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Zonal Project Directorate, Zone VII

Indian Council of Agricultural Research Jabalpur, Madhya Pradesh

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Executive Summary

Zonal Project Directorate, Zone VII has 100 KVKs located in three states namely Madhya Pradesh, Chhattisgarh and Odisha.

KVKs under Zone VII conducted total 6622 *On farm trials on the given fifteen thematic areas and assessed 1131 technologies.*

For implementing the technology at wider scale, a total of 7735 FLDs were conducted on oilseeds, pulses, cereals, vegetables, cash crops, agro-forestry, millets and other important area covering the area of 5192.46 ha in Zone VII. In addition, other income generating enterprises like poultry, goatary, duckery, farm machinery, mushroom, vermi-compost were also covered under 5234 FLDs. Data showed that highest yield increase was observed in fruits, medicinal plants, vegetables, and pulse.

For regular knowledge-updating and imparting new skills, total 10847 training courses were organized benefiting 260452 participants including 215511 farmers and farm women, 24667 rural youth and 20274 extension personnel. Besides, 20 training programmes were conducted by the Directorate as technological backstopping for enhancing their capacity and working efficiency.

For popularizing the technologies in the region, total 65062 extension activities in the form of field days (753), farmers fair (140), farm advisory services (2658), exhibitions (265), film show (1911), etc. were organized which benefited 709460 farmers and 17614 extension personnel in the Zone-VII.

For enhancing the production through quality seeds and planting materials, total 19901.55 q seeds, 38, 76,492 planting materials were produced by the KVKs. In all 111 SAC meetings were conducted and 269 newsletters were published. A total of 80109 soil and water samples were tested by the KVKs. The dedication of KVKs towards farming community reflects from the nine awards conferred to the KVK including Best KVK, scientists and farmers' award.

Important flagship programmes viz; Tribal Sub Plan on pulses, ISOPOM on Maize, NICRA, NFSM-TDHPP- Pulses were also implemented by the KVKs under Zone VII. Demonstration component of NICRA, Technology demonstration for harnessing pulses production under NFSM, cost of milk production from DAHD were implemented to address the concerned issues of agriculture productivity.

Sixth National Conference on KVKs was organized by Agricultural Extension Division, ICAR, New Delhi in befitting manner at Jawahar Lal Nehru Krishi Vishwa Vidyalaya, Jabalpur, Madhya Pradesh during 3-5th December, 2011. The theme of the conference was Enabling Farmers 4 Secondary Agriculture. About 1200 participants (scientists, administrators, directors, policy makers, farmers) participated and benefited during the conference.

Zonal Project Directorate organized Hindi Pakhwada, Vigilance week, World Food day, Science Day, and received first prize in cycling event in ICAR Tournament.

कार्य सारांष

क्षेत्रीय परियोजना निदेषालय अंचल–7 के अन्तर्गत 100 कृषि विज्ञान केन्द्र है जो तीन राज्यों मध्यप्रदेष, छत्तीसगढ़ एवं ओड़ीसा में स्थित है । विभिन्न कृषि विज्ञान केन्द्रों ने 15 विषयों पर आधारित कुल 6622 प्रक्षेत्र परीक्षण आयोजित कर कुल 1131 तकनीकों का मूल्यांकन किया ।

इस अंचल के कृषि विज्ञान केन्द्रों द्वारा विभिन्न तिलहन, दलहन, अनाज, सब्जी, नगदी, कृषि वानिकी और कदन्न फसलों पर कुल 7735 अग्रिम पंक्ति प्रदर्षन आयोजित किये गये जो कि भागों पर 5192.46 हेक्टेयर क्षेत्र पर था । इसके अलावा अन्य आदमी सृजन करने वाली उधमों जैसे मुर्गी पालन, बकरी पालन, बत्तख पालन, कृषि संयंत्र, मषरुम, वर्मी कम्पोस्ट के अन्तर्गत कुल 5234 प्रदर्षन लगाये गये ।

कृषि विज्ञान केन्द्रों द्वारा कुल 10847 प्रषिक्षण कार्यक्रम आयोजित किये गये जिससे 260452 प्रषिक्षणार्थी लाभान्वित हुए जिसमें 215511 कृषक एवं महिलाएँ, 24667 ग्रामिण युवक, एवं 20274 प्रसार कार्यकर्ता षामिल थे । ऑकड़े दर्षाते हैं कि इन प्रषिक्षणार्थियों में पुरुष व महिलाएँ एवं सामान्य एवं अनूसूचित जाति/जनजाति की भागीदारी संतोषजनक रही । इसके अलावा प्रसार निदेषालयों द्वारा कुल कार्यक्रम एवं जोनल इकाई द्वारा 20 कार्यक्रम आयोजित आयोजित किये गये जों कि संबंधित विषय विषेषज्ञों एवं अन्य कर्मचारियों हेतू आयोजित था ।

कृषकों द्वारा तकनीकों को विस्तृत रुप से अंगीकृत करने के लिए कुल 65062 प्रसार कार्यक्रम आयोजित किये गये जिसमें मुख्यतः किसान दिवस (753), किसान मेला (140), प्रदर्षनी (264), फिल्म (1911), इत्यादि षामिल थे जिसके द्वारा 691846 कृषकों द्वारा 17614 विस्तारकर्मी लाभान्वित हुए ।

कृषि विज्ञान केन्द्रों द्वारा कुल 19901.55 कुन्तुल गुणवत्तापूर्ण बीज उत्पादन एवं 3876492 रोपण वस्तुएँ किये गये । जोन में कुल 111 वैज्ञानिक सलाहकर समिति की बैठक आयोजित कि गई 269 समाचार पत्रिका प्रकाषित की गई ।

कृषि विज्ञान केन्द्रों द्वारा मिट्टी एवं जल के नमूने का परीक्षण भी किया जाता है जिसमें अन्तर्गत 80109 मिट्टी एवं जल के नमूने का परीक्षण किया गया ।

निदेषालय में विभिन्न कार्यक्रमों जैसे हिन्दी पखवाड़े सर्तकता जागरूकता सप्ताह, इत्यादि का आयोजन भी किया गया । वर्ष के दौरान भा. कृ. अनु. प. के खेल प्रतियोगिता में प्रथम पुरुस्कार भी अर्जीत किया ।

1. Introduction

Zonal Project Directorate, Zone VII upgraded in March 2009 which was earlier known as Zonal Coordinating Unit established on 11th September 1979 by ICAR in the campus of Jawaharlal Nehru Krishi Vishwa Vidyalaya at Jabalpur, Madhya Pradesh. The Directorate coordinate, monitor and evaluate the mandated activities of 100 KVKs spread across the three states namely Madhya Pradesh, Chhattisgarh and Odisha. Zonal Project Directorate, Zone VII performs following major activities:

- To formulate, implement, monitor and evaluate programmes organized by Krishi Vigyan Kendras.
- To coordinate project related work of various agencies such as State Agricultural Universities (SAUs), ICAR institutes, Voluntary Agencies and Development Departments.
- To serve as feedback point for research and extension systems.
- To maintain liaison with research and extension institutions.
- To coordinate agri-based schemes for successful implementation and better convergence with State/Central Government departments.

1.1 Particulars of KVKs in Zonal Project Directorate VII

Zonal Project Directorate monitors the activities of 100 KVKs in the three states namely Madhya Pradesh, Chhattisgarh and Odisha. The details are as follows:–

Table-1.1: KVKs across the three state in the Zone VII

Name of State	No of Districts	Details of KVK			
		SAU	NGO	ICAR	Total
Chhattisgarh	27	20	0	0	20*
Madhya Pradesh	50	39	07	01	47
Odisha	30	31	0	02	33**
Total	**107**	**90**	**7**	**3**	**100**

Note: *Including two additional KVKs in larger districts; ** Including three additional KVKs in larger districts
SAU - State Agricultural University; **NGO** - Non-Governmental Organization; **ICAR** - Indian Council of Agricultural Research.

Krishi Vigyan Kendra

Realizing the importance of dissemination of technological information in the changing scenario of food and nutritional security, Indian Council of Agricultural Research made an institutional innovation in the form of KVK. It was also envisaged that technology assessed by the KVK will be act as model for line departments and act as a catalyst to improve the existing systems for better delivery mechanism. For proper functioning, great emphasis was given on the strengthening the physical and human infrastructure of KVKs. The name of the host institution managing the KVKs is given in Table 1.2.

Mandate of KVK

Assessment, refinement and demonstration of technology/products.

Activities of KVK

- On farm testing to identify the location specificity of technologies in various farming systems
- Frontline demonstrations to establish production potentials of newly released technologies on farmers' fields and provide feedback
- Training of farmers and farmwomen to update their knowledge and skills in modern agricultural technologies and training of extension personnel to orient them in the frontier areas of technology development
- Work as knowledge and resource centre of agricultural technology for supporting initiatives of public, private and voluntary sector for improving the agricultural economy of the district
- Create awareness about frontier technologies through various extension activities like Farmer fair, Field day, Strategic campaign, Ex-trainees meet, etc.
- The seed and planting materials produce by the KVKs also be made available to the farmers

Table-1.2: Institutional set-up for operational KVKs under ZPD Zone VII.

S No.	Host Institution	No. of KVKs
1.	**Madhya Pradesh**	**47**
	Jawaharlal Nehru Krishi Vishwa Vidhyalaya, Jabalpur	20
	Rajmata Vijyaraje Scindhia Krishi Vishwa Vidhyalaya, Gwalior	19
	Central Institute of Agricultural Engineering, ICAR, Bhopal	1
	Deen Dayal Research Institute, Chitrakut, Satna	1
	Kasturaba Gandhi National Memorial Trust , Indore	1
	Lok Mata Devi Ahilyabai Holkar Social National Mission, Burhanpur	1
	Kallukheda shikhcha Samiti, Jaora, Ratlam	1
	Deen dayal Krishi Vikas Awam Anusandhan Samiti (DKVAAS) Bhopal	1
	Centre for Rural Development and Environment, Sehore	1
	Shri Malwa Mahila Vikas Samiti, Sironj, Vidisha (sub-judice)	1
2.	**Chhattisgarh**	**20**
	Indira Gandhi Agricultural University, Raipur	20
3.	**Odisha**	**33**
	Odisha University of Agricultural & Technology, Odisha	31
	Central Rice Research Institute, ICAR, Cuttack	1
	Central Institute of Freshwater Aquaculture, ICAR, Bhubneswar	1

The KVKs have sanctioned staff strength of 16 members. The current staff position in KVKs of Zone-VII is given in Table 1. 3. Around 61 per cent posts are filled while remaining 39 per cent are vacant. The percentage of vacant posts is comparatively higher in case technical and administrative category.

Table-1.3: Staff position in KVKs under Zone-VII as on March, 2012

S No.	State	Sanctioned Posts	PC (1)		SMS (6)		PA (3)		Admn. (6)		Total	
			Sanc.	Filled	Sanc.	Filled	Sanc.	Filled	Sanc.	Filled	Sanc.	Filled
1	Madhya Pradesh	752	47	24	282	197	141	94	282	161	752	476
2	Chhattisgarh	320	20	16	120	56	60	21	120	60	320	153
3	Odisha	528	33	15	198	146	99	58	198	135	528	354
Total		1600	100	55	600	399	300	173	600	356	1600	983

The details of budgetary information of KVKs in Zonal Project Directorate VII, is given Table 4

Table-1.4: Budgetary information of KVKs and Zonal Project Directorate VII (2011-12)

Sl. No.	Name of State	Budget Estimate	Revised Estimate	Total Release	Actual Expenditure
1	MP	2248.25	2968.72	2968.72	2968.72
2	CG	782.93	1207.77	1207.77	1207.77
3	Odisha	1414.00	2192.63	2192.63	2192.63
4	**ZPD Zone VII**	254.82	253.58	253.58	227.60
Total		**4700.00**	**6622.70**	**6622.70**	**6596.72**

The details of **s**tatus of infrastructure facilities in KVKs under Zone-VII are given in Table 1.5.

