, goatery, poultry; cultivation of mushroom; value addition of fruits and vegetables; stitching and craft skill for women and gardener training course under National

Horticulture Mission, horticulture supervisors' training course under Rural Development Fund Scheme extended by the KVK have shown significant impact at community level.

3.1.13.3 Progressive Farmers from Zone-I Awarded: **Progressive farmer of KVK Patiala Sh. Gurpreet Shergill**, Village Majhal Khurd, Patiala has been awarded IARI Innovative Farmer Award 2015. The award was presented on the concluding day of PUSA Krishi Vigyan Mela held at IARI, New Delhi from 10–12 March, 2015. Sh. Gurpreet Shergill has received many awards for his innovations in floriculture in poly-net house, vermi-composting and gladiolus bulb grading machine.

Sh. Jaswant Singh a progressive farmer of village Rode Jallewala of district Ferozepur has earned his name by scientific cultivation of flowers. Sh. Jaswant Singh received "**S. Surjit Singh Dhillon**" award from Sh. Tota Singh, Agriculture minister, Punjab at PAU Kisan Mela in September, 2014. He is, an expert in cultivation of marigold and gladiolus, has nursery of different varieties of marigold. He has won many prizes by displaying his flowers in different exhibitions at Kisan melas of PAU and these flowers are chief source of his income. He has contributed in natural resource conservation by adopting drip irrigation and using green manure and farm yard manure in his field. He has additional income from his own small scale dairy and vermicompost unit as well.

Sh. Mohammad Ashan Bhat a farmer from Budgam has earned his name for adopting integrated farming system. In apple crop, he started cultivating vegetable crops like potato, cabbage cauliflower and tomato in order to get immediate returns. He used low cost polyhyouse technology for improved seed production and started preparation of farm yard manure on scientific lines for waste

recycling and its management. Mr. **BHAT** also extended his activities by introducing dairy, sheep rearing and backyard poultry in his farm. He has even planted mulberry trees on the borders of his fields and promoted silkworm rearing**. Mr. Bhat** received the IARI Innovative Farmers Award from Hon'ble Union Minister of State for Agriculture Dr Sanjeev Kumar Balyan during the Valedictory Function of Pusa Krishi Vigyan Mela 2015.

N G Ranga farmer award for diversified agriculture 2013

Smt Krishna Yadav, woman entrepreneur in fruits & vegetables processing received ICAR award **"N G Ranga farmer award for diversified agriculture** for the year 2013. She was awarded for post harvest techniques in value addition of fruit and vegetables. By adopting new package of practices, she is preparing 152 types of products (FPO approved) like pickles, chutneys, murraba, jam, jelly, juice, drinks etc.

Jagjivan Ram Abhinav Kisan Puruskar 2013

Sh. Parma Ram Choudhary of Village Chhattar (Sundernagar) in District Mandi received Jagjivan Ram Abhinav Kisan Puruskar for the year 2013. He is the role model for the famring community in the hilly region owing to low cost innovations and models for marginal farmlands developed through efficient and effective use of limited resources and by following integrated farming system. He practises dairy, agriculture, sericulture, vermicomposting and mushroom production.

3.2 Agricultural Technology Information Centres (ATIC)

Agricultural Technology Information Centres (ATIC) have been established under the National Agricultural Technology Project (NATP) of the ICAR. Farm worthy technologies have been developed in various institutions in the form of knowledge, technologies, seed, planting materials and publications. These will be of use only when they are put in to practice by relevant category of persons. ATIC facilitates in fulfilling these needs. This also helps in providing agri-business and development of entrepreneurship in frontier technology.

ATIC is a single window delivery system for agricultural information as well as products and technologies developed by the Research Institutes with a view to deliver quality services to the clientele. It tries to strengthen the farm advisory services by adopting a multi disciplinary approach to problem solving. It provides a mechanism for feedback from the end users to the research system. ATIC functions as a repository of agricultural information pertaining to farming skills and practices, farm inputs and agricultural education. It offers consultancy services to the different stakeholders in the state and training to unemployed youth to equip them to become job providers, rather than job seekers. Details of activities conducted by ATICs of zone during the year is given in **(Table 52)**

Table 52: Details of activities conducted by ATICs

ATIC	Visits for technical advice	Visits for technology products	Phone calls from farmers	Trainings	Books distributed	Technical bulletins	Soil & water testing samples
PAU, Ludhiana	16,833	1,19,171	6,551	778	48,574	1,73,175	6,512
CCSHAU, Hisar	4,985	1,928	4,951	--	2,427	191	
IARI, New Delhi	1,870	28,250	8,172	--	4,050		180
CPRI, Shimla	380	--	70	1,579	--	1,827	--
NDRI, Karnal	3,899	1,333	2,072	--	1,212	--	--
SKUAST, Srinagar	1,285	--	373	2,185	1,837	716	56
YSPUHF, Solan	2,222	2,222	330	1,019	4,441	--	496
CSKHPKV, Palampur	916	2,694	498	--	4,063	--	--
TOTAL	**32,390**	**1,55,598**	**23,017**	**5,561**	**66,604**	**1,75,909**	**7,244**

Technological services: Out of a total of 187988 farmers who visited these eight ATICs 32,390 visited for technical advice whereas, as much as 1, 55,598 farmers visited to obtain products developed by the host institutes. ATICs have provided trainings to 5,561 farmers who include farmers, students and technocrats. Soil and water testing facilities at ATICs were used for testing of 7,244 soil & water samples. As much as 3,744 farmers were benefited with plant diagnostics services, 47,899 with agro-advisory services and 5,007 were helped through mobile advisory services.

Inputs provided: As much as 66,604 books and 1,75,909 technical bulletins were provided by the ATICs to its end users. A total of 5,462 farmers were benefited with video shows organized by the ATICs. These eight ATICs also provided farm inputs such microbial inoculants, seeds and planting materials, mushroom cultures, bio-pesticides, farm implements, animal feeds materials, etc. The sale of publications such as books, bulletins and CDs have earned Rs. 1, 96, 21,707/- for the ATICs. Similarly, Rs. 2, 02, 88,954/- were earned by them with sale of seeds, planting materials and other products and services.

Information provided: ATICs replied to 294 letters and responded to as many as 23,017 phone calls from farmers asking for technical advices. They provided information using different means such as books, bulletins, pamphlets, CDs, video shows, phone calls, letters, etc. They also provide training on different aspects of agriculture which involve innovative ideas and techniques.

Sale of different services and products have earned them a total revenue of Rs. 3, 99, 10,661/- .

Table 53: Technological products & service sale (Rs.)

ATIC	Publications	Seeds/ Planting material/ other products & services
PAU, Ludhiana	17797230	9593005
CCSHAU, Hisar	16200	810438
IARI, New Delhi	419660	4651388
CPRI, Shimla	112828	0
NDRI, Karnal	113612	2359472
SKUAST, Srinagar	82132	628345
YSPUHF, Solan	553965	877342
CSKHPKV, Palampur	526080	1368964
Total	**1,96,21,707**	**2,02,88,954**

3.3 Technological Backstopping by Directorate of Extension Education:

Directorates of Extension Education of seven State Agricultural/ Veterinary Universities viz., PAU, Ludhiana; GADVASU, Ludhiana; CCSHAU, Hisar; Dr. YSPUH&F, Solan; CSKHPKV, Palampur; SKUAST, Jammu and SKUAST, Srinagar provide technological backstopping in agriculture and allied sectors to the Krishi Vigyan Kendras. Through Scientific Advisory Committee meetings, workshops, review meetings and field visits; the Directors of Extension Education and their officials monitor and coordinate the mandated activities of all KVKs under their jurisdiction. They also organize capacity building programmes for KVK staff on frontier areas of agricultural and allied sectors. Technological products like seeds of improved variety, planting materials, breeds of livestock like poultry and fisheries breeds, etc. are also provided by the Directorates of Extension Education to the KVKs as per requirements.

During year 2014-15, numbers of activities such as HRD programmes, meetings, visits, overseeing, publishing, etc. were organized by the Directorates of Extension Education. As many as twenty two (22) capacity building programmes were organized in the identified areas for KVK staff by these Directorates. They have also organized 32 different workshops and meetings for KVKs.

For technological backstopping on latest technologies in agriculture and allied sectors, Directorates of Extension Education organized trainings and workshops on different topics such as:

- Advances in fruit production
- Advances in vegetable production
- Advances in protected cultivation and plant protection
- Media and public relations
- Basic computer modules
- Formulation and implementation of OFTs and FLDs in Home Science
- Urban agriculture and edible greening
- Extension methodologies for transfer of technologies
- Knowledge management in agriculture
- Knowledge management in livestock extension services
- Orientation to PPVFRA

- Diversification strategies for high value agriculture
- Market led extension
- Significance of research and extension plan in prioritization of need based development plan in agriculture and allied sectors
- Mitigation of aftermath of floods in the context of agriculture
- Sustainable development in agriculture and allied sectors under changing climatic conditions

Table 54: Activities conducted by the Directorates of Extension Education of SAUs

Directorates of Extension Education	SAC meetings Attended	Field Days	Workshops/ Seminars	Technology Weeks	Trainings	OFT Visited	FLD Visited	Technology inventory	
								Published	Updated
PAU, Ludhiana	10	12	7	13	27	12	18	6	6
GADVASU, Ludhiana	0	0	2	0	3	1	1	0	0
YSPUH&F, Solan	3	2	2	0	2	4	6	2	2
CSKHPKV, Palampur	8	12	1	1	1	14	23	3	3
CCSHAU, Hisar	28	17	0	2	50	100	100	3	3
SKUAST, Jammu	6	27	6	4	33	4	11	5	5
SKUAST, Srinagar	12	33	5	5	34	23	32	18	2
Total	**67**	**103**	**23**	**25**	**150**	**158**	**191**	**37**	**21**

Table no…reveals that Directorates of Extension Education of various universities and their officials have participated in 67 Scientific Advisory Committee meetings. Similarly, they have attended 103 Field days, 23 workshops and Seminars, 25 technology weeks, 150 trainings, 158 On Farm Testing (OFT) and 191 Front Line Demonstrations (FLD) programmes organized by various KVKs.