Table-1.5: Status of infrastructure facilities in KVKs under Zone-VII

S No.	State	No. of KVKs	Admn. Building			Trainees Hotel			Staff Quarters		
			Completed	In progress	NA	Completed	In progress	NA	Completed	In progress	NA
1	MP	47	32	11	4	35	9	3	33	11	3
2	CG	20	15	0	5	10	0	10	6	0	14
3	Odisha	33	27	0	6	27	0	6	22	0	11
Total		**100**	**74**	**11**	**15**	**72**	**9**	**19**	**61**	**11**	**28**

1.2 Agro-climatic Zones in Zonal Project Directorate, Zone VII

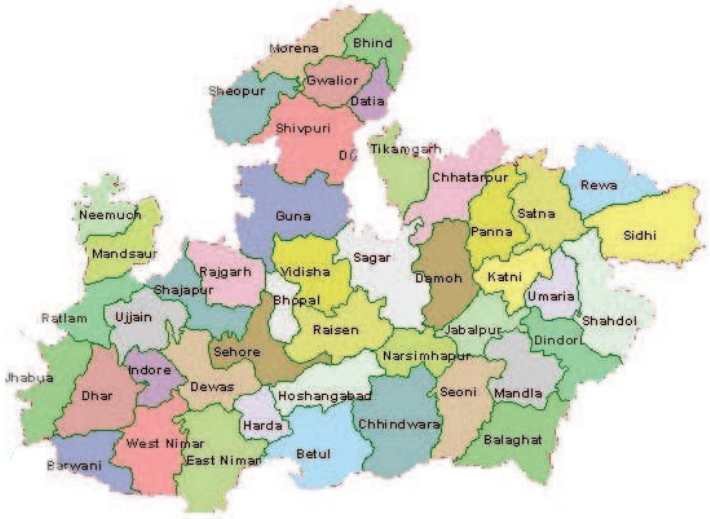
Zonal Project Directorate, Zone VII is having 107 rural districts under its jurisdiction, out of which 100 districts have been covered by KVK. The coverage of KVKs under different agro-climatic zones is as given below.

Table-1.6: Agro-climatic Zones under Zone-VII

State	ACZ	KVK	No. of KVKs
M.P.	Chhattisgarh Plain	Balaghat	01
	North Hills of Chhattisgarh	Shahdol, Umaria, Dindori , Mandla	04
	Bundelkhand Region	Datia, Tikamgarh, Chattarpur	03
	Gird Zone	Guna, Gwalior, Morena, Ashoknagar, Shivpuri, Sheopur, Bhind	07
	Kymore Plateau	Satna, Sidhi, Seoni, Jabalpur, Katni, Panna, Rewa	07
	Jhabua Hills	Jhabua	01
	Malwa Plateau	Indore, Dhar, Dewas, Shajapur, Ujjain, Mandsaur, Ratlam, Rajgarh, Neemach	09
	Nimar Valley	Khandwa, Khargone, Badwani, Burhanpur	04
	Satpura Plateau	Chhindwara, Betul	02
	Vindhya Plateau	Sehore, Bhopal, Raisen, Sagar, Damoh, Vidisha	06
	Central Narmada Valley	Narsinghpur, Hoshangabad, Harda	03
Total	**11 ACZ**		**47**
CG	Chhattisgarh Plain	Bilaspur, Durg, Raipur, Raipir-II, Raigarh, Dhamtari, Jangir-Champa, Mahasamund, Korba, Kanker, Rajnandgaon, Kabirdham	12
	Bastar Plateau	Baster, Dantewada, Bijapur, Narayanpur	04
	North Hills of Chhattisgarh	Surguja, Jashpur, Koria, Surguja-II	04
Total	**3 ACZ**		**20**
Odisha	East and South Eastern Coastal Plain	Cuttack, Jagatsinghpur, Kendrapara, Khurda, Nayagarh,Puri	06
	Eastern Ghat High Land	Koraput,Navarangpur	02
	Mid Central Table Land Zone	Angul,Dhenkanal	02
	North Central Plateau	Keonjhar, Mayurbhanj, Mayurbhanj-II	03
	North Eastern Coastal Plain	Balasore, Jajpur,Bhadrak	03
	North Eastern Ghat	Ganjam, Ganjam-II, Kandhamal, Gajapati, Rayagada	05
	North Western Plateau Zone	Sundergarh, Sundergarh-II, Deogarh	03
	West Undulating Zone	Kalahandi, Nuapada	02
	Western Central Table Land Zone	Bargarh, Jharsuguda, Sambalpur, Boudh Sonepur, Bolangir	06
	South Easterm Ghat	Malkangiri	01
Total	**10 ACZ**		**33**

1.3 Description of the states under Zonal Project Directorate, Zone VII

Madhya Pradesh



There are 50 districts and 11 different agro-climatic zones in the state. The total geographical area of Madhya Pradesh is 30825 thousand hectare of which 48.57 per cent i.e. 14972 thousand ha is being cultivated out of which 6449 thousand ha is cultivated more than once. Around 28 per cent of total geographical area is covered by forest in the state. The economy of state is predominantly based on rainfed agriculture (only 1/3rd of gross cropped area is being irrigated) and the major crops are paddy, wheat, maize and sorghum among cereals, chickpea, pigeon pea, black gram and green gram among pulses, soybean, groundnut and mustard among oilseeds and cotton and sugarcane among commercial crops. Horticulture crops like potato, onion, garlic, including fruits like papaya, banana, oranges, mango and grapes are also grown in the state of Madhya Pradesh. In some parts of the state medicinal crops and narcotic crops are also cultivated. As per 2010-11 statistics, country's 25.84 per cent oilseeds, 18.74 per cent pulses and 8.88 per cent wheat are being produced in Madhya Pradesh. Livestock contributes around 24 per cent to the total value of output from agriculture and allied sector. The state is poised for a breakthrough in soybean cultivation. As per CSO estimates, the Gross State Domestic Product (at current prices) during 2011-12 was Rs. 25990341 lakh, of which Rs. 6388289 lakh (24.58%) is coming from agriculture (CSO, 2012). In the state Kharif crops occupy 60 per cent and Rabi crops 40 per cent area with 71.4 per cent area under food grain production. The agriculture of the state is characterized as small holder agriculture (average size of holding is 2.02 ha) and nearly 29.16 per cent of total 15060557 holdings are small (< 2 ha) where the dissemination of modern agricultural technologies like farm mechanization is challenging task. As per 2004-05 poverty census, around 37 per cent of total rural population is Below Poverty Line in the state. Low literacy (35.45 per cent), undulating topography, large waste land (13.2%), under developed irrigation potential (23%), low ground water utilization, large proportion of rain fed agriculture (75%), practice of Kharif fallows (3.6%), low cropping intensity (143 %), low fertilizer consumption (50 kg/ha), high proportion of low value crops, and high population of low productive live stock are the major constraints of the state. There are 47 KVKs in the state.

Chhattisgarh

Chhattisgarh State comprises of 27 (including 9 newly created districts) districts divided into three agro-climatic zones. It is spread in 13519 thousand hectares with a gross cropped area of 5561 thousand ha. Chhattisgarh state is well known for its minerals and tribal culture. Out of the three Agro-climatic Zones of state viz. Chhattisgarh Plains, Bastar Plateau and Northern Hills, the last two zones are dominated by tribal population. In the state, 40.80 per cent of total rural population is Below Poverty Line. The state is endowed with varied soil types, surplus electricity and farmable agro-ecological conditions. The Gross State Domestic Product of state is Rs. 13553634 lakh out of which 19.83 per cent is contributed by agriculture and allied sector. Around 47 per cent of total geographical area is covered by forest in the state which contributes 19 per cent of total value of output from agriculture and allied. About 74 per cent area of Chhattisgarh plains, 97 per cent of Bastar plateau and 95 per cent in Northern Hills are rainfed. The average annual rainfall of the state is 1200-1400 mm. Rice is the main crop grown in about 37 lakh ha area, which covers 78 per cent of net sown area. The next important crops are pulses followed by minor millets, oilseeds and maize. Chhattisgarh state contributes 4.47 per cent of total rice production of the country, while the contribution of maize is 1.35 per cent for the country. It is a mono cropped area with meager irrigation facilities. The cropping intensity of the region is 135 per cent. The average size of holding is 1.51 ha and 35.87 per cent of total holdings area small (< 2 ha) in the state. Fishery contributes 4.38 per cent to GSDP in the state and there is lot of scope in fish production in the state.

The livestock population of the state is 1.28 crore out of which, 1.01 crore are cattle. Also 60.3 lakh poultry is available in the state. The fish production in the state reaches to about 1.0 lac Mt. There are 20 Krishi Vigyan Kendra is working in the state and all are under the administrative control of Indira Gandhi Krishi Vishwavidyalaya, Raipur.

Odisha

The state covers an area of 15571 thousand ha having 30 administrative districts and 51639 villages. The state is divided into four physiographic divisions and 10 Agro-climatic zones. The Gross State Domestic Product of Odisha during 2011-12 was Rs. 22623614 lakh. Agriculture is the mainstay of State's economy and substance of life for the people. Agriculture and allied sectors contribute Rs. 4169668 laks which accounts around 18.43 per cent of GSDP. Crop sector is major component accounting 64.34 per cent to the total value of output from agriculture and allied followed by livestock (17.23 %) and forestry (12.44 %). Fishery contributes considerably i.e. 6 per cent to the total value of output from agriculture. The average size of holding in state is 1.15 ha and 58.36 per cent of total holdings (5019476) are small. The state has tropical climate, characterised by high temperature, high humidity, medium to high rainfall and short and mild winters. The normal rainfall of the State is 1451.2 mm. Flood, drought and cyclone occurs regularly with varying intensity. Due to frequent occurrence of these natural calamities, there is always reduction in the yield of Kharif rice, the major crop of the State. Similarly, in drought years, there is considerable loss in production of Pulses and Oilseeds both during Kharif and Rabi.The major crops of state are paddy, blackgram, green gram, groundnut, etc. As per 2004-05 poverty census, 46.8 per cent of total population live Below Poverty Line in the state. There are 33 KVKs in the state of which 31 are under the administrative control of OUAT Bhubaneshwar and rest two are under the control of ICAR institutes.

1.4. Thrust Area for the KVKs under Zonal Project Directorate VII

The thrust areas identified for the KVKs are mentioned below:-

1. Sustainable production system through location-specific assessment and demonstrations of technology.
2. Resource conservation through watershed management, soil and water conservation and proper farm mechanization.
3. Development and promotion of crop and enterprise diversification and alternate land use system.
4. Integrated pest and disease management.

5. Promoting rural entrepreneurship in livestock, goatery, poultry, fishery, mushroom, etc. by production, processing, value addition and marketing for higher income.
6. Empowerment of farmwomen and youth through income generating activities and reduction of drudgery.
7. Alternate livelihood support system for marginal, landless labour and farmwomen to check rural migration.

2. Technology Assessment through On-farm testing

The claimed superiority of location specific technologies were tested by KVKs through On-Farm Testings (OFTs) and the numbers of technologies tested as well as trials are given in below mentioned tables. Overall 1131 technologies were tested in the zone through 6622different trials (Table 2.1) of which 951 were on crops, 123 on different enterprises like livestock, fishery, mushroom, etc and 69 on different aspects of women empowerment like drudgery reduction, nutritional security, value addition, etc. The highest number of technologies were tested in the state of Madhya Pradesh (618) followed by Odisha (399) and Chhattisgarh (110) as the number of KVKs are also in the same order. The average numbers of technologies tested per KVK are given presented in Figure shows that overall in the Zone 12 technologies were tested by each KVK. Average numbers of technologies tested per KVK were ranged from nearly 6 in the state of Chhattisgarh to around 15 in the state of Madhya Pradesh.

Table 2.1: State wise Overall Technology assessed during 2011-12

State	No. of technology assessed	No. of Trials
Chhattisgarh	110	501
Madhya Pradesh	622	3727
Odisha	399	2394
Zone	1131	6622

State wise Technologies Assessed

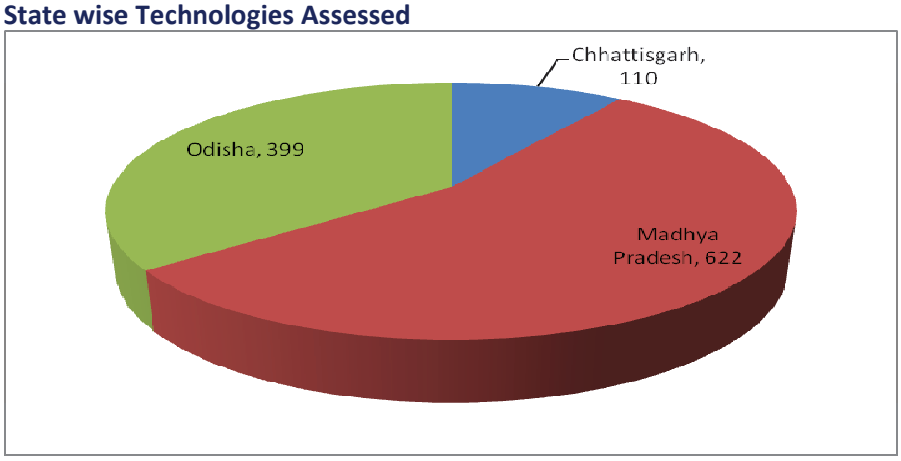


Table 2.2 : Category wise OFTs conducted on crops

Crop Category	No of technology assessed	No of Trials
Cereal	287	1653
Vegetables	165	997
Pulse	140	784
Oilseed	130	719
Spices	118	700
Fruit	43	279
Flower	17	95
Tuber	15	82
Fodder	4	75
Fibre crops	11	68
Sugar	9	54
Forestry	5	22
Millet	5	19
Plantation	1	5
Medicinal	1	5
Total	**951**	**5557**

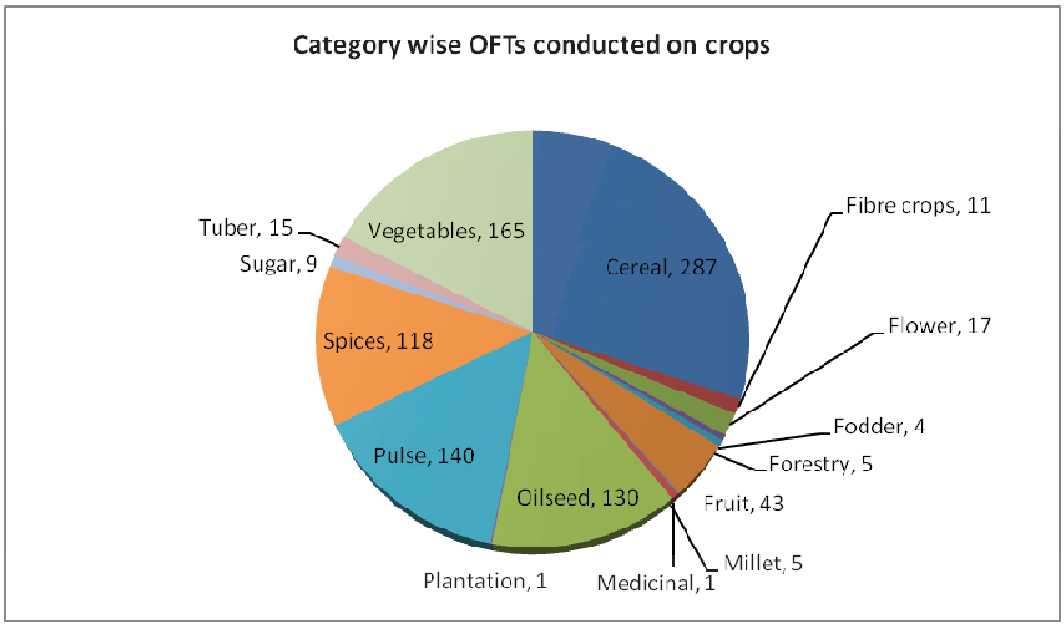


Table 2.3 : Thematic Area wise OFTs conducted on crops

Thematic area	No of technology assessed	No of trails
Drudgery reduction	34	182
Farm Mechanisation	33	153
IDM	90	511
IFS	17	121
INM	173	995
Integrated Crop Management	37	191
IPM	108	786
Resource conservation technologies	27	137
Seed production	3	15
Small Scale income generating enterprises	11	65

Value addition	13	65
Varietal Assessment	310	1753
Weed management	80	424
Others	15	159
Total	**951**	**5557**

Thematic Area wise OFTs Conducted on Crops

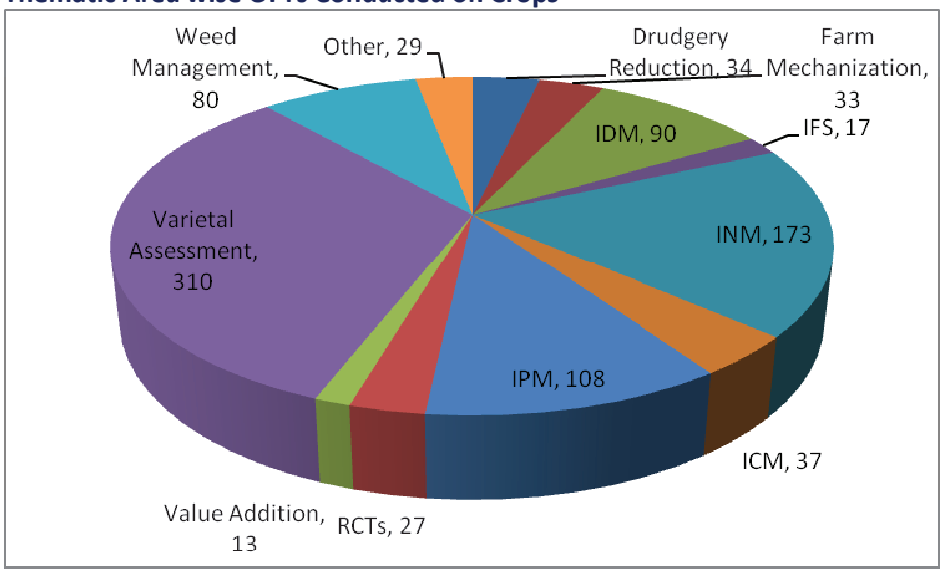


Table 2.8 : Thematic Area wise no. of technology assessed on enterprises

Thematic Area	No of Technologies	No of Trials
Farm Machineries	72	424
Drudgery reduction in Farming Practices	58	336
Nutritional Security through Nutritional Garden	12	62
Small Scale income generating enterprises	24	189
Value addition	7	44
Resources conservation technologies	3	10
Total	**176**	**1065**

Some of the important technologies assessed by KVKs after diagnosing the problems of the area in different sub-heads with major results are given below:

1 Varietal Evaluation

Varietal assessment in Wheat

Problem identified: Low yield of wheat due to use of old verities like – Lok 1
Technology Assessed: Assessment of improved variety of wheat GW 366

Among the various factors responsible for low productivity of wheat at farmers' field, use of seeds of local/ old varieties is most important. With the use of improved variety, the productivity of the crop can be increased. Keeping this in view, KVK Morena, Khargone, Mandsaur, Sheopur, Guna and Shivpuri of the zone planned and conducted on farm trials to assess the performance of the improved variety GW 366 of wheat. The results showed that the yield of this variety was 21.33 per cent higher over the farmers' local variety Lok 1. The number of effective tillers per plant was recorded higher by 27.20 per cent. The net return and BC ratio was found Rs 7133 per ha and 0.269 more with this variety as compared to the farmers variety Lok 1, respectively. The variety gave very good performance in irrigated situation.

Table: Performance of improved wheat variety GW 366

Details	No. of trials	Yield (q/ha)	No. of effective tiller/plant	Net Return (Rs/ha)	BC Ratio
Wheat variety Lok 1 (Farmers' practices)	31	41.25	5.66	39992	3.255
Improved wheat variety GW 366 (Recommended practice)		50.05	7.20	47125	3.524

Varietal assessment in chickpea

Problem identified: Low yield of chickpea due to use of old verities
Technology Assessed: Assessment of chickpea variety JG 16

Several factors are responsible for the low yield of chickpea like pest and disease infestation. These are associated with the variety grown. Farmers are using local verities which are more responsible for the low yield. KVK Korba, Raisen, Damoh, Harda, Sagar, Sehore, Datia and Rajgarh conducted on farm trial to assess the performance of the improved variety JG 16. The results showed that the yield of this variety was 26.15 per cent higher over the farmers' variety. The number of pods per plant was also increased by 7.60 per cent. Similarly the net return and BC ratio was also found to be higher by Rs 4478 and 0.65 with this variety. The variety gave very good performance due to having tolerance to all the major pests and diseases.

Table: Performance of chickpea variety JG 16

Details	No. of trials	Yield (q/ha)	Pods/plant	Net Return (Rs/ha)	BC Ratio
Local varieties like – Ujjain 21 (Farmers' practices)	34	975	23.80	22493	2.590
Improved variety JG 16 (Recommended practice)		1230	25.61	26971	3.240

Varietal assessment in Soybean

Problem identified: Low yield of soybean due to use of old variety
Technology Assessed: Assessment of soybean variety JS 95-60

KVK Dindori, Tikamgarh, Sagar, Mandla and Panna conduced on farm trial to assess the performance of soybean variety JS 95-60. The results of the assessment showed that the variety gave 35.20 per cent higher production over the old variety JS 335. The pods per plant were also increased by 11.51 per cent. The economic analysis showed that the net return is Rs 6839 per ha more with this variety. This variety is largely adopted by the farmers.

Table - Performance of soybean variety JS 95-60

Details	No. of trials	Yield (q/ha)	No. of pods/plant	Net Return (Rs/ha)	BC Ratio
Soybean variety JS 335 (Farmers' practices)	36	12.33	35.6	11278	2.54
Soybean variety JS 95-60 (Recommended practice)		16.67	39.7	18117	2.79

Varietal assessment in garlic

Problem identified: Low yield of garlic due to use of old varieties
Technology Assessed: Assessment of improved variety G-323

KVK Dewas, Dhar, Raisen, Hoshangabad, Bhind and Sheopur conducted on farm trial to assess the performance of the garlic variety G 323 under irrigated condition. The results showed that the yield of this variety was 32.54 per cent higher over the farmers' local variety. The number of clover per bulb and bulb diameter (mm) were also recorded 14.81 per cent and 86.75 % higher over farmers' practices respectively. Similarly the net return and BC ratio were also found to be higher by 52.98 per cent and 23.02 per cent as compared to the farmers' varieties.

The variety gave very good performance in medium land and having tolerance to all the major pests and diseases.

Table: Performance of garlic variety GW 323 under irrigated conditions

Details	No. of trials	Yield (q/ha)	No. of cloves/ bulb	Bulb Diameter (mm)	Net Return (Rs/ha)	BC Ratio
Local varieties like amletta (Farmers' practices)	36	118	27	83	102398	2.786
Garlic Variety – G 323 (Recommended practice)		156.4	31	155	156651	3.422

Varietal assessment in cowpea

Problem identified: Low yield due to use of old and unidentified varieties
Technology Assessed: Assessment of improved cowpea variety Utkal Manik

KVK Nuapada, Koraput, Bolangir Sundargarh, Sonepur and Ganjam conducted an on farm trial to assess the performance of improved cowpea variety Utkal Manik under on farm trials. The results showed that the yield of this variety was 43.58 per cent higher over the local variety. Similarly the net return and BC ratio was also found higher with this variety. The variety gave very good performance in medium land and having tolerance to all the major pests and diseases.