These Directorates of Extension Education were also involved in publishing 37 and updating 21 technological inventories at their universities. They provided various technological inputs to KVKs such as seeds of improved and high yielding varieties, planting materials, medicinal plants for demonstrations, mineral mixture and bypass fat for livestock, services such as analysis of fecal matter, soil and water testing; and earthworms, etc.

Technological inputs:

Directorates of Extension Education provides various technological inputs to KVKs such as seeds of improved and high yielding varieties, planting materials, medicinal plants for

demonstrations, mineral mixture and bypass fat for livestock, services such as analysis of fecal matter, soil and water testing; and earthworms, etc.

During the year, the Directorates provided 136.411 tonnes quality seed material, 287 different improved quality planting materials, 416 bio-products, 3599 poultry breeds, 120 units of UMMB, 240 Kg mineral mixture and 230 Kg bypass fat to the KVKs.

Table.55 Technological inputs provided by the DEEs

Directorates of Extension Education	Seeds (Qtl.)	Planting materials (No.)	Bio-products(No.)	Poultry breed (No.)	UMMB (No.)	Mineral mixture (Kg)	Bypass fat (Kg)	Analysis of fecal samples (No.)
PAU, Ludhiana	1.445	--	--	400	--	--	--	--
GADVASU, Ludhiana	--	--	--	--	120	240	230	72
YSPUH&F, Solan	1.103	--	--	--	--	--	--	--
CSKHPKV, Palampur	0.153	--	--	--	--	--	--	--
CCSHAU, Hisar	54.91	287	410	--	--	--	--	--
SKUAST, Jammu	--	--	--	--	--	--	--	--
SKUAST, Srinagar	78.8	--	6	3199	--	--	--	--
Total	**136.411**	**287**	**416**	**3599**	**120**	**240**	**230**	**72**

3.4 National Innovations in climate Resilient Agriculture (NICRA)

Climate change impacts on agriculture are being witnessed all over the world, but countries like India are more vulnerable in view of the huge population dependent on agriculture, excessive pressure on natural resources and poor coping mechanisms. National Innovations in Climate Resilient Agriculture (NICRA) is a network project of the ICAR launched in February, 2011. The project aims to enhance resilience of Indian agriculture to climate change and climate variability. NICRA is being implemented in the country with three major components namely, Strategic Research, Technology Demonstration, and Capacity building. The Technology Demonstration Component (TDC) of NICRA is being implemented through KVKs of 100 most climatically vulnerable districts across the country with objective to demonstrate the existing technologies with National Agriculture Research and Education System (NARES) to cope up with climate variability on farmers' fields and make the Indian agriculture climate resilient. In Zone-I, 12 most vulnerable districts namely, Bathinda (drought/heat wave), Faridkot (high temperature), Fatehgarh Sahib(Frost/cold wave), Ropar (frost/cold wave), Yamunanagar (Frost in winter), Sirsa (drought/frost), Chamba (Coldwave/drought frost), Hamirpur (drought), Kinnaur (cold wave/drought), Kullu (cold wave), kathua (drought) and Pulwama (Frost/heat wave).

The interventions being implemented are based on four modules, i.e. natural resource management, crop production, livestock and fisheries, and institutional interventions. Besides, capacity building of participating farmers on the tools and new technologies to be adopted to mitigate the climate related adversities in crop production and animal husbandry is also being done. The achievements during the year are detailed as under:-

Module 1: Natural Resource Management (NRM)

This module consists of interventions related to in-situ moisture conservation; water harvesting and recycling for supplemental irrigation; water saving irrigation methods; vermi-composting, alternate energy source urea application based on Leaf Color Chart (LCC) in paddy, Paddy straw management and baler cum-knotter. During the year, 457.4 ha area has been covered under NRM related interventions with 617 farmers in 12 selected villages under NICRA **Table 56**

Table 56: Details of NRM activities implemented under NICRA by KVKs

Intervention	**Technology demonstrated**	**No. of farmers**	**Unit/Area (ha)**
In-situ moisture conservation	Sowing of wheat/summer moong with happy seeder/zero till drill in residual moisture, plastic mulching in cucurbits, laser leveling and fodder grass on farm bunds	411	311.4
Water harvesting and recycling for supplemental irrigation	Water harvesting structures for rain water harvesting, Renovation of farm ponds,	17	34
Water saving irrigation methods	Use of tensiometers for irrigation scheduling in paddy, divisions of fields into smaller plots	61	35.2
Vermi-composting	Use of vermi-composting for soil health improvement	80	40 units
Alternate energy source	Biogas Plant	1	1 unit
Urea application based on LCC in paddy	Use of leaf colour chart for Nitrogen management in paddy	10	10
Any other-Paddy straw management, Baler cum-knotter	Use of paddy stubbles for soil health/fertility	37	66.8
Total		**617**	**457.4 ha, 41 units**

Intercropping of wheat in poplar

Green Manuring

Module II: Crop Production

This module consists of introducing drought tolerant and short duration varieties; water saving paddy cultivation methods; zero tillage in wheat; location specific inter-cropping systems with high sustainable yield index; and disease management practices. During the year, 636 demonstrations were carried out on the aforesaid technologies in an area of 203.05 ha in 12 NICRA villages of the Zone. The per cent increase in yield due to introduction of drought tolerant varieties ranged from 3.51 per cent in Paddy varieties PR-121&122 to 46.51 per cent in 4640 and dekalb double varieties of Maize. The percent increase in yield due to introduction of short duration variety of Black gram-UG-218 & P-93 was 34.23 with BCR of 2.68. Water saving technique in paddy cultivation (DSR) and Zero tillage in Wheat recorded 5.90 per cent and 0.85 per cent less yield, respectively, however saved considerable amount of irrigation water, energy and cost of cultivation. The details are given in **Table 57**.

Table 57: Details of crop production activities implemented under NICRA by KVKs

Technology demonstrated	No. of farmers	Area(ha)	Demo Yield(q/ha)	Check Yield(Q/ha)	Percent increase	Demo BCR	Check BCR
Introduction of drought tolerant varieties							
Wheat (HPW-155)	4	1	21.4	16.5	29.70	1.44	1.31
Soyabean (Harit Soya)	78	4.00	13.20	9.50	38.95	2.23	1.80
Summer Moong (SML-668)	12	4	5.16	4.8	7.50	1.58	1.47
Blackgram (P-93)	62	5	8.1	6.7	20.90	2.84	2.91
Maize (4640,dekalb	78	12.96	63	43	46.51	0.50	2.51

Technology demonstrated	No. of farmers	Area(ha)	Demo Yield(q/ha)	Check Yield(Q/ha)	Percent increase	Demo BCR	Check BCR
double)							
Paddy (PR-121&122)	75	50	73.8	71.3	3.51	2.53	2.44
Total (Drought tolerant varieties)	**309**	**76.96**					
Introduction of short duration varieties							
Black gram-UG-218,P-93	137	10	14.9	11.1	34.23	2.68	2.55
Sub Total of varieties	**446**	**86.96**					
Water saving paddy cultivation methods							
Paddy DSR(Pusa-1121,PR-122)	36	33.05	351.27	373.3	-5.90	**2.88**	**2.67**
Zero tillage in Wheat							
Wheat-PBW-2967	13.00	36.00	46.6	47	-0.85	**2.28**	**2.15**
Location specific inter cropping systems with high sustainable yield index							
Maize (4640)+Soybean (Shivalik)	9	1.04	23.5	21	11.90	**1.72**	**1.87**
Disease Management							
Control of fruit fly in cotton Bio-6588 BG II	132.00	46.00	1118.12	941.29	18.79	**3.15**	**1.77**
Grand Total	**636**	**203.05**					

Nutrient sprays in apple under integrated nutrient management

Plastic mulching in Bottle Gourd

Module III: Livestock and Fisheries

In this module, cultivation of maize and oats for fodder; silage making; hay making; de-worming of animals; mineral mixture supplementation; management of fish ponds/tanks during water scarcity and excess water; animal health check-up and backyard poultry are the activities carried under the project. KVKs under NICRA have covered 1121 dairy animals with de-worming, mineral mixture supplementation and animal health checkup; and 75 poultry birds for backyard poultry production. A total of 184 farmers have been demonstrated silage and hay making for availability of green fodder during lean period. Besides, maize and oat production as fodder was demonstrated in 40.42 ha area of 126 farmers **Table 58**

Table 58: Details of livestock and fisheries activities implemented under NICRA by KVKs.

Intervention	**No. of farmers**	**Units/Area**
Fodder production(Maize J-1006)(ha),Oats-PLP-I)	126	40.42
Silage making(units)	83	83
Hay making (units)	101	101
De-worming of animals(No. of animals)	72	120
Mineral mixture supplementation(No. of animals)	442	607
Animal health check up (No. of animals)	236	394
Management of fish ponds/tanks during water scarcity and excess water	1	0.6 ha (Area of pond)
Backyard poultry (No. of birds)	7	75
Total	**1068**	**41.02 ha, 1121 animals, 184 units,75 birds**

Treatment of Mastitis

Back yard poultry

Module IV: Institutional Interventions

This module consists of institutional interventions related to seed bank, custom hiring centers, community nursery raising and feed enrichment. A total of 3.00 ha area was covered for seed production by 58 farmers. Custom hiring centers established in all 12 villages provided required farm implements to 730 farmers which were utilized in 470.27 ha area to carry out timely operations besides reducing the cost of cultivation. The details are given in **Table 59**.