Table: Performance of cowpea variety Utkal Manika

Details	No. of trials	Yield (q/ha)	Net Return (Rs/ha)	BC Ratio
Local variety (Farmers' practices)	30	44.75	36790	2.074
Cowpea variety – Utkal Manika (Recommended practice)		64.25	49167	3.207

Varietal assessment in bottlegourd

Problem Identified: Low yield due to use of local seed materials in bottlegourd.
Technology Assessed: Assessment of bottlegourd HYV Narendra Rasmi

KVK Datia and Hoshangabad conducted on farm trial to assess the bottle gourd HYV Narendra Rasmi under rain fed condition. The results of the on farm trial showed that yield was increase by 33.85 per cent and the Net return increase by Rs. 44875 / ha. Farmers are satisfied with this variety Narendra Rasmi and appreciated the performance under Rain fed condition.

Table : Performance of bottlegourd HYV Narendra Rasmi

Technology Option	No. of Trials	Yield (q/ha)	No. of Fruit/ plant	Net Return (Rs/ha)	BC Ratio
Local variety (Farmers' practices)	15	192	9.6	104400	4.48
HYV Narendra Rasmi (Recommended practice)		257	13.8	149275	5.87

Varietal assessment in brinjal

Problem Identified: Low yielding local varieties of brinjal
Technology Assessed: Assessment of high yielding variety of brinjal BR 14

KVK Sheopur and Bhind conducted on farm trial to assess the brinjal variety BR 14 under rainfed condition. The results shown that yield was increase by 31.07 per cent, while the net return with use of this variety was recorded Rs 131547 per ha higher over farmers variety. The BC ratio was also recorded higher with the variety. The variety also produced 31.25 per cent higher fruits as compared to the farmers' local variety.

Table : Performance of BR 14

Technology Option	No. of Trials	Yield (kg/ha)	No of fruits/plant	Net Return (Rs/ha)	BC Ratio
Local variety (Farmers' practices)	20	177	16	148906	5.05
Brinjal varity BR 14 (Recommended practice)		232	21	280453	7.96

Varietal assessment in brinjal

Problem Identified: Low yield due to use of old varieties.
Technology Assessed: Assessment of high yielding variety of Brinjal- Pusa Uttam.

KVK Gwalior and Kanker conducted on farm trials and assessed the brinjal variety Pusa Uttam during rabi season. The results of the on farm trial showed an increase in yield by 42.86 per cent, while the net return was increased by Rs. 28980 per ha. The fruit yield per plant was also recorded 11.24 per cent higher over that of under farmers' variety. Farmer realized the more productivity of Pusa Uttam under irrigation condition.

Table : Performance of brinjal variety Pusa Uttam

Technology Option	No. of Trials	Yield (kg/ha)	Fruit weight/plant (g)	Net Return (Rs/ha)	BC Ratio
Use of old and traditional varieties (Farmers' practices)	15	280	845	108945	3.446
HYV Pusa Uttam (Recommended practice)		400	940	137925	3.944

Varietal assessment in cauliflower

Problem Identified: Low yield due to use of local variety
Technology Assessed: Assessment of early cauliflower variety (Kashi Kunwari)

KVK Korba, Jabalpur and Balaghat conducted on farm trial to assess the cauliflower mid early variety Kashi Kunwari under irrigated condition. The results of the on farm trial showed that the yield of this variety was higher by 29.15 per cent, the net return was 27.43 per cent higher. Farmers are satisfied with this mid early cauliflower variety.

Table: Assessment of early cauliflower variety (Kashi Kunwari)

Technology Option	No. of Trials	Yield (kg/ha)	Curd weight (g)	Net Return (Rs/ha)
Traditional varieties of cauliflower (Farmers' practices)	10	159.5	485	146545
Mid-early Cauliflower variety - Kashi Kunwari (Recommended practice)		206	845	186735

Varietal assessment in chilli

Problem Identified: Low yield of chilli due to use of local variety
Technology Assessed: Assessment of high yielding variety of chilli Kashi Anmol

KVK Gwalior and Bhind conducted on farm trial to assess the improved variety Kashi Anmol of chili under irrigated condition. The results of these on farm trials showed an increase of 32.43 per cent in yield over the farmers' local verities. The net return and BC ratio were also recorded higher by Rs. 55878 / ha and 24.78 per cent respectively.

Table : Performance of improved variety Kashi Anmol of Chili

Technology Option	No. of Trials	Yield (kg/ha)	No. of fruits/plant	Net Return (Rs/ha)	BC Ratio
Use of local varieties (Farmers' practices)	25	111	78.0	120743	3.550
High yielding variety of chill Kashi Anmol (Recommended practice)		147	87.5	176620	4.430

Varietal assessment in marigold

Problem identified: Low yield and poor quality of flowers due to use of local varieties
Technology Assessed: Assessment of improved marigold variety Pusa narangi

Farmers get low production and poor quality of marigold flowers due to use of local or desi varieties. KVK Datia, Shahdol, Tikamgarh, Malkangiri and Gwalior of Madhya Pradesh conducted several on farm trial to assess the performance of improved marigold variety Pusa narangi. The results of these trials showed a considerable increase in the flower production, which was increased by 31.51 per cent. The size of flowers was also found good, which was 33.95 per cent better to the normally grown varieties. The net return and BC ratio were also found higher by 63.34 per cent and 8.73 per cent with this variety. The variety gave very good performance and the farmers received good monetary returns.

Table: Performance of improved marigold variety Pusa narangi

Details	No. of trials	Yield (q/ha)	Size of flower (mm)	Net Return (Rs/ha)	BC Ratio
local varities (Farmers' practices)	30	227.1	102.8	39520	4.06
Improved marigold variety Pusa narangi (Recommended practice)		298.67	137.7	64553	4.42

2. Integrated Nutrient Management

Integrated Nutrient Management in Paddy

Problem identified: Low yield of paddy due to imbalanced nutrition
Technology Assessed: Assessment of integrated nutrient management practices in paddy

KVKs Bhatapara, Korba, Dhamtari and Raigarh (Chhattisgarh); Jabalpur and Katni (Madhya Pradesh) and Koraput, Malkangiri, Boudh and Kandhamal (Odisha) planned and conducted several on farm trials to assess the effects of IPNS in paddy crop. The improved technology comprising of soil test based balance nutrition of NPK @120:60:40 along with 5 kg Zn/ha. Besides that the bio fertilizers i.e. blue green algae 10-12 kg/ha and PSB @ 5 kg/ha were applied. Farm Yard Manure @ 8-10 ton/ha was also supplied at the time of final field preparation it improves fertilizers use efficiency and encourages the physical property of soil which gave ultimate response of IPNS in terms of higher production and productivity of paddy crop. The data showed that the yield increased was 33.38 per cent comparatively to traditional farmers practice. The farmers gain net return Rs 5280 which was 29.73 per cent higher in comparison to farmers practice.

Table: Performance of integrated nutrient management in paddy

Details	No. of trials	Yield (q/ha)	No of Seed/panicle	Net Return (Rs/ha)	BC Ratio
Imbalance use of fertilizers (150:40:20 kg NPK/ha) (Farmers' practices)	36	32.56	115.32	17762	1.83
Application of 120:60:40 kg NPK/ha + 5 kg zinc + BGA 12 kg /ha+FYM+PSB (Recommended practice)		43.43	128.65	23042	2.17

Integrated Nutrient Management in Soybean

Problem identified: Low yield of soybean due to imbalanced nutrition
Technology Assessed: Assessment of integrated nutrient management practices in soybean

KVK Seoni, Damoh, Khandwa, Khargone, Mandsaur, Jhabua, Ratlam, Sehore and Burhanpur conducted several on farm trial for assessing the effects of sulphur nutrition in soybean crop. The data revealed that the application of sulphur @ 20 kg/ha with recommended dose of fertilizer received 27.09 per cent higher yield comparatively to farmers practice. The farmers gained Rs 7985 more as net income with BC ratio 3.047 in comparison to the farmers practice of 2.635. Therefore, it is clear that the application of sulphur increases the yield of soybean. On the basis of conducted trial it is concluded that sulphur application is must in soybean crop for maintaining higher yield with better quality of produce.

Table: Performance of integrated nutrient management in soybean

Details	No. of trials	Yield (q/ha)	Pods/ plant	Net Return (Rs/ha)	BC Ratio
Use of only DAP @ 100 kg/ha (Farmers' practices)	25	25.29	39.46	17398	2.635
Balanced dose of fertilizers on soil test basis with bio-fertilizers and Zn & S (Recommended practice)		32.14	45.34	25383	3.047

Integrated Nutrient Management in Chickpea

Problem identified: low yield of chickpea due to imbalanced nutrition

Technology Assessed: Assessment of Integrated nutrient management practices in chickpea

Among the various other reasons responsible for the low productivity of chickpea, the imbalanced nutrition is major. KVK Bhatapara and Jashpur of Chhattisgarh and Sagar, Hoshangabad, Sidhi and Burhanpur of Madhya Pradesh conducted many on farm trials to assess the performance of the integrated nutrient management practices in chickpea. These integrated nutrient management practices involved the use of bio-fertilizers and organic manure along with soil test based application of chemical fertilizers. The results of these trials showed 51.91 per cent higher yield as compared to the yield obtained under farmers' practices, while the net return and BC ratio were also increased considerably. The technology also showed an increase in the number of pods per plant by 49.33%.

Table: Performance of Integrated nutrient management in chickpea

Details	No. of trials	Yield (q/ha)	Pods/ plant	Net Return (Rs/ha)	BC Ratio
Imbalanced nutrition (Farmers' practices)	8	10.75	42.55	23948	2.765
Use of bio-fertilizers (Rhizobium and PSB) and organic manure along with soil test based RDF (20:60:20 kgNPK per ha) (Recommended practice)		16.33	63.54	29725	3.645

Integrated Nutrient Management in Chickpea

Problem identified: Low yield of chickpea due to imbalanced nutrition

Technology Assessed: Assessment of use of molybdenum practices in chickpea

The deficiency of micro-nutrients specially molybdenum, is correlated with the low yield of the chickpea. KVK Guna, Shajapur and Sehore conducted several on farm trials to assess the performance of molybdenum in chickpea. The results showed that the yield of chickpea due to seed treatment by ammonium molybdate was increased by 17.48 per cent. The number of pods per plant was also increased by 15.52 per cent. Similarly the net return and BC ratio

were also found Rs 8796 per ha and 0.397 more with the technology as compared to the no use of molybdenum, respectively.

Table: Performance of seed treatment with ammonium molybdate in chickpea

Details	No. of trials	Yield (q/ha)	Pods/ plant	Net Return (Rs/ha)	BC Ratio
No use of molybdenum (Farmers' practices)	5	21.00	34.8	28783	2.790
Assessment of ammonium molebdate through the seed treatment (Recommended practice)		24.67	40.2	37579	3.187

3. Integrated Pest Management

Integrated Pest Management in Chickpea

Problem identified: Low productivity of chick pea due to severe infestation of chickpea pod borer.
Technology Assessed: Assessment of IPM module for chickpea pod borer in chickpea.

KVK Panna, Shahdol, Sidhi, Umaria, Bhind and Neemuch conducted on farm trials for assessing the integrated pest management of pod borer in chickpea. The result of the on farm trials showed that the yield was increased by 10.76 per cent and incidence pod borer decreased by 89.69 per cent. The net return was also increased by Rs. 9316 per ha given in following table.

Table: Effect of IPM Module for Management of Pod Borer in Chickpea

Details	No. of trials	Yield (q/ha)	Pest Incidence (Sq.m.)	Net Return (Rs/ha)	BC Ratio
Indiscriminate use of insecticide (Farmers' practices)	14	277.33	10.48	19533	3.115
Deep summer ploughing +Installation of T-shape bird perches@20 ha+ application of HNPV @250LE/ha +need based insecticide (Recommended practice)		307.17	1.08	28849	3.470

Integrated Pest Management for Shoot and Fruit Borer in Brinjal

Problem identified: Low yield of brinjal due to heavy infestation of shoot and fruit borer
Technology Assessed: Assessment of integrated pest management practices for managing fruit & shoot borer in brinjal

Fruit and shoot borer in brinjal is a major pest responsible for destrying the fruits and reduction in yield. KVK Dindori, Umaria, Rewa and Gwalior of Madhya Pradesh and KVK Puri, Balasore, Ganjam, Kandhamal and Mayurbhanj of Odisha conducted several on farm trials to manage the pest effectively. Pheromone traps @10/ha were used for monitoring of fruit & shoot borer of brinjal. Bio-pesticides and Need based application of pesticides viz. Propiconazole 25%EC or Cholrantraniliprole or Thiacloprid was done for controlling the pest.

The results showed that the yield due to this technology was recorded 28.75 per cent higher over the farmers' practices. The damage in fruits was also reduced by 74.04 per cent due to the use of integrated pest management practices. The net return and BC ratio were increased by 31.85 and 9.25 per cent, respectively.

Table: Performance of integrated pest management practices in brinjal

Details	No. of trials	Yield (q/ha)	Fruit damage (%)	Net Return (Rs/ha)	BC Ratio
Use of pesticides only (Farmers' practices)	56	185.63	27.2	84734	3.135
integrated pest management measure including Pheromone traps, Bio-pesticides and Need based use of pesticides (Recommended practice)		239.00	7.06	111723	3.425

4. Integrated Disease Management

Integrated Disease Management in Paddy

Problem identified: Low yield of paddy due to blast disease

Technology Assessed: Assessment of tricyclozole against blast in paddy

Paddy is a major crop of Chhatisgarh, Odisha and Madhya Pradesh. Paddy crop is infected by several diseases from seedling stage to maturity out of which blast disease having major significance because the fungus affect the crop at reproductive stage and directly reduce the yield. KVKs Janjgir and Raigar of Chhattisgarh; KVK Seoni, Rewa and Datia of Madhya Pradesh and KVK Khurda, Balasore and Deogarh of Odisha conducted on farm trials for assessing the tricyclozole against blast disease in paddy. The result of on farm trials showed that incidence of blast decreased 44.84 per cent and yield of Paddy increased by 20.65 per cent. The net return was also increased by Rs. 9174 per ha given in Table.

Table: Effect of Tricyclozole against blast disease in Paddy.

Technology Option	No. of Trials	Yield (q/ha)	Net Return	BC Ratio	No. of infected tillers/ Sqm
Spraying of any fungicide after neck infection (Farmers' practices)	41	36.37	21801	2.051	12.351
Spraying of tricyclozole @ 250 g/ha at panicle initiation stage (Recommended practice)		43.88	30975	2.362	6.813

Integrated Disease Management in Onion

Problem identified: Low yield of onion due to infestation of diseases

Technology Assessed: Assessment of IDM module in onion

KVK Mandsaur, Khandwa of Madhya Pradesh and KVK Sonepur of Odisha conducted many on farm trials for assessing the IDM module against soil borne disease in brinjal. The result of the farm trials showed that incidence of wilt decreased by 80.57 per cent and yield of brinjal increased by 32.15 per cent. The net return was also increased by Rs. 23850 per ha given in following table.

Table: Effect of IDM module for management of soil borne disease in brinjal

Technology Option	No. of trials	Yield (q/ha)	Net Return	BC Ratio	% disease incidence
Spraying of any fungicide (Farmers' practices)	25	169.5	63800	4.020	16.26
Mancozeb 75 WP for management of disease with seed treatment (Recommended practice)		224	87650	4.610	3.16

Integrated Disease Management in Chickpea

Problem identified: Low yield of chickpea due to soil borne diseases
Technology Assessed: Assessment of IDM module in chickpea

KVK Dhamtari (Chhattisgarh), Rewa, Panna, Tikamgarh, Dewas, Sehore, Sheopur, Datia, Dhar and Mandsaur (Madhya Pradesh) assessed the technology of integrated disease management in chickpea. Use of integrated approach reduced the disease incidence by 70.63 per cent and increased the yield by 14.86 per cent. The net return due to the use of this technology increased 35.59 per cent by Rs. 8059 per ha given in Table.

Table: Effect of IDM Module for Soil borne Disease in Chickpea

Technology Option	No. of Trials	Yield (q/ha)	No. of infected plants/sq.m.	Net Return	BC Ratio
Indiscriminate use of plant protection chemical (Farmers' practices)	27	12.79	14.3	22642	2.839
Summer ploughing+ crop rotation+ seed treatment with *T.viride* or Carbendazim @3g/kg (Recommended practice)		14.69	4.2	30701	3.060

Integrated Disease Management in Groundnut

Problem identified: Low yield of groundnut due to soil borne disease
Technology Assessed: Assessment of bio-fungicide with Carboryl 37.5%+ Thiram 37.5% and/ or *Trichoderma viridae* for management of wilt in groundnut.

KVK Shivpuri (Madhya Pradesh) and KVK Gajapati, Kandhamal, Nayagarh, Sambalpur and Nuapada (Odisha) conducted an on farm trials for assessing the seed treatment for management of fruit soil borne disease in ground nut. The result of the on farm trial showed that the yield was increased by 14.29 per cent and incidence of wilt decreased by 82.58 per cent. The net return was increased by Rs. 11152 per ha given in following table.

Table: Effect of seed treatment on soil borne disease in groundnut

Technology Option	No. of trials	Yield (q/ha)	Wilting (%)	Net Return	BC Ratio
No seed treatment (Farmers' practices)	15	14.00	6.43	10676	1.810
Groundnut seed treatment with Carboryl 37.5%+ Thiram 37.5% @ 3 g/kg and/ or *Trichoderma viridae* @ 10g/ kg of seed (Recommended practice)		16.00	1.12	21828	1.805

5. Resource Conservation Technologies

Problem identified: Poor germination and low yield of soybean due to moisture imbalance
Technology Assessed: Sowing of soybean on ridges under ridge and furrow system

KVK, Dhar and Khandwa assessed ridge and furrow method of sowing soybean as compared to the normal sowing (sowing in furrow). Poor germination is a major problem in soybean due to excess rainfall. The ridge & furrow system of sowing enhance moisture regime around the root zone of soybean. It prevents water logging, drains excess water safely through furrow during heavy rain condition and also makes available adequate moisture during dry spell by conserving the rain water in furrows. Results of these trials at two locations showed that this system of sowing enhance the yield by 16 percent compared to farmers' practice due to improved conditions of moisture around the root zone.

Table- Performance of ridge & furrow sowing in soybean

Details	No. of trials	Moisture content (%)	Yield (q/ha)	Pod/plant (Nos.)	BC Ratio
Sowing in furrow (Farmers practice)	10	19	13.4	28	2.2
Sowing of soybean in ridge & furrow system (Recommended practice)		22	15.6	33	2.7

Problem identified: Low yield of soybean due to excess rains in heavy soils
Technology Assessed: Sowing of soybean in Broad Bed and Furrow system

KVK, Rajgarh and Sehore assessed Broad Bed and Furrow method of sowing the soybean as compared to the normal sowing (sowing in furrow). Excess rainfall affect adversely to development of soybean plant. In the Broad Bed and furrow system, soybean is sown on the bed. There are furrows on both the sides of bed. Beds may have different width to accommodate 2-4 lines of soybean. Furrow depth is kept 3-6 inches which works to conserve rain water within the field and to safe discharge of excess water. It enhances the moisture regime in the root zone in adverse conditions of rainfall. Results of these trials at two locations showed that this system of sowing enhance the yield by 16.1 per cent

Table- Performance of ridge & furrow sowing in soybean

Details	No. of trials	Yield (q/ha)	Pod/plant (Nos.)	BC Ratio
Sowing in furrow (Farmers Practice)	5	17.4	35	2.2

Sowing of soybean in Broad Bed and furrow system (Recommended practice)		20.2	42	2.4

Problem identified: Poor yield due to moisture stress condition at crucial stage of crop

Technology Assessed: Sowing of soybean/arhar in Raised Bed System

KVK, Ujjain and Satna assessed Raised Bed and Furrow method of sowing the soybean and pigeonpea respectively as compared to the normal sowing (sowing in furrow). Crop is sown on the raised bed and furrow whose depth is kept 4-6 inches, works for in-situ rain water conservation within the field and safe discharge of excess water. It enhance the moisture regime in the root zone in adverse conditions of dry spell of rainfall. Results of these trials at two locations showed that this system of sowing enhance the yield by 25.90 per cent.

Table- Performance of raised bed planting in soybean

Details	No. of trials	Soybean Yield (q/ha)	Pigeonpea Yield q/ha	wheat Yield q/ha	BC Ratio
Sowing in furrow (Farmers Practice)	15	16.6	12.4	41	1.9
Sowing of soybean/ Pigeon pea / wheat in Raised Bed and furrow system by raised bed panter (Recommended practice)		20.9	15.2	54	2.4

Problem identified: No production of vegetable due to water scarcity

Technology Assessed: Drip irrigation for vegetables production

KVK, Dindori and Chhindwara assessed drip irrigation for vegetable production. Tomato is being taken in the area but due to scarcity of water, some farmer could not cultivate and some farmer could not get expected yield. Drip irrigation helps in irrigate the crop with minimum water and also supply precious fertilizers to root zone.

Drip irrigation system enables farmers to take vegetable crop and efficient utilization of water and fertilizers. It enhanced the yield by 28.31 per cent as compared to traditional method.

Table- Performance of drip irrigation system for vegetable production

Details	No. of trials	Yield (q/ha)	Net Return Rs./ha	BC Ratio
Flood irrigation system (Farmers practice)	10	226	150000	3.40
Drip irrigation system (Recommended practice)		290	187500	3.75

Problem identified: Low yield of chilli / mango due to water scarcity

Technology Assessed: Plastic mulching and drip irrigation for Chilli/ Mango plantation

KVK, Khargone and Sambalpur assessed plastic mulch and drip irrigation for chilli and mango production respectively. Plastic mulching helps in minimizing evaporation losses, weed infestation and water requirement. Drip irrigation helps to irrigate the crop with minimum water and also supply precious fertilizers efficiently around root zone.
Drip irrigation and mulching enhanced the chilli yield by 60 per cent as compared to traditional method.

Table- Performance of drip irrigation system for vegetable production

Details	No. of trials	Chilli Yield (q/ha)	Net Return Rs/ha	BC Ratio
Flood irrigation system (Farmers practice)	8	230	61795	2.17
Drip irrigation system (Recommended practice)		368	129835	2.43

Problem identified: Low yield of vegetables/ wheat and fruit cracking in tomato due to irrigation water shortage
Technology Assessed: Sprinkler irrigation method

KVK, Deogarh, Angul & Chhindwara assessed the sprinkler irrigation in vegetables and KVK Dindori in Wheat as compared to the traditional flood irrigation method. Result of this OFT showed that the sprinkler irrigation enhanced the yield by 28.57 per cent compared to flood irrigation in wheat and saved water (about 80 per cent) and time also. The technology is found most suitable for efficient management of irrigation water in dry lands.

Table- Performance of border strip method of irrigation in wheat

Details	No. of trials	Tomato yield kg/ha	Net Return Rs./ha	BC Ratio
Flood irrigation method (Farmers Practice)	13	224	98600	3.6
Sprinkler irrigation method (Recommended practice)		288	140000	4.7

6. Weed Management

Problem identified: Low yield of wheat due to heavy infestation of weeds.
Technology Assessed: Assessment of Metsulfuron methyl +Sulphosulphuron for weed management in wheat

KVK Neemuch, Mandsaur, Dewas, Morena, Shahdol, Umaria, Sidhi and Harda of Madhya Pradesh and KVK Kanker of Chhattisgarh conduced on farm trials to assessed the performance of metsulfuron + salphosulphuron wedicides and found that the use of these weedicides reduced the weed infestation by 89.10 per cent and increase the crop yield by 23.75 per cent. The net return was also increased by Rs 10513 per ha. The weedicide was found very effective and recommended for weed control of narrow and broad leaf weeds

Table: Performance of Metsulfuron + Salphosulphuron for weed management

Technology Option	No of trials	Yield (q/ha)	Weed density (per sq. m.)	Net Return (Rs/ha)	B:C Ratio

No use of weedicides and weed management practices (Farmers' practices)	36	32.50	19.45	25471	2.881
Use of Sulfosulfuron methyl 75% + Metsulphuron methyl 5% WG (Recommended practice)		40.22	2.12	35984	3.264

Problem identified: Low yield of soybean due to heavy infestation of weeds.
Technology Assessed: Assessment of Imazethapyr for weed management in soybean

KVK Neemuch, Guna, Dhar and Dindori of Madhya Pradesh conduced on farm trials to assessed the performance of Imazethapyr weedicides and found that the use of this weedicide reduced the weed infestation by 84.55 per cent and increase the crop yield by 19.55 per cent. The net return was also increased by Rs 6697 per ha. The weedicide was found very effective and recommended for weed control of narrow and broad leaf weeds.