Table 59: Details of institutional interventions implemented under NICRA by KVKs

Interventions	**No. of farmers**	**Units**
Seed bank(ha)	58	3
Custom hiring centres (ha)	730	470.27
Community nursery raising(ha)	68	1.16
Feed enrichment(q)	52	3.00
Total	**908**	**474.43 ha, 3.00 q**

Capacity Building:-

For capacity building of farmers/farm women training programmes were conducted/organized on different need based aspects for mitigating climate related adversaries in crop production/management/diversification, pest and disease management in crops, nutrition management in crops, resource conservation technology, livestock management, value addition, organic farming , fish farming etc. During the year, 184 capacity building programmes were organized for 4192 farmers including 820 farm women in all the 12 NICRA villages under Zone-I. The details are given in **Table 60**.

Table 60: Details of capacity building programmes carried out under NICRA by KVKs

Thematic area	**No. of courses**	**No. of farmers**		
		Male	Females	Total
Crop production/management/crop diversification	21	427	72	499
Resource conservation Technology	35	682	30	712
Farm implements and Machinery	7	86	24	110
Live stock management	11	190	89	279
Pest and Disease Management	34	587	78	665
Horticultural Crops	21	292	226	518
value addition	7	77	112	189
Nutrition Management	25	656	24	680

Thematic area	No. of courses	No. of farmers		
		Male	Females	Total
Fodder & Feed management	11	199	58	257
Weed Control	2	100		100
Vermi-composting	1	10		10
Organic farming	1	13		13
Fish farming	2	14	0	14
Home science	1	0	27	27
Value addition	4	15	80	95
Human nutrition and child care	1	24		24
Total	**184**	**3372**	**820**	**4192**

Extension Activities:-

In order to create mass awareness about the impact of the climate resilient technologies, large numbers of extension activities were organized by KVKs under NICRA at the KVK farms and in the NICRA villages. In all 854 extension programmes were organized in which 13657 farmers including 3328 farmwomen participated and benefitted. The details are presented in **Table 61.**

Table 61: Details of Extension Activities carried out under NICRA by KVKs

Name of the activities	Number of programmes	No. of beneficiaries		
		Male	**Female**	**Total**
Method Demonstration	98	1767	372	2139
Field day	21	978	91	1069
Awareness Programme	23	630	118	748
Exposure visit	11	266	34	300
Group Discussion	161	2021	818	2839
Agro-Advisory	282	2275	873	3148
Awareness campaign	97	846	764	1610
Celebration of Environment day	1	40	20	60
Diagnostic visit	13	63	92	155
Field visit	136	1025	61	1086
Kisan Ghosti	11	418	85	503
Total	**854**	**10329**	**3328**	**13657**

3.5 National Initiative on Fodder Technology Demonstration (NIFTD)

In India, agriculture and livestock are inseparable parts of rural livelihood. Rearing livestock not only engages a significant rural population but also ensures sizeable income for them. Moreover, it acts as insurance for the farmers in the event of sub-normal/ scarcity years when crop production witnesses drastic reduction both in areas and productivity. A close look at the livestock population indicates that India accounts for 15% of the total of the world livestock population which is dependent on 2% of geographical area. At present India is facing a net deficit of 35.6% in green fodder, 10.95% in dry crop residue and 44% in concentrate feed ingredients. The demand for green fodder and dry forage is expected to reach to 1012 and 631 million tons, respectively, by the year 2050. Hence, to meet the current level of livestock production and its annual growth in population, well through strategies are needed to meet this demand either by increasing productivity, utilizing untapped feed resources or increasing land area. However, expansion of land area under fodder cultivation may not be a viable option owing to human pressure for bringing more areas under food crops.

In India, there is regional and seasonal disparity in fodder production and its availability. Lack of sufficient post harvest and storage facility often prevents proper utilization of surplus fodder. Diversion of fodder from surplus to deficit areas is also not a common practice. Diversion of edible crop residues to non-agriculture use is also a matter of concern towards making crop residue staple feed of livestock. In our country, out of 55 micro regions, 43 are deficient in fodder availability. In spite of the importance and contribution of forage production in livestock sector, systematic efforts have hardly been made to strengthen the area of fodder and forage production. There is considerable lack of awareness about fodder production, utilization and marketing among the farmers as well as extension workers. The allocation of fund for fodder development is also very less against the total fund allocation for the animal husbandry sector. Linkage among various organization related to fodder is also missing in some way or the other. A holistic view point is needed to bring the entire process of fodder and forage production under a well organized production and utilization system. Keeping in view the need to increase production as well as to reduce the demand supply gap, a flagship programme has been conceptualized by Indian Council of Agricultural Research with Indian Grassland and Fodder Research Institute across the country with the following objectives.

i. Accelerating production of fodder through promotion of comprehensive fodder production, conservation and utilization in mission mode for enhancing the availability of fodder throughout the year.

ii. Developing seed and planting material bank of forage for catering the requirements of their vicinity.

iii. Establishment of backward and forward linkages with different stake holders for profitable forage based livestock husbandry.

iv. Promotion of opportunities in commercial venture of fodder production and utilization.

Considering the importance of enhancing fodder production, initially 100 KVK districts were identified. In the process IGFRI, Jhansi was assigned the responsibility to provide technology module, basic seed and planting materials and capacity building of KVK staff to make them knowledgeable and skillful in carrying out the programme in Mission Mode. To give the programme a workable platform, 90 KVKs across the nation were finally trained at IGFRI, Jhansi, MPKV, Rahuri and farmers' Training Center, BCKV, Kalyani, Nadia. Technology module for all the 90 KVKs was developed. Ten KVKs from ICAR-ZPD, Zone-I were selected for implementation of this project. But only eight KVKs conducted demonstrations in fodder at farmer's field and at KVK farm during Kharif 2014.

Table 62: KVKs under NIFTD Programme of Zone-I

SI. No.	State	KVKs under NIFTD Programme
1	Punjab	Tarntaran
2	Haryana	Rewari
3	Himachal Pradesh	Bilaspur Chamba Kangra, Kullu , Mandi, Hamirpur and Lahaul & Spiti
4	Jammu & Kashmir	Kargil

Table 63: NIFTD Programme conducted by KVKs during Kharif, 2014-15

SI. No.	Name of the KVK	Name of crop	No. of demonstrations	Area (ha)	No. of farmers
1	**Rewari**	Guinea grass	4	0.40	3
		Cenchrus Grass	8	0.25	8
		S. Hamata	5	0.20	5
		Total	**17**	**0.85**	**16**
2	**Kullu**	Guinea grass	4	0.16	4
		Cow pea	4	0.32	4

SI. No.	Name of the KVK	Name of crop	No. of demonstrations	Area (ha)	No. of farmers
		Total	**8**	**0.48**	**8**
3	**Mandi**	Guinea grass	5	0.4	5
		Setaria	3	0.05	3
		Total	**8**	**0.45**	**8**
4	**Taran Taran**	Maize J 1006	2	0.2	2
		Sorhgum (MP chari)	2	0.2	2
		Silage	10	0.045	-
		Total	**14**	**0.45**	**4**
5	**Hamirpur**	Azolla	40	0.04	40
		Silage production from fodder Maize + Sorghum + Pearl Millet	12	--	12
		Total	**52**	**0.04**	**52**
6	**Chamba**	Guinea Grass (BG-2)	10	1.9	10
7	**Bilaspur**	Guinea grass	8	1.0	8
8	**Kangra**	Guinea (BG-2)	2	0.08	2
	Grand Total		**119**	**5.25**	**108**

Table 64: Seed/slip production by KVKs at KVK Farm during Kharif 2014-15

Sl. No.	Name of the KVK	Name of the crop	Area (ha)	Av. Seed/ Slip Yield (q/ha/No.)
1.	Chamba	Guinea Grass (BG-2)	1.00	0.06
2.	Hamirpur	NBH 37, Guinea Grass (PGG9) and Azolla	0.31	1200000 slips & 80 q
3.	Kangra	Napier Hybrid Bajra (NB-37)	3.00	1000000 slips
4.	Mandi	Guinea Grass	0.04	
	Total		**4.35**	

3.6. Protection of Plant Varieties & Farmers' Right

In view of providing the way for establishment of an effective system for the protection of plant varieties, the right of farmers and plant breeders and to encourage the development of new varieties of plants, Govt. of India enacted "The Protection of Plant Varieties and Farmers' Right (PPV & FR) Act, 2001' to recognize and to protect the rights of the farmers in conversing, improving and making varieties. Indian legislation is not only in conformity with the International Union for the Protection of New Varieties of Plants (UPOV), 1978, but also have sufficient provisions to protect the interests of public/ private sector breeding institutions and the farmers. The legislation recognizes the contributions of both commercial plant breeders and farmers in plant breeding activity and also provides to implements TRIPs in way that supports the specific socio-economic interests of all the stakeholders including private, public sectors and research institutions, as well as resource constrained farmers.

To implement the provisions of the Act, the Department of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India established Protection of Plants Varieties & Farmers' Right Authority (PPV & FRA) on 11th November, 2005. The PPV & FRA, in turn, took up large-scale awareness-cum-training programmes for the farmers through State Agriculture Universities, ICAR Institutes and other research and development organizations. In extending helping hands to PPV&FRA, ICAR- Zonal Project Directorate, Zone-I provided its support to involve the existing network of KVKs to enable the PPV & FRA to achieve its set objectives of establishing an effective system for the protection of plants varieties, the rights of farmers and plant breeders and to encourage the development of new varieties of plants; recognizing and protecting the right of the farmers in respect of their contributions made in any time in conserving, improving and making available plant genetic resources for the development of new plant varieties; accelerating agricultural development in the country, protecting plant breeders' rights, stimulating investment for research and development of new plant varieties and facilitating the growth of seed industry in the country, which will ensure the availability of high quality seeds and planting materials to the farmers.

As a collaboration approach, Zonal Project Directorate identified 25 KVKs from the state of Punjab, Haryana, Himachal Pradesh and Jammu & Kashmir for creating awareness among the farmers of the concerned districts. The districts were selected based on the availability of food grains, number of near-extinct plant varieties and combinations of

farmers towards development of new plant varieties, which can be patented. To give the programme a concrete shape as well be to evolve an effective plan of action, a training -cum-awareness programme was organized for the subject matter specialists of KVK in this zone on 26th August 2014 at SKUAST Srinagar & on 31st March 2015 at KVK Gurgaon. Besides, these KVKs of Zone-I organized various training programmes for farmers in their districts given in **Table 65.**

Table 65: Trainings programme conducted by the KVKs of Zone-I under PPVFRA 2014-15

SI. No.	Name of the KVK	No. of Trainings	Date of Trainings	No. of Participants
1.	KVK, Hoshiarpur	1	03/12/2014	50
2.	KVK, Gurdaspur	1	28/01/2015	50
3.	KVK Ropar	2	3/12/2014 &05/03/2015	100
4.	KVK Kullu	1	30/03/2015	50
5.	KVK Mandi	1	19/04/2015	273
6.	KVK Hamirpur	4	07/02/2015, 10/02/2015, 16/02/2015 & 25/03/2015	200
7.	KVK Sirmour	1	30/03/2015	100
8.	KVK Bilaspur	1	14/03/2015	100
9.	KVK Chamba	2	18/04/2015 & 27/04/2015	150
10.	KVK Shimla	2	13/10/2014, 15/10/2014 & 30/03/2015	150
11.	KVK Kinnaur	4	20/03/2015, 21/03/2015, 23/03/2015 & 26/03/2015	200
12.	KVK Solan	4	02/03/2015, 17/03/2015, 04/03/2015 &16/03/2015	200
13.	KVK Jammu	1	27/02/2015	50
14.	KVK Poonch	1	29/01/2015	100
15.	KVK Kathua	2	24/02/2015 & 07/02/2015	200
16.	KVK Leh	2	15/01/2015 & 16/01/2015	200
17.	KVK Pulwama	1	31/12/2014	50
18.	KVK Gandarbal	1	25/02/2015	50
19.	KVK Bandipora	1	09/09/2014	50
20.	KVK Srinagar	3	12/01/2015, 13/03/2015 & 20/03/2015	150
21.	KVK Kargil	1	03/01/2015	142
22.	KVK Kupwara	2	01/01/2015 & 13/01/2015	100
23.	KVK Kulgam	2	25/02/2015 & 17/03/2015	100
24.	KVK Shopian	2	14/03/2015 & 19/03/2015	100
25.	KVK Anantnag	2	11/11/2014 & 27/11/2014	130
26.	Zonal Project Directorate, Zone-I, Ludhiana	2	SKUAST Srinagar (26/08/2014) and KVK Gurgaon (31/03/2015)	100
	Grand Total	**47**		**3145**

Chapter 4

HUMAN RESOURCE DEVELOPMENT

Human Resources are the greatest asset of every nation. Therefore, Human Resource Development (HRD) is a relatively modern management term used to describe the individuals who make up the trained manpower of an organization. Hence, it is important to implement HRD programmes to keep employees abreast with the latest technological development, acquiring specific technical knowledge and skill and update in their subject matter as to make them efficient to carry their assignments in the organization as well as for their career development. Hence, employees and staff are conscious of the importance of HRD. In this direction, this Directorate has taken many capacity building programmes for the benefit of KVK staff and the details are presented in **table 66.**

The upliftment of the farmers can be achieved through specialized training of the staff of KVKs in upcoming latest agriculture knowledge. KVK staff has also participated in HRD activities conducted by other institutions through their respective host organizations. During the year, 2014-15, 97 KVK staff attended different training courses of different duration viz., short, medium and long duration as a part of HRD programme organized by NARES in the country on the thematic areas viz., soyabean processing, soil & water conservation, technology management, mushroom production, writing for print and electronic media, entrepreneurship development in fisheries, bio-fortification of food crops, community radio, futuristic agricultural extension, approaches and tools, agribusiness management, off season production of commercial vegetables and dairy farming. **Table 67**

Table 66: Details of HRD programmes organized by ICAR-Zonal Project Directorate, Zone-I

Organizing Agency	Title of the training programmes	Duration of Programme	No. of Participants	No. of KVKs involved
ICAR-ZPD	Workshop on finalization of **"On-farm trials and frontline demonstrations"** for Home Scientists of KVKs of Punjab at PAU, Ludhiana	10th April, 2014	25	15
	Workshop on finalization of **"On-farm trials and frontline demonstrations"** for Animal Scientists of KVKs of Punjab at PAU, Ludhiana	11th April, 2014	20	10
	Awareness cum training programme about **Protection of Plant Varieties and Farmer's Right Act-2001**, of farmers and breeders who are engaged in preserving or developing new plant varieties	26th August, 2014 31st March, 2015	100	25
	Total		**145**	**50**

Training programme on PPV&FRA

Table 67: Details of HRD programmes organized by SAUs, ICAR Institutes, CII and State government organizations for the KVK staff

Organizing Agency	Title of the training programmes	Duration of Programme	No. of Participants	No. of KVKs involved
ICAR-CIAE, Nabi Bagh, Berasia Road, Bhopal	Training Programme on "**Soyabean Processing**" at Agro Produce Processing Division,	26-30th May, 2014 4-8th August, 2014	11	11
ICAR-CSWCRTI, Regional Research Centre, Chandigarh	Training Programme "**Soil and Water Conservation"**	23-31st May, 2014	24	24
NAARM, Rajenderanagar, Hyderabad	Sensitization programme of KVK Professionals on Technology Management in Agriculture under BPD-NAARM	9-11th June, 2014	5	5
ICAR-Directorate of Mushroom Research, Solan	Training Programme on "**Mushroom Production Technology"**	18-24th July, 2014	6	6
National Institute of Agricultural Extension Management (MANAGE)	Training Programme on **"Writing for Print and Electronic Media**"	21-25th July, 2014	8	8
Fisheries Research and Information Centre (Inland), Hebbal, Bengaluru	Training Programme on "**Empowerment of fish farmers and entrepreneurship development**"	4-23rd August, 2014	8	8
ICAR-Indian Institute of Pulses Research, Kanpur	Short course on **"Biofortification of Food Crops"**	4-13th ,August, 2014	7	7
CCSHAU, Hisar	Workshop on "**Community Radio"** for Agricultural Development	4-8th August, 2014	6	6
ICAR-IARI, New Delhi	Craft training on " "Futuristic Agricultural Extension Approaches" and Tools"	3-23rd September, 2014	6	6
Central Agricultural University, Umiam (Barapani), Meghalaya	Training course on "**Agri-business management in reference to Hills"**: Problems and Prospects	15-24th September, 2014	2	2
Dr. YSPUH&F, Solan	Training programme on **"Recent developments in off-season production of commercial vegetables**", 2014	9-29th September, 2014	8	8

Organizing Agency	Title of the training programmes	Duration of Programme	No. of Participants	No. of KVKs involved
ICAR-NDRI, Karnal	Training programme on "**Good Dairy farming Practices : A way forward for organic farming** at	29th October -5th November, 2014	6	6
	Total		**97**	

Chapter 5

PUBLICATIONS

5.1 Publications by Staff of Zonal Project Directorate

Staff of Zonal Project Directorate has been involved in documentation of various activities. Publications brought out during the year are listed below.

Research Articles:

- Sharma Manoj, Gurdeep Singh and Keshava. 2014. Feeding of UMMB Licks to Dairy Animals: A Farmers' Reactive Study. Journal of Krishi Vigyan, Vol-2, Number-2, pp 39-43.
- Mamgai. Preeti & Singh, J.P. (2014) Resource and use pattern of bio-fuels by rural women of Bikaner district in Rajasthan. Journal of Community Mobilizationand Sustainable Development. Vol. 9 (2), 186-191.

Reports:

- Keshava, Ajmer Singh, Preeti Mamgai, Devinder Tiwari, Pankaj Sood, D S Yadav, Ajaib Singh, D. C. Sati, Indu Bagal and Permod Sharma. 2014. Annual Report 2013-14. ICAR-Zonal Project Directorate, Zone-I, PAU Campus, Ludhiana, P. 77

5.2 Publications by KVKs:

KVK Staff documented and published 266 research papers, 2875 technical reports, 27 technical bulletins, 427 popular articles, 12 training manual, 227 extension literature/leaflets/folders, 18 books/book chapters and 25 electronic media in the form of CD/DVD on various technological aspects of enterprises of agriculture and allied sectors during the year 2014-15.

Chapter 6

WORKSHOPS, MEETINGS, CONFERENCES

The Zonal Project Director, scientists and officials of ICAR-Zonal Project Directorate have organized and actively involved in organization of various workshops, meetings and conferences. These are listed below:-

6.1 Organization of Meeting/Workshops

- Annual Action Plan Meeting of NICRA KVKs at UAS, Bangalore during 12 May 2014.
- 86th ICAR Foundation Day at DEE, PAU, Ludhiana on 16 July 2014.

6.2 Participation in Meetings/Workshops/Conferences/Seminars

- Midterm Review Meeting of RCM 5 of ICAR at CSSRI, Karnal on 23.04.2014.
- Scientist-farmer interaction meeting at KVK, Patiala on 5th April, 2014
- State Level Action Planning Workshop of KVKs of Haryana and Delhi at CCSHAU, Hisar on 24-25 April, 2014.
- Review-cum-Action Planning Meeting of KVKs of Zone-I under NICRA at UAS, Hebbal, Bengaluru on 12.05.2014.
- KVK Interface Workshop at NASC, New Delhi on 19-20 August, 2014.
- Interface meeting of NICRA-NSMA in the Conference Hall of NRM Division, KAB-II, Pusa New Delhi on 13 October, 2014.
- ICAR Institutes-SAUs-Development Departments & Stakeholders Interface at ICAR-NDRI, Karnal on 18 October, 2014.
- Brainstorming Workshop on Evolving a Framework for CRA at ICAR-CRIDA, Hyderabad on 29 November, 2014.
- Capacity Building Programme on Technology Demonstrations for Climate Resilience and Value-added Agro-met Advisories on 19-20 January, 2015 at CRIDA Hyderabad.
- Inter session meeting of the consultative committee of Ministry of Agriculture on Frontline Extension in Agriculture held on 17.02.2015 at KVK, Gurgaon.