Table: Performance of Imazethapyr for weed management in soybean

Technology Option	No of trials	Yield (q/ha)	Weed /r sq. m.)	Net Return (Rs/ha)	B:C Ratio
Use of other pre emergence weedicide (Farmers' practices)	10	14.27	8.8	16934	2.240
Imazethapyr @ 1.0 lit/ha (Recommended practice)		17.06	1.36	23631	2.625

Problem identified: Low yield of paddy due to severe crop-weed competition
Technology Assessed: Assessment of herbicide chlorimuron ethyle and Metsulfuron in paddy

KVK, Jashpur, Kanker and Bilaspur (Chhattisgarh), Gwalior (Madhya Pradesh) and Gajapati, Deogarh, Sambalpur and Puri (Orissa) conducted 38 on farm trials to assess the performance of herbicides Chlormuron + Metsulfuron in controlling the weeds in paddy. The results of the on farm trial showed that yield under the use of these weedicides was 28.80 per cent higher over no use of pesticides, while the weed density was reduced by 349 per cent. The net return is also increased by 7844 under the use of weedicides as compared to non use of weedicides.

Table - Performance of application of herbicide chlorimuron ethyle and Metsulfuron in paddy

Details	No. of trials	Yield (q/ha)	Weed density (per sq. m.) (per sq. m.)	Net Return (Rs/ha)	BC Ratio
No use of weedicides (Farmers' practices)	38	22.71	11.65	13952	2.233
Use of chlorimuron ethyle and Metsulfuron in paddy (Recommended practice)		29.25	3.43	21796	2.572

7. Storage

Problem identified: Heavy damage in seed due to improper storage.
Technology Assessed: Assessment of parad tablets for safe storage of seeds.

KVK Mayurbhanj conducted trial on proper storage of seeds to avoid losses. Parad tablets were used for storage and it was found that the loss in grain weight by 70.23 per cent with increased storage cost of Rs 275 for 10 q seeds. Storage pests of food grains can be very well managed by using one parad tablet per two kg of food grains.

Table-39: Performance of parad tablets for Safe Storage of Seed

Technology Option	No. of Trials	Loss in grain weight (%)	Cost of storage (Rs/ 10q)
No proper storage practices (Farmers' practices)	05	35.4	-
Use of parad tablets for storage of food grains (Recommended practice)		10.54	275

8. Farm Mechanization

Problem identified: Labour intensive and less efficient activity of ground nut digging
Technology Assessed: Ground nut digging by Tractor drawn Ground nut digger

KVK, Sambalpur have assessed the Groundnut digger for digging of groundnuts from the field as compared to manual digging. With this mechanized digger, harvesting capacity of groundnut increased by 135 times, while cost reduced by 5 per cent.

Table : Performance of tractor drawn groundnut digger for groundnut digging

Details	No.of trials	Field coverage ha/hr	Cost of operation Rs/ha	B:C Ratio
Manual Digging by hand (Farmers' practices)	5	0.005	28300	1.43
Ground nut digging by Tractor drawn Ground nut digger (Recommended practice)		0.675	27700	1.64

Problem identified: Inefficient cleaning/ grading of soybean through hand operated sieves time consuming and labour intensive process of grading
Technology Assessed: Spiral grader

KVK, Seoni and Mandsaur have assessed the Spiral grader for cleaning/ grading of soybean. This equipment separate the round shape seeds on the basis of gravity and centrifugal force. Seeds allow to flow in spiral path with gravity force and get separated at bottom. Germination of graded soybean seed was found 85 per cent while it was 64 per cent in non graded seed. Grading capacity is increased by 8.33 times than manual grading.

Table : Performance of spiral grader for soybean

Details	No. of	Labour	Increase in	BC

	trials	requirement (man-hr/ q)	grading capacity	Ratio
Manual grading by hand sieve (Farmers' practices)	5	5.5		2.01
Spiral grader (Recommended practice)		0.66	8.33 times	2.68

Problem identified: Time, labour and cost intensive manual weeding.

Technology Assessed: Power weeder

KVK, Angul, Bilaspur and Sambalpur have assessed the power weeder for weeding in paddy fields while KVK Bolangir assessed in cotton fields. This weeder is self propelled having petrol engine for power. Cotton yield was increased by 7 per cent, while paddy yield increased by 22 per cent. With this mechanization, weeding time reduced to 1/25 times in addition to 40 per cent cost saving.

Table : Performance of power weeder in paddy

Details	No. of trials	Area coverage (ha/hr)	Cost of operation (Rs/ha)	B:C Ratio
Manual weeding by sickle (Farmers' practices)	19	0.005	3920	1.8
Power weeder (Recommended practice)		0.133	2250	2.1

Problem identified: Time, cost and moisture intensive seedbed preparation for wheat after paddy

Technology Assessed: Sowing of wheat by Zero till seed drill

KVK, Seoni and Gwalior assessed Zero till seed drill for sowing of wheat. This seed drill is used for minimum tillage and to conserve in-situ moisture in fields soon after harvesting paddy. No pre-sowing irrigation is required for sowing wheat by Zero till seed drill. Such practice have increased yield by 10.6 per cent while conserving in-situ moisture. Increase in yield maybe due better moisture regime around the root zone. There were net profit of Rs.14300 by investing 3000 Rs./ha.

Table : Performance of zero till seed drill for sowing of wheat

Details	No. of trials	Yield (q/ha)	Net Return (Rs./ha)	B:C Ratio
Sowing of wheat by traditional plough/ dufan (Farmers' practices)	10	36.25	32850	3.1
Zero till seed drill (Sowing of wheat) (Recommended practice)		40.12	47150	3.6

Problem identified: Low yield due to improper placement of fertilizer

Technology Assessed: Sowing and fertilizer application through seed-cum-fertilizer drill

Seed-cum-fertilizer drill assessed for sowing of wheat by KVK, Sidhi and Indore and for sowing of gram by KVK Katni and Kanker respectively. Sowing with this seed drill increased the yield by 30.65 per cent in wheat and 26 per cent in gram. This practice facilitates sowing with metering device at proper distance and depth, thus efficient utilization of fertilizer apart from saving in labour and time as compared to traditional practice of sowing.

Table : Performance of seed-cum-fertilizer drill for sowing and fertilizer application for wheat and gram

Details	No. of trials	Yield (q/ha)	Net return (Rs./ha)	B:C Ratio
Wheat				
Sowing by traditional tifan (Farmers' practices)	10	18.6	13514	2.34
Sowing with seed-cum-fertilizer drill (Recommended practice)		24.3	19847	2.98
Gram				
Sowing by traditional tifan (Farmers' practices)	5	10.46	17048	3.4
Sowing with seed-cum-fertilizer drill (Recommended practice)		13.22	23595	3.5

Problem identified: Time and labour intensive manual seed grading/ cleaning
Technology Assessed: Power operated grain cleaner

KVK, Indore and Mandsaur assessed Power operated and paddle operated grain cleaner for cleaning wheat. Paddle operated grain cleaner could not found suitable for the purpose because of high oscillation required for cleaning. Power operated grain cleaner performed better cleaning and cleaning capacity increased by 30 times than manual sieve cleaning.

Table : Performance of power operated grain cleaner

Details	No.of trials	Cleaning capacity (kg/hr)	Net return (Rs./ha)	BC Ratio
Manual operated grain cleaner (Farmers' practices)	10	79.5	28100	3.02
Power operated grain cleaner (Recommended practice)		656.8	31700	3.29

Problem identified: Low efficiency and more time consumption in puddling
Technology Assessed: Bullock drawn puddler

KVK, Deogarh and Boudh assessed bullock drawn puddler. Puddling helps in burring weeds in the soil and create beneficial physical condition for paddy plant growth. Such field condition could not be achieved by puddling with desi ploug (Farmers' practice). By using bullock drawn puddler 40-60 per cent labour and 60 per cent cost can be saved against desi plough with better puddled condition.

Table : Performance of bullock drawn puddler in paddy

Details	No.of trials	Field capacity ha/hr	Field capacity ha/day	Cost of operation (Rs./ha)
Puddling with indigenous plough (Farmers' practices)	10	0.04	0.30	2100
Puddling with Bullock drawn puddler (Recommended practice)		0.10	0.75	840

Problem identified: Low yield due to inadequate field preparation and costly & lengthy process of seed bed preparation.

Technology Assessed: Field preparation by Rotavator

For field preparation Rotavator was assessed by KVK, Ashoknagar for Gram crop and Gwalior & Katni assessed for wheat crop. Operation of rotavator helps in burrying the crop residue in the soil and preparation of fine seed bed. Rotavator has curved blades and their rotary action cut the soil layer alongwith plant residue several times, thus, soil pulverized very well. Rotavator prepare leveled field with fine seed bed. Field preparation by Rotavator enhanced gram yield by 12 per cent and wheat yield by 8 per cent.

Table : Performance of rotavator in field preparation

Details	No.of trials	Gram Yield q/ha	Wheat Yield q/ha	Net Return (Rs./ha)	BC Ratio
Field preparation by cultivator and harrow (Farmers' practices)	15	12.5	40.27	31523	3.8
Field preparation by Rotavator (Recommended practice)		14.0	43.52	39739	4.6

Problem identified: Low yield due to improper placement of seed in wheat/ gram / broadcasting of mustard / proper implement for sowing soybean with intercrop

Technology Assessed: Seed drill

Seed drill has been assessed by KVK, Ashoknagar and Mandsaur for intercropping in soybean crop, KVK, Janjgir and Bilaspur for Wheat sowing and KVK Mandsaur for line sowing of mustard. It has optimized plant population in soybean, increased number of tiller in wheat by 47%. Field coverage by tractor drawn seed drill was 0.18 ha/hr which is almost 13 times to bullock drawn sowing.

Table : Performance of seed drill

Details	No.of trials	Soybean Yield q/ha	Wheat Yield q/ha	Mustard Yield q/ha	Net Return (Rs./ha)	BC Ratio
Sowing of soybean/ wheat/gram by Tifan/ behind plough and broadcasting in mustard (Farmers' practices)	21	14.07	19.87	20.33	19443	2.7
Sowing with seed cum fertilizer drill (Recommended practice)		18.04	25.72	17.24	26117	3.2

Problem identified: More time and labour consuming in manual harvesting

Technology Assessed: Self propelled reaper

KVK, Indore and Mandsaur assessed self propelled reaper for harvesting soybean and chandrasoor respectively. Labour (man-hr/ha) requirement reduced from 70 to 5.5 while cost of operation reduced from Rs. 2937 to 1984. Thus, self propelled reaper increased harvesting capacity by 12 times and reduced cost by 50 per cent.

Table : Performance of self propelled reaper in chandrasoor

Details	No.of trials	Field capacity Soybean ha/hr	Field capacity Chandrasoor ha/hr	B:C Ratio
Harvesting manually (Farmers' practices)	5	0.014	0.014	2.75
Self propelled reaper (Recommended practice)		0.17	0.18	3.12

Problem identified: Low efficiency and high drudgery in making ridges using spade.
Technology Assessed: Hand ridger

KVK, Boudh, Deogarh, Ganjam and Raisen assessed Hand ridger for ridge making and other soil manipulation work. Labour requirement with hand ridger operation reduced by 20 per cent. It also helps in reducing drudgery in farm women for ridge formation and other soil manipulation works.