PPV&FRA meeting conducted at KVK, Gurgaon 31.03.2015

Scientist-farmer interaction meeting at KVK, Patiala on 5th April, 2014

Inter session meeting of the consultative committee of Ministry of Agriculture on Frontline Extension in Agriculture held on 17.02.2015 at KVK, Gurgaon

Scientist-farmer interaction meeting at KVK, Patiala on 5th April, 2014

Chapter 7

PERSONNEL

Existing staff position of the ICAR-Zonal Project Directorate-Zone 1, Ludhiana as on March 31, 2015 is presented below:

7.1 Staff in Position

Research Management	Dr. Rajbir Singh	Zonal Project Director
Scientific	Dr. Keshava	Principal Scientist (AE)
	Dr. Preeti Mamgai	Senior Scientist (HM)
Technical	Sh. Harbhajan Singh	Sr. Tech. (Driver)
Administrative	Sh. D.C.Sati	AF&AO
	Mrs. Manjit Kaur	Assistant
	Ms. Indu Bagal	Assistant
	Sh. Raj Kumar	LDC
	Sh. Deepak Sharma	LDC

7.2 Superannuation / Joining / Promotion

- Dr. S. Prabhu Kumar, Retd. Acting Zonal Project Director, superannuated as on 28.02.2015.
- Dr. Ajmer Singh, Sr. Scientist (Agri. Eco) has been transferred as on 03.01.2015 to ICAR-NDRI, Karnal.
- Sh. Permod Sharma, UDC has been selected as JAO as on 07.11.2014 at ICAR-ZPD, Zone-VI, Jodhpur.

List of KVKs

Annexure-I

Sr. No.	District	Year of Sanction	Location	Telephone Number
Punjab				
1	Amritsar	August, 2004	Programme Coordinator, Krishi Vigyan Kendra, Usman, Distt Amritsar-143001	0183-2505672
2	Bathinda	March, 1992	Programme Coordinator, KVK, Dabwali Road, Near Kheti Bhawan, Bathinda -151 001	0164-2215619
3	Faridkot	April, 1995	Programme Coordinator, Krishi Vigyan Kendra, PAU Regional Research Station, Faridkot-151 203	01639-253142
4	Fatehgarh Sahib	August, 2004	Programme Coordinator, Krishi Vigyan Kendra, Shamsher Nagar, Sirhind, Distt. Fatehgarh Sahib	01763-221217
5	Ferozepur	July, 1990	Programme Coordinator, Krishi Vigyan Kendra, Malwal Road, Ferozepur – 152 001	01632-246517
6	Gurdaspur	August, 1982	Programme Coordinator, Krishi Vigyan Kendra, PAU Regional Research Station, Gurdaspur – 143 521	01874-220743
7	Hoshiarpur	June, 1990	Programme Coordinator, Krishi Vigyan Kendra, VPO Bahowal, Hoshiarpur–146105	01884-243647
8	Jalandhar	March, 2006	Programme Coordinator, Krishi Vigyan Kendra, Opposite-DIPS School, Nakodar Road, Nurmahal, Jalandhar-144039	01826-292053
9	Kapurthala	June, 1990	Programme Coordinator, Krishi Vigyan Kendra, J.J. Farm, Near New Grain Market, PO: Sheikhupur, Kapurthala – 144620	01822-233056
10	Ludhiana	August, 2004	Programme Coordinator, Krishi Vigyan Kendra, Samrala,Distt.Ludhiana-141114	01628-261597
11	Moga	February, 2005	Programme Coordinator Krishi Vigyan Kendra, Room No.219, Chanab Complex, Mini Sectariat, Distt Moga	01636-235495
12	Muktsar	August, 2004	Programme Coordinator Krishi Vigyan Kendra, Goneana, Distt Muktsar-152 026	98556-20914 (M)
13	Nawanshahar	February, 1995	Programme Coordinator, Krishi Vigyan Kendra, VPO: Langroya, Distt. Nawanshahar-144 516	01823-250652
14	Patiala	1991-92	Programme Coordinator,	0175-2225473

Sr. No.	District	Year of Sanction	Location	Telephone Number
			Krishi Vigyan Kendra, Post Box No. 22, Patiala – 147 001	
15	Ropar	May, 2004	Programme Coordinator, Krishi Vigyan Kendra, PAU Regional Research Station, Haveli Kalan, Ropar – 140 001	01881-220460
16	Sangrur	March, 1995	Programme Coordinator, Krishi Vigyan Kendra, Kheri, Sangrur – 148 001	01672-245320
17	Mansa	May, 2006	Programme Coordinator, Krishi Vigyan Kendra, Mansa	01652-235590
18	Barnala	February, 2012	Programme Coordinator, Krishi Vigyan Kendra, Village & P.O. Handiaya, Barnala- 148107	08196080643 (M)
19	Mohali	December, 2011	Programme Coordinator, Krishi Vigyan Kendra, Village Majra, P.O. Sayabe Majri, Sahibzada Ajit Singh Nagar, Mohali	-
20	Tarantaran	December, 2011	Programme Coordinator, Krishi Vigyan Kendra, Booh, P.O. Harike, Tarantaran-143412	09463104958 (M)
Haryana and Delhi				
21	Ambala	June, 1995	Programme Coordinator, Krishi Vigyan Kendra, Vill. Tepla, P. O. Saha, Distt. Ambala – 133 104	0171-2822522
22	Bhiwani	July, 2004	Programme Coordinator Krishi Vigyan Kendra, Near Bhim Stadium, Bhiwani-127 021	01664-242633
23	Faridabad	April, 1992	Programme Coordinator, Krishi Vigyan Kendra, Vill. Bhopani, P.O. Bhaskola, Jasana Road, Distt. Faridabad –121002	0129-2202332
24	Fatehabad	July, 2004	Programme Coordinator Krishi Vigyan Kendra, Govt. Seed Farm, Distt. Fatehabad-125 050	01667-226299
25	Gurgaon	June, 1983	Programme Coordinator, Krishi Vigyan Kendra, IARI, Shikohpur, Gurgaon – 122 001	0124-2019067 2019068
26	Hisar	May, 1989	Programme Coordinator, Krishi Vigyan Kendra, Mandi Adampur, Vill.Sadalpur, Hisar – 125 052	01669-244931
27	Jhajjar	July, 2004	Programme Coordinator Krishi Vigyan Kendra, Beed Sunarwala, 5Km-Stone, Jajjar-Badli Road, Distt Jhajjar-124 103	01251-217915

Sr. No.	District	Year of Sanction	Location	Telephone Number
28	Jind	March, 1992	Programme Coordinator, Krishi Vigyan Kendra, Vill. Pandu Pindara, Jind-126102	01681-245940
29	Kaithal	January, 1993	Programme Coordinator, Krishi Vigyan Kendra, New Peoda Road, P.B. No. 40, Kaithal – 136 027	01746-223320
30	Karnal	July, 1976	Programme Coordinator, Krishi Vigyan Kendra, NDRI, Karnal – 132 001	0184-2259338 2259341
31	Kurukshetra	August, 1992	Programme Coordinator, Krishi Vigyan Kendra, 430/13, Urban Estate, Near Railway Station, Kurukshetra – 136 118	01744-220418 227254
32	Mohindergarh	March, 2002	Programme Coordinator Krishi Vigyan Kendra, Mohindergarh – 123 029	01285-220293
33	Panipat	October, 1994	Programme Coordinator, Krishi Vigyan Kendra, Vill. Ujha, P.O. Risalu, Panipat–132104	0180-2001625
34	Rewari	July, 1983	Programme Coordinator, Krishi Vigyan Kendra, Shri B.B. Ashram, Rampura, Rewari – 123 401	01274-222475
35	Rohtak	June, 2002	Programme Coordinator, Krishi Vigyan Kendra, Near Jat College, Rohtak – 124 001	01262-274257
36	Sirsa	March, 2002	Programme Coordinator, Krishi Vigyan Kendra, Tehsil Road, Sirsa – 125 055	01666-221147
37	Sonipat	April, 1992	Programme Coordinator, Krishi Vigyan Kendra, Village-Jagdishpur, Narela Road, Sonipat – 132 001	0130-2325274
38	Yamunanagar	March, 1992	Programme Coordinator, Krishi Vigyan Kendra, Damla, Yamunanagar – 135001	01732-282737
39	Delhi	February, 1995	Programme Coordinator, Krishi Vigyan Kendra, Ujwa, New Delhi-110 073	011-28015272
Himachal Pradesh				
40	Bilaspur	February, 2004	Programme Coordinator, Krishi Vigyan Kendra, CSKHPKV, Research Sub Station, Berthin, Bilaspur – 174 029	01978-267194
41	Chamba	March, 1991	Programme Coordinator, Krishi Vigyan Kendra, P.O. Saru, Distt. Chamba–176 310	01899-232144

Sr. No.	District	Year of Sanction	Location	Telephone Number
42	Hamirpur	October, 1988	Programme Coordinator, Krishi Vigyan Kendra, CSKHPKV, Hamirpur at Bara, Distt. Hamirpur– 177 044	01972-238130 238870
43	Kangra	January, 2000	Programme Coordinator, Krishi Vigyan Kendra, Kangra, Distt. Kangra – 176001	01892-264550
44	Kinnaur	March, 1995	Programme Coordinator, Krishi Vigyan Kendra, Kinnaur at Reckong Peo, Kinnaur – 172 107	01786-222122
45	Kullu	February, 1985	Programme Coordinator, Krishi Vigyan Kendra, CSKHPKV, Bajaura, Distt. Kullu – 175 125	01905-287318
46	Lahaul & Spiti	February, 2004	Programme Coordinator, Krishi Vigyan Kendra CSKHPKV Regional Research Station, Kukumseri–175142 (Lahaul & Spiti)	01909-222666
47	Mandi	October, 1994	Programme Coordinator, Krishi Vigyan Kendra, Sundernagar–174402, Distt. Mandi	01907-262547
48	Shimla	February, 1995	Programme Coordinator, Krishi Vigyan Kendra, Near Petrol Pump, Rohru, Distt. Shimla - 171 207	01781-240365
49	Sirmaur	January, 1983	Programme Coordinator, Krishi Vigyan Kendra, Regional Research Station, Dhaulakuan, Distt. Sirmaur – 173 001	01704-257462
50	Solan	February, 2004	Programme Coordinator, Krishi Vigyan Kendra, YSPUH&F, P.O.& Teh. Kandaghat, Distt. Solan – 173 215	01792-256232
51	Una	October, 1994	Programme Coordinator, Krishi Vigyan Kendra, Rampur, Una – 174 303	01975-225003
Jammu & Kahmir				
52	Bandipora	May, 2005	Programme Coordinator Krishi Vigyan Kendra, Potushai, Bandipora, Baramulla-193 502	0194-225013
53	Srinagar	July, 2002	Programme Coordinator, Krishi Vigyan Kendra, Srinagar, SKUAST-K, Old Airport, P.B. No. 823, GPO Srinagar-191 111 (J&K) (Erstwhile Budgam)	01951-212234
54	Doda	December, 2002	Programme Coordinator, Krishi Vigyan Kendra, SKUAST, Gwari, Bhaderwah,	09419107726 (M)

Sr. No.	District	Year of Sanction	Location	Telephone Number
			Distt. Doda – 182 221 (J&K)	
55	Jammu	June, 1992	Programme Coordinator, Krishi Vigyan Kendra, SKUAST, R.S. Pura, Jammu – 181 102	01923-250788
56	Kargil	February, 2004	Programme Coordinator, Krishi Vigyan Kendra, SKUAST(K), Kargil–194 103	01985-233585
57	Kathua	January, 2008 (re-opened)	Programme Coordinator, Krishi Vigyan Kendra, Rajhani, Kathua 184 101	94191-51649 (M)
58	Kulgam	May, 2005	Programme Coordinator Krishi Vigyan Kendra, Pombay, Anantnag-192 101	01931-213492
59	Kupwara	May, 2005	Programme Coordinator Krishi Vigyan Kendra, Gushee, Kupwara-193 222	01954-222270
60	Leh	October, 1994	Programme Coordinator, Krishi Vigyan Kendra SKUAST (K), P.B. No. 146, Choglam Road, Housing Colony, Leh – 194 101	01982-267389 254837
61	Poonch	March, 2007	Programme Coordinator, Krishi Vigyan Kendra, Qazi Morha, Poonch- 185101	01965-222965
62	Pulwama	October, 1983	Programme Coordinator, KVK, Malangpura, P.B. No. 1228,Distt.Pulwama, GPO-Srinagar-190001	01933-286952
63	Rajouri	November, 2002	Programme Coordinator, Krishi Vigyan Kendra SKUAST, Regional Research Station, VPO.Tandwal, Rajouri-185131	01962-264277 263202
64	Reasi	November, 2005	Programme Coordinator, Krishi Vigyan Kendra, Vill. Tanda, Dera Baba Bahadur Singh, Teh Riasi, Distt. Reasi-182301	01991-287802
65	Gandarbal	July, 2002	Programme Coordinator, Krishi Vigyan Kendra, Gandarbal, Shuhama, P.B. No. 1277, GPO Srinagar – 190 001 (Erstwhile Srinagar)	0194-2262490
66	Anantnag	March, 2012	Programme Coordinator, Krishi Vigyan Kendra, Tehsil Dooru, District Anantnag-192211	09419050073
67	Shopian	March, 2012	Programme Coordinator, Krishi Vigyan Kendra, Balpora, Tehsil Shopian, District Shopian- 192303	09419529518 09596410202 (M)

Sr. No.	District	Year of Sanction	Location	Telephone Number
68	Budgam	June, 2013	Programme Coordinator, Krishi Vigyan Kendra, Hamchipora-Khag, Budgam-193411	09797037698 09419069280 (M)
69	Baramulla	November, 2013	Programme Coordinator, Krishi Vigyan Kendra, Tangmarg, District Baramulla-193402 (J&K)	0194-2305044 09419011774 (M)
70	Leh Additional	June, 2013	Programme Coordinator, Krishi Vigyan Kendra, Leh (Add.)-194404, Ladakh (J&K)	01981-222066 09418457408 (M)

Details of SAC Meet

Annexure- II

Name of the KVK	Date of SAC Meeting	Number of Participants	Date of SAC Meeting	Number of Participants
Punjab				
Amritsar	27.11.2014	28		
Bathinda	28.08.2014	30		
Faridkot	11.11.2014	32		
Fatehgarh Sahib	28.10.2014	28		
Ferozepur	03.03.2015	55		
Gurdaspur	27.11.2014	44		
Hoshiarpur	21.10.2014	20		
Jalandhar	10.10.2014	25		
Kapurthala	10.10.2014	30		
Ludhiana	05.01.2015	47		
Mansa	28.08.2014	35		
Moga	03.03.2015	37		
Muktsar	11.11.2014	16		
Nawanshahar	21.10.2014	14		
Patiala	09.01.2015	31		
Roopnagar	28.10.2014	35		
Sangrur	19.01.2015	24		
Haryana				
Ambala	19.02.2015	42		
Bhiwani	26.08.2014	26	10.03.2015	25
Faridabad	20.08.2014	34	12.02.2015	26
Fatehabad	25.08.2014	42	27.02.2015	26
Hisar	22.08.2014	46	19.02.2015	37
Jhajjar	28.08.2014	25	18.02.2015	20
Jind	30.08.2014	23	17.03.2015	20
Kaithal	30.08.2014	33	19.03.2015	32
Karnal	05.07.2014	41		
Kurukshetra	19.08.2014	23	24.03.2015	33
Mahendergarh	26.08.2014	17	09.02.2015	18
Panipat	29.08.2014	38	03.03.2015	32
Rewari	24.02.2015	8		
Rohtak	28.08.2014	33	13.02.2015	34
Sirsa	25.08.2014	22	26.02.2015	23
Sonipat	29.08.2014	33	12.03.2015	21
Yamunanagar	19.08.2014	30	25.03.2015	25
Himachal Pradesh				

Name of the KVK	Date of SAC Meeting	Number of Participants	Date of SAC Meeting	Number of Participants
Bilaspur	04.09.2014	49		
Hamirpur	03.07.2014	30		
Kangra	11.07.2014	37		
Kinnaur	02.10.2014	19		
Kullu	19.07.2014	16		
Lahaul & Spiti	27.06.2014	32		
Mandi	18.07.2014	23		
Shimla	07.08.2014	16		
Sirmaur	23.06.2014	25		
Solan	23.12.2014	15		
Una	09.07.2014	23		
Jammu & Kashmir				
Anantnag	13.01.2015	120		
Bandipora	06.12.2014	114		
Doda	09.07.2014	46	19.01.2015	38
Jammu	08.12.2014	37		
Kargil	14.11.2014	38		
Kathua	04.12.2014	35		
Kupwara	10.12.2014	104		
Leh	30.10.2014	76		
Poonch	15.12.2014	25		
Pulwama	03.12.2015	100		
Rajouri	16.12.2014	31		
Reasi	26.12.2014	16		
Shopian	06.01.2015			
Srinagar	12.02.2015	78		
Budgam	12.02.2015	69		
Leh (II)	30.10.2014	80		
Delhi				
Ujwa	11.06.2014	32		

Annexure-III

Details of Vehicles

KVK	Tractor	Jeep	Motor Cycle	Mini Bus
Punjab				
Amritsar	A	A	A	NA
Bathinda	A	A	A	NA
Faridkot	A	A	A	NA
Fatehgarh Sahib	A	A	A	NA
Ferozepur	A	A	A	A
Gurdaspur	A	A	A	NA
Hoshiarpur	A	A	A	NA
Jalandhar	A	A	A	NA
Kapurthala	A	A	A	NA
Ludhiana	A	A	A	NA
Mansa	A	A	A	NA
Moga	A	A	A	NA
Muktsar	A	A	A	NA
Nawanshahar	A	A	A	NA
Patiala	A	A	A	NA
Roopnagar	A	A	A	NA
Sangrur	A	A	A	NA
Barnala	A	A	NA	NA
Mohali	A	A	NA	NA
Tarn Taran	A	A	NA	NA
Haryana				
Ambala	A	A	A	NA
Bhiwani	A	A	A	NA
Faridabad	A	A	A	NA
Fatehabad	A	A	A	NA
Gurgaon	A	A	A	NA
Hisar	A	A	A	NA
Jhajjar	A	A	A	NA
Jind	A	A	A	NA
Kaithal	A	A	A	NA
Karnal	A	A	A	NA
Kurukshetra	A	A	A	NA
Mahendergarh	A	A	A	NA
Panipat	A	A	A	NA
Rewari	A	A	A	NA
Rohtak	A	A	A	NA
Sirsa	A	A	A	NA
Sonipat	A	A	A	NA