Table : Performance of hand ridger

Details	No.of trials	Field capacity ha/man-day	BC Ratio
Manually by spade/ sickle (Farmers' practices)	21	0.08	2.63
Hand ridger (Recommended practice)		0.21	2.8

Problem identified: High drudgery in weeding by farm women & Scarcity of labour
Technology Assessed: Wheel finger weeder

KVK, Gajpati and Sundergarh assessed wheel finger weeder for weeding in vegetable fields by women. Labour requirement with wheel finger weeder reduced by 55%. It also helps in reducing drudgery in farm women for vegetables.

Table : Performance of wheel finger weeder in vegetables

Details	No.of trials	Field capacity ha/man-day	BC Ratio
Manually by sickle (Farmers' practices)	10	0.05	2.6
Wheel finger weeder (Recommended practice)		0.09	3.5

9. Drudgery Reduction

Problem identified: High drudgery and low efficiency of farm women involved in cleaning and grading of seeds.

Technology Assessed: Assessment of hanging sieve for drudgery reduction and efficiency enhancement of farm women during cleaning and grading of seeds.

Cleaning and grading of seeds by hanging sieve was undertaken for assessment by 4 KVKs namely Khandwa, Chhindwara, Burhanpur and Narsinghpur under 20 trials. Manual cleaning of seeds takes too much time as well as sitting and bending posture causes muscular disorders. Hanging sieve is hanged with waist line size and farm women done grading in standing position. Result indicated 21 per cent reduction in drudgery with 259.09 per cent increase in efficiency of farm women. It reduced labour cost of Rs. 75 per q of seeds. This practice saved more than half the time of farm women with an average saving of labour cost by 70 per cent.

Table : Performance of Hanging Sieve for Cleaning and Grading of Seeds

Technology Option	No. of Trials	Output (Kg/hr)	Drudgery reduction %	Increase in Efficiency %	Labour cost (Rs/q)
Manual cleaning (Farmers' practices)	**20**	**27.50**	**-**	**-**	**125**
Use of Hanging sieve (Recommended practice)		98.75	21	259.09	50

Problem identified: High drudgery and low efficiency of farm women involved in weeding operation.

Technology Assessed: Assessment of drudgery reduction in weeding in crops through wheel hoe.

Weed control is a major problem for farmers/ farm women. Generally farm women do control the weeds using hand tools like sickle, khurpa and so on. It is very demanding of labour and full of drudgery. KVK Burhanpur, Dewas, Narsinghpur (Madhya Pradesh) and Mahasamund, Kanker (Chhattisgarh) assessed the wheel hoe for intercultural operations and found that it saved almost half the time of farm women with an increase in working efficiency of 51.69 per cent and 22.50 per cent drudgery reduction over traditional practices. The weed intensity was also found to reduce by 34.78 per cent.

Table: Performance of wheel hoe

Technology Option	No. of Trials	Output (sq.m./hr)	Drudgery reduction%	Weed intensity /m2
Local sickle (Farmers' practices)	24	96.25	-	34.5
Wheel hoe (Recommended practice)		146.00	22.50	22.5

Problem identified: More drudgery and time consuming by manual decortication of groundnut by women.

Technology Assessed: Assessment of groundnut decorticator for drudgery reduction.

KVK Sambalpur conducted trial on decortications of groundnut by groundnut decorticator and found 18.5 per cent reduction in drudgery and up to 143.48 per cent increase in efficiency.

Table : Performance of groundnut decorticator

Technology Option	No. of Trials	Output (Kg/hr)	Drudgery reduction %	Increase in Efficiency %
Manual cleaning (Farmers' practices)	5	12.65	-	-
Use of groundnut decorticator (Recommended practice)		30.8	18.5	143.48

Problem identified: Low efficiency and high drudgery of farm women during paddy weeding.

Technology Assessed: Assessment of Cono weeder for drudgery reduction of farm women during paddy weeding.

KVK Mandla of Madhya Pradesh and Gajapati of Odisha assessed the Cono weeder during paddy weeding. The result of this OFT showed that the use of cono weeder increased efficiency by 10.2 per cent as compared to traditional practice. The net return was also increased by 45.19 per cent.

Table : Performance of Cono weeder

Technology Option	No. of Trials	Output (sq.m./hr)	Cost (Rs./ha)	Net Return (Rs.)
Manual (Farmers' practices)	10	49	15355	13458
Cono weeder (Recommended practice)		54	16850	19540

10. Small Scale Income Generating Enterprises

Problem identified: Low income and unavailability of quality mushroom.

Technology Assessed: Assessment of performance of mushroom production technologies

KVK Bhatapara (Chhattisgarh), Mandla (Madhya Pradesh) and Jajpur & Ganjam (Odisha) assessed the improved mushroom production technologies including low cost poly house technology and improved varieties. Cost of input of 30 bags was incurred as Rs. 280, the product was sold with Rs. 1250. Thus farmer received Rs. 970 as net profit.

Table: Performance of mushroom production technology

Technology Option	No. of Trials	Production (Kg/Bag)	Net return (Rs/ 30 Bag)
Lack of knowledge about edible mushroom (Farmers' practices)	17	-	-
mushroom production technology (Recommended practice)		2.10	970

Problem identified: Lack of well decomposed organic manure which increases the cost of plant nutrition and production

Technology Assessed: Assessment of vermicompost production technology

The farmers are using organic manure, which is prepared through improper methods. This not only creates the problem of weeds but also helped the pest incidence in crops. If farmers use the chemical fertilizers the cost of production was increased. In this situation the use of vermicompost may be prove better. KVKs namely Kandhamal (Odisha), Dewas, Harda, Sagar and Rewa (Madhya Pradesh) conducted 41 trials on vermin-compost preparation. The results that an average production of 55.05 q per unit per can be obtained with 5.44 kg earthworm per unit in the same period.

Table: Assessment of Performance of Backyard Nutritional Garden

Technology Option	No. of Trials	Production (q/unit/m)	Earth worm production (kg/unit/m)
Unplanned and no gardening (Farmers' practices)	41	-	-
Plan round the year availability of nutritive vegetables and Fruits in the garden (25 x 10 m) (Recommended practice)		55.04	5.44

11 Nutritional Garden

Problem identified: Food and nutritional insecurity of farm women due to unavailability of functional fruit and vegetables at household level.

Technology Assessed: Assessment of backyard nutritional garden for nutritional security.

The kitchen gardening is an imperative tool of our daily life. The main aim of kitchen, home, or nutritional vegetable garden is to meet the daily requirements of family all the year round with, fresh vegetables rich in nutrients and energy. Kitchen gardening plays an important role in increasing vegetable production and to provide balanced nutrition to all classes of society. KVKs namely Guna, Bhind, Katni, Rewa and Chhindwara of Madhya Pradesh conducted 31 trials on backyard nutritional gardening and result showed saving of Rs 2520 per family per year.

Table: Assessment of Performance of Backyard Nutritional Garden

Technology Option	No. of Trials	Yield (Kg/plot)	Net Returns (Rs/unit)
Unplanned and no gardening (Farmers' practices)	31	-	-
Plan round the year availability of nutritive vegetables and Fruits in the garden (25 x 10 m) (Recommended practice)		356	2520

12. Animal Disease Management

Problem identified : High incidence of mastitis in cross bred / high yielding dairy animals resulting in loss in milk production

Technology assessed : Assessment of prophylactic practice spray of antiseptic (Vircons)

KVK Indore assessed the prophylactic majors for mastitis (spray of antiseptic (Vircons) resulting resulted in 98 per cent reduction in cases of subclinical mastitis in dairy animals and 28.67 per cent increase in returns.

Table : Performance of Virocon antiseptic spray in control of subclinical mastitis.

Technology Option	No. of trials	Disease incidence (%)	Avg. Net Returns (Rs.)	B.C. Ratio
Poor prophylactic majors for mastitis (No practice of cleaning of udder and regular testing of subclinical mastitis (Farmers' practices)	5	45	10810	1.57
Spray of antiseptic (Vircons) after milking i.e. cleaning of udder prior after milking and supplementation of vit. E for control of subclinical mastitis (Recommended practice)		0 - 5	13910	1.66

Problem identified : Low production and profitability due to high incidence of endo-parasite in calves and adult animals.

Technology assessed : Management of calf mortality and low milk production by adopting de-worming schedule and maintaining hygienic condition in the farm.

KVK Raisen, Jagatsinghpur, Burhanpur, Indore, Sehore and Sagar conducted OFT on assessment of broad spectrum antihelmentic drug which results in 68 per cent reduction in calf mortality and 53.68 per cent increase in average milk yield.

Table : Performance of broad spectrum antihelmentic drug on calf mortality and milk production.

Technology Option	No. of trials	Avg. Milk yield (lit./03 mth)	Calf mortality (%)	B.C. Ratio
Do not follow the de-worming schedule occasionally provide deworming medicine (Farmers' practices)	51	326	52.8	1.18
Follow up de-worming schedule by broad spectrum antihelmentic drug i.e. de-worming before and after monsoon and follow schedule of de-worming calf. (Recommended practice)		501	16.8	2.22

Problem identified : Low production and poor body condition score due to infestation of endo parasites (nematodes, cestodes and hook worms) and ecto parasites (tick, mites, lice etc.)

Technology assessed : Management of ecto and endo parasite by composite drug (antihelmentic and acaridae)

KVK Ratlam, Khandwa, Mandsaur, Katni, Badwani, Jhabua, Sehore, Narsinghpur and Gwalior conducted OFT on assessment of composite de-wormer for the management of ecto and endo parasite in cow and buffaloes which results in reduction of incidence of endo parasite by 85 per cent and ecto parasite by 75 per cent with increase in milk production by 23.80 per cent.

Table: Performance of composite drug (IVERMECTINE) for ecto and endo parasite management

Technology Option	No. of trials	Avg. Milk yield (lit./day)	Incidence of endo parasite (%)	Incidence of ecto parasite (%)
Farmers follow drug to control endo & ecto parasite separately and that to occasionally. (Farmers' practices)	83	4.2	80	20
Control of ecto and endo parasite combined by one composite drug (IVERMECTINE) (Recommended practice)		5.2	12	05

Problem identified : Low production and profitability due to Increase incidence of prolonged postpartum heat and anoestrus due to poor feeding (i.e. deficiency of essential mineral mixture, vitamin and amino acids) in cross bed cattle.

Technology assessed : Management of prolonged postpartum heat and anoestrus problem in cross bed cattle by de-worming followed by supplementation of essential mineral mixture, vitamins and amino acids.

KVK Katni, Narsinghpur and Mandsaur conducted OFT on assessment of de-worming followed by minerals mixture, vitamins and amino acid on reproductive performance in cross bed cattle in which 60 per cent become cyclic and got inseminated within 93 days of service period whereas 8 per cent controlled animals came into Heat within 121 days of service period.

Table : Performance of minerals mixture, vitamins and amino acids on management of prolonged postpartum heat and anoestrus problem.

Technology Option	No. of trials	% of animal in estrous	Service period	B.C. ratio
Do not take care after calving on balance feeding of the cross bed cattle. (Farmers' practices)	20	8	121	2.1
After parturition follow de-worming and supplementation of essential mineral mixture, vitamins and amino acids in the ration of the cross bed cattle for 03 months (Recommended practice)		60	93	2.8

13. Animal Feed Management

Problem identified : **Low milk yield and profitability due to lack of protein and low dietary energy intakes**

Technology assessed : **Assessment of feeding bypass fat and protected protein.**

KVK Khandwa conducted OFT on Feeding bypass fat and protected protein resulting in increase avg. milk yield by 13.43 per cent and 33.3 per cent increase in net return.