KVK	Tractor	Jeep	Motor Cycle	Mini Bus
Yamunanagar	A	A	A	NA
Himachal Pradesh				
Bilaspur	A	A	A	NA
Chamba	NA	A	A	NA
Hamirpur	A	A	A	NA
Kangra	A	A	A	NA
Kinnaur	NA	A	A	NA
Kullu	A	A	A	NA
Lahaul & Spiti	A	A	A	NA
Mandi	A	A	A	NA
Shimla	NA	A	A	NA
Sirmaur	A	A	A	NA
Solan	NA	A	A	NA
Una	A	A	A	NA
Jammu & Kashmir				
Anantnag	A	A	NA	NA
Bandipora	A	A	A	NA
Doda	NA	A	A	NA
Gandarbal	A	A	A	NA
Jammu	A	A	A	NA
Kargil	A	NA	A	NA
Kathua	NA	NA	NA	NA
Kulgam	A	A	A	NA
Kupwara	A	A	A	NA
Leh	A	A	A	NA
Poonch	A	A	A	NA
Pulwama	NA	A	A	NA
Rajouri	NA	A	A	NA
Reasi	A	A	A	NA
Shopian	NA	A	NA	NA
Srinagar	A	A	A	NA
Budgam	NA	A	NA	NA
Leh (II)	NA	A	NA	NA
Baramulla	NA	NA	NA	NA
Delhi				
Ujwa	A	A	A	NA

Staff Position in KVKs as on 31.03.2015 ***Annexure - IV***

	PC			SMS			PA			ADMN			AX			SUPP			TOTAL		
KVK	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**
Amritsar	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	16	**0**
Bathinda	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	16	**0**
Faridkot	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	16	**0**
Fatehgarh Sahib	1	1	0	6	6	0	3	2	1	2	1	1	2	1	1	2	2	0	**16**	13	**3**
Ferozepur	1	1	0	6	5	1	3	3	0	2	1	1	2	2	0	2	2	0	**16**	14	**2**
Gurdaspur	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	16	**0**
Hoshiarpur	1	1	0	6	6	0	3	2	1	2	2	0	2	2	0	2	2	0	**16**	15	**1**
Jalandhar	1	1	0	6	4	2	3	2	1	2	1	1	2	2	0	2	2	0	**16**	12	**4**
Kapurthala	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	15	**1**
Ludhiana	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	16	**0**
Moga	1	1	0	6	5	1	3	2	1	2	2	0	2	2	0	2	2	0	**16**	14	**2**
Muktsar	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	16	**0**
Nawanshahar	1	0	1	6	5	1	3	3	0	2	2	0	2	1	1	2	1	1	**16**	12	**4**
Patiala	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	16	**0**
Ropar	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	15	**1**
Sangrur	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	16	**0**
Mansa	1	0	1	6	6	0	3	2	1	2	1	1	2	2	0	2	1	1	**16**	12	**4**
Total (PAU)	**17**	**15**	2	**102**	**95**	7	**51**	**46**	5	**34**	**30**	4	**34**	**32**	2	**34**	**32**	2	**272**	**250**	**22**
Tarntaran	1	1	0	6	4	2	3	1	2	2	1	1	2	0	2	2	0	2	**16**	**7**	**9**
Mohali	1	1	0	6	2	4	3	3	0	2	1	1	2	1	1	2	2	0	**16**	**10**	**6**
Barnala	1	1	0	6	3	3	3	3	0	2	1	1	2	1	1	2	2	0	**16**	**11**	**5**
Total (GADVASU)	**3**	**3**	0	**18**	**9**	9	**9**	**7**	2	**6**	**3**	3	**6**	**2**	4	**6**	**4**	2	**48**	**28**	**20**
Bhiwani	1	1	0	6	4	2	3	2	1	2	2	0	2	1	1	2	1	1	**16**	**11**	**5**
Faridabad	1	1	0	6	6	0	3	2	1	2	2	0	2	1	1	2	2	0	**16**	**14**	**2**
Fatehabad	1	1	0	6	4	2	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**14**	**2**
Hisar	1	1	0	6	5	1	3	3	0	2	1	1	2	2	0	2	2	0	**16**	**14**	**2**
Jhajjar	1	1	0	6	4	2	3	2	1	2	2	0	2	1	1	2	1	1	**16**	**11**	**5**
Jind	1	1	0	6	3	3	3	2	1	2	2	0	2	2	0	2	2	0	**16**	**12**	**4**
Kaithal	1	1	0	6	3	3	3	0	3	2	1	1	2	2	0	2	0	2	**16**	**7**	**9**

	PC			SMS			PA			ADMN			AX			SUPP			TOTAL		
KVK	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**
Kurukshetra	1	1	0	6	3	3	3	2	1	2	2	0	2	2	0	2	1	1	**16**	**11**	**5**
Mahendergarh	1	1	0	6	3	3	3	2	1	2	1	1	2	2	0	2	1	1	**16**	**10**	**6**
Panipat	1	1	0	6	4	2	3	2	1	2	2	0	2	2	0	2	2	0	**16**	**13**	**3**
Rohtak	1	1	0	6	4	2	3	2	1	2	2	0	2	1	1	2	0	2	**16**	**10**	**6**
Sirsa	1	1	0	6	2	4	3	2	1	2	1	1	2	2	0	2	0	2	**16**	**8**	**8**
Sonepat	1	1	0	6	5	1	3	0	3	2	1	1	2	2	0	2	2	0	**16**	**11**	**5**
Yamunanagar	1	1	0	6	4	2	3	2	1	2	1	1	2	2	0	2	2	0	**16**	**12**	**4**
Total (HAU)	**14**	**14**	0	**84**	**54**	30	**42**	**26**	16	**28**	**22**	6	**28**	**24**	4	**28**	**18**	10	**224**	**158**	**66**
Gurgaon	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**15**	**1**
Karnal	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**15**	**1**
Baramulla	1	1	0	6	0	6	3	0	3	2	1	1	2	0	2	2	1	1	**16**	**3**	**13**
Total (ICAR)	**3**	**3**	0	**18**	**10**	8	**9**	**6**	3	**6**	**5**	1	**6**	**4**	2	**6**	**5**	1	**48**	**33**	**15**
Ambala	1	1	0	6	5	1	3	3	0	2	3	-1	2	2	0	2	2	0	**16**	**16**	**0**
Rewari	1	1	0	6	5	1	3	2	1	2	2	0	2	1	1	2	2	0	**16**	**13**	**3**
Delhi	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**15**	**1**
Total (NGO)	**3**	**3**	0	**18**	**15**	3	**9**	**8**	1	**6**	**7**	-1	**6**	**5**	1	**6**	**6**	0	**48**	**44**	**4**
Bilaspur	1	0	1	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**14**	**2**
Hamirpur	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**15**	**1**
Kangra	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**16**	**0**
Kullu	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	1	1	**16**	**14**	**2**
Lahual & Spiti	1	1	0	6	4	2	3	3	0	2	1	1	2	2	0	2	2	0	**16**	**13**	**3**
Mandi	1	1	0	6	4	2	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**14**	**2**
Sirmour	1	0	1	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**15**	**1**
Una	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**15**	**1**
Total (HPKV)	**8**	**6**	2	**48**	**40**	8	**24**	**24**	0	**16**	**15**	1	**16**	**16**	0	**16**	**15**	1	**128**	**116**	**12**
Chamba	1	1	0	6	3	3	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**13**	**3**
Kinnaur	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	1	1	**16**	**14**	**2**
Shimla	1	1	0	6	5	1	3	2	1	2	2	0	2	2	0	2	2	0	**16**	**14**	**2**
Solan	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**16**	**0**
Total (UHF)	**4**	**4**	0	**24**	**19**	5	**12**	**11**	1	**8**	**8**	0	**8**	**8**	0	**8**	**7**	1	**64**	**57**	**7**

	PC			SMS			PA			ADMN			AX			SUPP			TOTAL		
KVK	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**	**S**	**F**	**V**
Doda	1	1	0	6	5	1	3	2	1	2	2	0	2	1	1	2	2	0	**16**	**13**	**3**
Jammu	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**15**	**1**
Kathua	1	1	0	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**16**	**0**
Poonch	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**15**	**1**
Rajouri	1	1	0	6	5	1	3	2	1	2	1	1	2	2	0	2	2	0	**16**	**13**	**3**
Reasi	1	1	0	6	5	1	3	3	0	2	2	0	2	1	1	2	1	1	**16**	**13**	**3**
Total (SKUAST -J)	**6**	**6**	0	**36**	**31**	5	**18**	**16**	2	**12**	**11**	1	**12**	**10**	2	**12**	**11**	1	**96**	**85**	**11**
Bandipora	1	1	0	6	5	1	3	3	0	2	1	1	2	2	0	2	2	0	**16**	**14**	**2**
Budgam	1	1	0	6	5	1	3	3	0	2	0	2	2	0	2	2	0	2	**16**	**9**	**7**
Srinagar	1	1	0	6	5	1	3	3	0	2	2	0	2	0	2	2	2	0	**16**	**13**	**3**
Kargil	1	1	0	6	6	0	3	3	0	2	1	1	2	2	0	2	2	0	**16**	**15**	**1**
Kulgam	1	0	1	6	6	0	3	2	1	2	1	1	2	1	1	2	2	0	**16**	**12**	**4**
Kupwara	1	1	0	6	6	0	3	3	0	2	0	2	2	2	0	2	0	2	**16**	**12**	**4**
Leh	1	1	0	6	5	1	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**15**	**1**
Pulwama	1	1	0	6	6	0	3	3	0	2	2	0	2	1	1	2	2	0	**16**	**15**	**1**
Gandarbal	1	0	1	6	6	0	3	3	0	2	2	0	2	2	0	2	2	0	**16**	**15**	**1**
Shopian	1	1	0	6	5	1	3	3	0	2	0	2	2	1	1	2	0	2	**16**	**10**	**6**
Anantnag	1	1	0	6	6	0	3	3	0	2	0	2	2	1	1	2	0	2	**16**	**11**	**5**
Leh (II)	1	1	0	6	5	1	3	1	2	2	0	2	2	2	0	2	2	0	**16**	**11**	**5**
Total (SKUAST -K)	**12**	**10**	2	**72**	**66**	6	**36**	**33**	3	**24**	**11**	13	**24**	**16**	8	**24**	**16**	8	**192**	**152**	**40**
Zone Total	**70**	**64**	**6**	**420**	**339**	**81**	**210**	**177**	**33**	**140**	**112**	**28**	**140**	**117**	**23**	**140**	**114**	**26**	**1120**	**923**	**197**

Annexure- V

Specific training aspects under the major themes of training

Crop Production
• Weed Management
• Resource Conservation Technologies
• Cropping Systems
• Crop Diversification
• Integrated Farming
• Micro Irrigation/Irrigation
• Seed production
• Nursery management
• Integrated Crop Management
• Soil and Water Conservation
• Integrated Nutrient Management
• Production of organic inputs
Horticulture
a) Vegetable Crops
• Production of low value and high volume crop
• Off-season vegetables
• Nursery raising
• Exotic vegetables
• Export potential vegetables
• Grading and standardization
• Protective cultivation
• Water management
b) Fruits
• Training and Pruning
• Layout and Management of Orchards
• Cultivation of Fruit
• Management of young plants/orchards
• Rejuvenation of old orchards
• Export potential fruits
• Micro irrigation systems of orchards
• Plant propagation techniques
• Dry land Horticulture
c) Ornamental Plants
• Nursery Management
• Management of potted plants
• Export potential of ornamental plants
• Propagation techniques of Ornamental Plants
d) Plantation crops

• Production and Management technology
• Processing and value addition
e) Tuber crops
• Production and Management technology
• Processing and value addition
f) Spices
• Production and Management technology
• Processing and value addition
g) Medicinal and Aromatic Plants
• Nursery management
• Production and management technology
• Post harvest technology and value addition
Soil Health and Fertility Management
• Soil fertility management
• Integrated water management
• Integrated nutrient management
• Production and use of organic inputs
• Management of Problematic soils
• Micro nutrient deficiency in crops
• Nutrient use efficiency
• Balanced use of fertilizers
• Soil and water testing
• Scaling of water productivity in agriculture
Livestock Production and Management
• Dairy Management
• Poultry Management
• Piggery Management
• Rabbit Management
• Animal Nutrition Management
• Animal Disease Management
• Feed and Fodder technology
• Production of quality animal products
Home Science/Women empowerment
• Household food security by kitchen gardening and nutrition gardening
• Design and development of low/minimum cost diet
• Designing and development for high nutrient efficiency diet
• Minimization of nutrient loss in processing
• Processing and cooking
• Gender mainstreaming through SHGs
• Storage loss minimization techniques
• Value addition
• Women empowerment
• Location specific drudgery production

• Rural Crafts
• Women and child care
Agril. Engineering
• Farm machinery and its maintenance
• Installation and maintenance of micro irrigation systems
• Use of Plastics in farming practices
• Production of small tools and implements
• Repair and maintenance of farm machinery and implements
• Small scale processing and value addition
• Post Harvest Technology
Plant Protection
• Integrated Pest Management
• Integrated Disease Management
• Bio-control of pests and diseases
• Production of bio control agents and bio pesticides
• Advanced technologies in plant protection

Fisheries
• Integrated fish farming
• Carp breeding and hatchery management
• Carp fry and fingerling rearing
• Composite fish culture
• Hatchery management and culture of freshwater prawn
• Breeding and culture of ornamental fishes
• Portable plastic carp hatchery
• Pen culture of fish and prawn
• Shrimp farming
• Edible oyster farming
• Pearl culture
• Fish processing and value addition
Production of Inputs at site
• Seed Production
• Planting material production
• Bio-agents production
• Bio-pesticides production
• Bio-fertilizer production
• Vermi-compost production
• Organic manures production
• Production of fry and fingerlings
• Production of Bee-colonies and wax sheets
• Small tools and implements
• Production of livestock feed and fodder
• Production of Fish feed

• Mushroom production
• Apiculture
• Azolla cultivation
Capacity Building and Group Dynamics
• Leadership development
• Group dynamics
• Formation and Management of SHGs
• Mobilization of social capital
• Entrepreneurial development of farmers/youth
• Farmers Field School
• Youth Empowerment
• Formation of CBAs
Agro-forestry
• Production technologies
• Nursery management
• Integrated Farming Systems
Sericulture
• Production technologies
• Rainfed Sericulture
• Disinfection of rearing house

Annexure – VI

Details of Revolving Funds as provided by the KVKs **(Rs. In Lakhs)**

Sl. NO.	Name of KVK	Year	Opening balance as on 1st April 2014	Income during 2014-15	Expenditure during 2014-15	Net balance in hand as on31.3.2015
1	Ferozepur	2014-15	77.71	17.80	9.00	86.52
2	Nawanshahr	2014-15	150.26	26.00	13.00	162.82
3	Kapurthala	2014-15	47.27	11.41	8.24	50.44
4	Hoshiarpur	2014-15	41.70	10.96	12.94	39.71
5	Patiala	2014-15	110.08	23.81	17.85	116.04
6	Gurdaspur	2014-15	80.56	21.11	9.99	91.66
7	Bathinda	2014-15	57.57	8.84	2.99	63.42
8	Sangrur	2014-15	67.97	13.51	0.00	81.47
9	Faridkot	2014-15	88.26	24.57	12.48	100.35
10	Ropar	2014-15	21.73	0.25	3.00	18.97
11	Muktsar	2014-15	54.10	18.80	12.90	60.00
12	Amritsar	2014-15	146.97	42.84	19.96	169.85
13	Ludhiana	2014-15	56.65	20.66	7.99	78.02
14	Fatehgarh Sahib	2014-15	11.08	10.84	9.83	12.09
15	Moga	2014-15	33.75	11.94	8.95	36.74
16	Jallandhar	2014-15	25.04	16.48	11.49	30.03
17	Mansa	2014-15	8.17	6.98	3.50	11.65
18	Mohali	2014-15	2.00	0.08	0.08	2.26
19	Tarantarn	2014-15	2.00	0.00	0.00	2.00
20	Barnala	2014-15	2.00	0.13	0.02	2.11
21	Yamunanagar	2014-15	56.08	13.44	12.51	57.01
22	Kurukshetra	2014-15	68.95	29.26	15.24	82.97
23	Panipat	2014-15	77.74	55.66	12.42	127.70
24	Jind	2014-15	4.99	22.76	23.09	4.66
25	Kaithal	2014-15	121.19	43.41	13.17	151.43
26	Sonipat	2014-15	5.68	10.21	8.22	45.53
27	Faridabad	2014-15	3.67	2.79	1.33	5.68
28	Hisar	2014-15	10.34	1.64	6.32	12.27
29	Rohtak	2014-15	3.05	13.63	2.61	14.07
30	Sirsa	2014-15	48.22	16.12	0.74	68.65
31	Mahendergarh	2014-15	12.19	4.96	6.37	10.78
32	Jhajjar	2014-15	14.93	1.70	0.65	16.35
33	Bhiwani	2014-15	13.76	3.50	1.95	15.31
34	Fatehabad	2014-15	20.17	8.50	8.63	20.04
35	Kullu	2014-15	7.00	12.10	12.59	6.51

Sl. NO.	Name of KVK	Year	Opening balance as on 1st April 2014	Income during 2014-15	Expenditure during 2014-15	Net balance in hand as on31.3.2015
36	Mandi	2014-15	15.21	8.17	13.48	9.90
37	Hamirpur	2014-15	17.13	13.85	10.80	20.18
38	Kangra	2014-15	35.40	7.70	28.73	14.37
39	Una	2014-15	7.26	11.08	9.19	9.15
40	Sirmour	2014-15	0.60	20.43	19.85	1.18
41	Lahaul & Spiti	2014-15	5.77	1.85	2.44	5.18
42	Bilaspur	2014-15	4.02	5.35	5.63	3.74
43	Chamba	2014-15	12.43	4.78	5.35	11.86
44	Shimla	2014-15	7.56	2.11	8.18	1.49
45	Kinnaur	2014-15	0.75	1.03	1.10	0.68
46	Solan	2014-15	6.26	12.54	13.83	4.97
47	Jammu	2014-15	44.80	5.31	2.52	47.59
48	Rajouri	2014-15	12.33	1.31	0.86	12.78
49	Doda	2014-15	1.41	0.29	0.00	2.18
50	Reasi	2014-15	6.48	1.93	4.26	4.15
51	Poonch	2014-15	5.39	1.77	2.98	4.18
52	Kathua	2014-15	17.97	5.50	5.04	18.43
53	Leh	2014-15	9.85	2.63	1.52	10.96
54	Pulwama	2014-15	12.99	1.81	0.53	14.27
55	Ganderbal	2014-15	3.59	0.00	0.00	3.78
56	Srinagar	2014-15	3.79	1.52	0.50	4.81
57	Kargil	2014-15	5.31	3.96	9.82	6.03
58	Bandipora	2014-15	2.36	0.00	1.00	1.36
59	Kupwara	2014-15	2.70	0.35	1.24	1.81
60	Kulgam	2014-15	0.35	3.39	2.80	0.94
61	Shopian	2014-15	1.00	2.66	2.47	2.69
62	Anantnag	2014-15	1.00	0.00	0.00	1.00
63	Leh II	2014-15	1.00	0.27	0.19	1.08
64	Budgam	2014-15	1.00	0.00	0.00	1.00
65	Rewari	2014-15	34.16	3.75	0.37	37.54
66	Ambala	2014-15	26.60	20.83	14.51	32.92
67	Gurgaon	2014-15	15.16	5.01	3.66	16.51
68	Karnal	2014-15	41.33	12.28	14.74	38.87
69	Baramulla	2014-15	0.00	0.00	0.00	0.00
70	Delhi	2014-15	58.98	9.50	4.03	64.45
	Total		**1974.77**	**699.65**	**481.67**	**2267.14**