Table : Performance of bypass fat and protected protien

Technology Option	No. of trials	Avg. Milk Yield (lit./day)	Net Return (Rs.)
No feeding of bypass fat and protected protein in the ration	10	6.7	81.6
Feeding of formaldehyde treated bypass protein and bypass fat @ 100 gm each / animal / day		7.6	108.8

Problem identified : **Low productivity and profitability due to poor feeding i.e. imbalance concentrate mixture having deficient mineral ration.**

Technology assessed : **Assessment of supplemention of ration with minerals and vitamins.**

KVK Badwani, Datia, Satna and Umaria assessed the mineral mixture and vitamins in the ration of desi milch cow and buffaloes resulting increase in avg. milk yield by 51 per cent and 47.8 per cent increase in net return.

Table : Performance of mineral mixture and vitamins on milk production in dairy animals.

Technology Option	No. of trials	Avg. Milk yield (lit./day)	Net Return (Rs.)	B.C. Ratio
No feeding of vitamin and mineral mixture in the ration. (Farmers' practices)	21	4.10	13012	2.49
Mineral Mixture @ 30g/day/animal for 03 months (Recommended practice)		6.22	19242	3.1

Problem identified : **Low productivity and profitability due to poor feeding management i.e. imbalance ration with poor quality feeds and fodder.**

Technology assessed : **Assessment of Balance feeding with quality fodder and supplements.**

KVK Ratlam, Shivpuri, Badwani, Sidhi and Jagatsinghpur conducted OFT on balance feeding in cross bed cows and upgraded buffaloes resulting in increase avg. milk yield by 21 per cent and 43.59 per cent increase in net return.

Table : Performance of mineral mixture and vitamins in the ration.

Technology Option	No. of trials	Avg. Milk yield (lit./day)	Net Return (Rs.)	B.C. Ratio
imbalance feeding with poor quality green fodder and no minerals and vitamins in the ration (Farmers' practices)	20	5.02	8390	2.96
5 kg wheat straw + 15 kg G.F. + 6 kg concentrate (B.C.F.) + 50 gm mineral mixture (Recommended practice)		6.1	12048	3.18

Problem identified : Low milk production and profitability due to high fiber diet, deficiency of essential minerals and enzymes in the ration.

Technology assessed : Assessment of yeast culture, fibrolytic enzymes, prebiotics and azolla in the ration of the milch animal

KVK Khandwa, Katni, Khurda, Raigada and Bargarh conducted OFT on assessment of yeast culture, fibrolytic enzymes, prebiotics and azolla in the ration resulting in increase avg. milk yield by 12.5 per cent and 25 per cent increase in net return.

Table : Performance of yeast culture, fibrolytic enzymes, prebiotics and azolla in milk production.

Technology Option	No. of trials	Avg. Milk yield (lit./month)	Net Return (Rs.)	B.C. Ratio
No use of Yeast culture, fibrolytic enzymes and prebiotics in the ration (Farmers' practices)	60	240	6000	2.30
Yeast culture, fibrolytic enzymes, prebiotics and azolla in the ration (Recommended practice)		270	7500	2.85

Problem identified : Low productivity and profitability due to non availability of quality greens feed and fodder.

Technology assessed : Assessment of quality green fodder production and impact on milk production.

KVK Angul, Jhauba, Balasore, Nayagarh and Chhatarpur conducted OFT on green fodder production of hybrid napier (CO-3), berseem and Oat impact on milk production resulting in avg. milk yield by 28.7 per cent and 112 per cent increase in fodder production.

Table: Performance of quality fodder production and impact on milk production

Technology Option	No. of trials	Avg. Milk yield (lit./day)	Fodder production (qtl./ha)	B.C. Ratio
Local variety poor quality fodder production and feeding. (Farmers' practices)	17	6.3	20.16	1.8
Hybrid napier (CO-3), Berseem (J.B.-5) & Oat with recommended practices and feeding (Recommended practice)		8.1	42.82	2.9

Problem identified : **Low production and profitability during drought period (April to July) due to unavailability of greens and low plane ration.**

Technology assessed : **Assessment of Urea molasses mineral block (UMMB) feeding in production and reproduction during the drought period.**

KVK Ratlam conducted OFT on assessment of Urea molasses mineral block (UMMB) feeding during the drought period resulting in increase avg. milk yield by 17.30 per cent and 29.78 per cent increase in net returns.

Table : Performance of Urea molasses mineral block (UMMB) feeding on milk production during the drought period.

Technology Option	No. of trials	Avg. Milk yield (lit./day)	Net Returns (Rs.)	B.C. Ratio
Feeding only dry no greens during the drought period. (Farmers' practices)	10	5.2	3384	1.67
Feeding dry along with 300 gm UMMB/day/animal x 03 months (Recommended practice)		6.1	4392	1.80

Problem identified : **Farmers shows lack of interest in group formation**

Technology assessed : **Formation of farmers interest group (FIGs) for dairy farming.**

KVK Badwani conducted OFT on Assessment of the effect of group approach through Farmers Interest Group (FIGs) in dairy farming.

Table : The effect of group approach through farmers interest group (FIGs)

Technology Option	No. of trials	Avg. Milk yield (lit./lac.)	Avg. Net Returns (Rs.)	B.C. Ratio
Un organized group approach (Farmers' practices)	10	1198	9121	1.59
Group approach through Farmers Interest Group (FIGs) (Recommended practice)		1220.70	12544	1.7

14. Poultry Production

Problem identified: Low income of Farm women due to low productivity of local breed.

Technology assessed: Assessment of improved dual purpose brid in free range (backyard poultry system)

KVK Raisen, Khurda, Satna, Umaria, Koraput, Rajnandgaon, Angul, Deogarh, Sheopur and Sheore conducted OFT on Assessment of Improved dual purpose brid (Black rock, Krishna J, Synthetic color, Vanaraja, Cary – Devendra, Red Cornish and Shanker Kadaknath) in backyard free range system results in increase in avg. body wt. by 61.5 per cent and eggs by 64.5 per cent with net return by 76.3 per cent.

Table : Performance of improved dual purpose bird in backyard free range system.

Technology Option	No. of trails	Weight (kg./year)	Avg. No. of egg./year	Return (Rs.)
Local colored bird (poor in egg and meat production) (Farmers' practices)	191	1.3	62	466
improved dual purpose color bird (i.e. Black rock, Krishna J, Synthetic color, Vanaraja, Cary – Devendra, Red Cornish and Shanker Kadaknath) (Recommended practice)		2.1	102	822

Problem identified: Mortality and poor body growth of broiler in deep litter system due to poor feeding management resulting in low production and profitability.
Technology assessed: Assessment of balance feeding with probiotic additive to control mortality and body growth of broilers.

KVK Katni and Guna conducted OFT on assessment of balance feeding with probiotic additive to control mortality and body growth of broilers results in increase in body wt. by 66.6 per cent and reduction in mortality by 75 per cent.

Table : Performance of balance feeding with probiotic additive to control mortality and body growth of broilers

Technology option	No. of trials	Body Weight (kg./year)	Mortality (%)	B.C. Ration
Broiler raising without balance feeding and proper care. (Farmers' practices)	10 (250 bird)	1.5	20	2.3
Balance feeding with probiotic additive and proper health care. (Recommended practice)		2.5	5	2.94

15. Goatary

Problem identified: Poor body growth and kid mortality due to infestation of endo parasites (nematodes, cestodes and hook worms) resulting in low production and profitability.
Technology assessed: Regular De-worming with broad spectrum antihelmentic drug.

KVK Sagar, Jhabua, Khurda, Angul, Burhanpur and Jharsuguda conducted OFT on regular de-worming with broad spectrum antihelmentic drugs which resulting in increase in 23 per cent body weight and reduction in kid mortality by 75 per cent.

Table : Performance of regular de-worming with antihelmentic drug.

Technology Option	No of trials	Body wt. (Kg) at 1 year age	Kid mortality (%)	B:C Ration
No follow up the regular de-worming schedule. (Farmers' practices)	221	23.40	20	3.3
Follow up the regular de-worming schedule with broad spectrum drugs (Fenbendazole,		28.80	5	4.0

Albendazole and Piperzine) (Recommended practice)				

Problem identified: Low return in goatry due to rearing of local non descript breeds.

Technology assessed: Assessment of performance of improved breeds of goat for meat production

KVK Khurda conducted OFT on Assessment of Beetal bucks for up gradation of non-descript goats which result in increase in body wt. by 51.66 per cent and net return by 54.62 per cent.

Table: Performance of up-gradation of local breed by beetal buck.

Technology Option	No of trials	Body wt. (kg)	Net Return
Rearing of local non descript breeds (Farmers' practices)	3	12.00	1620
Beetal bucks for up gradation of non-descript goats (Recommended practice)		18.20	2505

Problem identified: Low Production and profitability in goat due to imbalance and poor feeding management.

Technology assessed: Assessment of Feeding homemade balance concentrate on body wt. growth and milk production in goat.

KVK Ratlam and Satna conducted OFT on assessment of feeding home made balance concentrate on body wt. growth in goat, which results in increase in boby wt. by 50 per cent, milk yield by 75 per cent and net return by 54.27 per cent.

Table: Performance of home made balance concentrate on body wt. growth

Technology Option	No. of trials	Avg. Body wt. (kg) 3 month	Avg. milk yield (lit./day) 3 months	Net returns (Rs)
Free range grazing and feeding imbalance concentrate and available greens. (Farmers' practices)	20	8	1.2	1345
Feeding recommended balance concentrate mixture and greens along with free range grazing. (Recommended practice)		12	2.1	2075

16. Fishery

Problem identified: Disease outbreak in bottom fishes because of poor decomposition and deposit of sludge in pond bottom during winter that releases obnoxious gases and exerts environmental stress to fishes.

Technology Assessed: Assessment of Geolite application for pond bottom sluge amelioration during winter in carp culture

KVK Bhadrak assessed the Geolite application for pond bottom sluge amelioration during winter in carp culture and the results showed an increase of 44.11 per cent in fish yield over

local farmers practices. The net return and BC ratio were also found to be higher by 25.18 per cent and 22.92 per cent respectively.

Table : ITK in Control of Winter Fish Diseases

Technology Option	No. of trials	Yield (q/ha)	Net return (Rs/ha)	BC Ratio
Local practices for disease control in fish culture (Farmers Practices)	5	13.15	28400	2.88
Geolite application for pond bottom sluge amelioration during winter in carp culture (Recommended practices)		18.95	35550	3.54

Problem identified: Less production of various types of fishes using local practices including ornamental fishes.

Technology Assessed: Assessment of composite, poly and ornamental fish culture

KVK Korba (Chhattisgarh), Dewas (Madhya Pradesh) and KVK Kendrapara, Nuapada, Gajapati, Khurda, Puri, Ganjam, Balasore and Sonepur (Odisha) assessed the composite culture with Labeo fimbriatus, polyculture and breeding of live bearer (Molli) for ornamental fish culture, which resulted in increase overall fish production by 40.60 per cent, while in net income was increased by Rs 40540 per ha with 38.36 per cent increase in BC ratio.

Table : Assessment of composite fish production

Technology Option	No. of trials	Yield (q/ha)	Net return (Rs/ha)	BC Ratio
Non practicing of composite/ poly / ornamental fish culture (Farmers Practices)	60	56.33	53088	2.234
Assessment of composite, poly and ornamental fish culture (Recommended practice)		79.20	93628	3.091

3. Frontline Demonstrations

Frontline demonstration is conducted to demonstrate the superiority of frontier and location specific proven technologies of agriculture and allied area among the farming community and extension functionaries for up-scaling in the larger area as well as for generating the production data along with the feedback. During the reporting year, a total number of 7735 FLDs were conducted on crops including oilseeds, pulses, cereals, vegetables crops, cash crops, agro forestry, millets and other important area covering the total area of 5192.46 ha in Zone VII (Table 3.1). In addition, 5234 demonstrations were also conducted on some of the important income generating enterprises like poultry, goatery, duckery, farm machinery, mushroom units vermicompost, etc. though 1618 units (Table 3.2).

Table 3.1: State-wise area and no. of FLDs on crop in zone during 2011-12

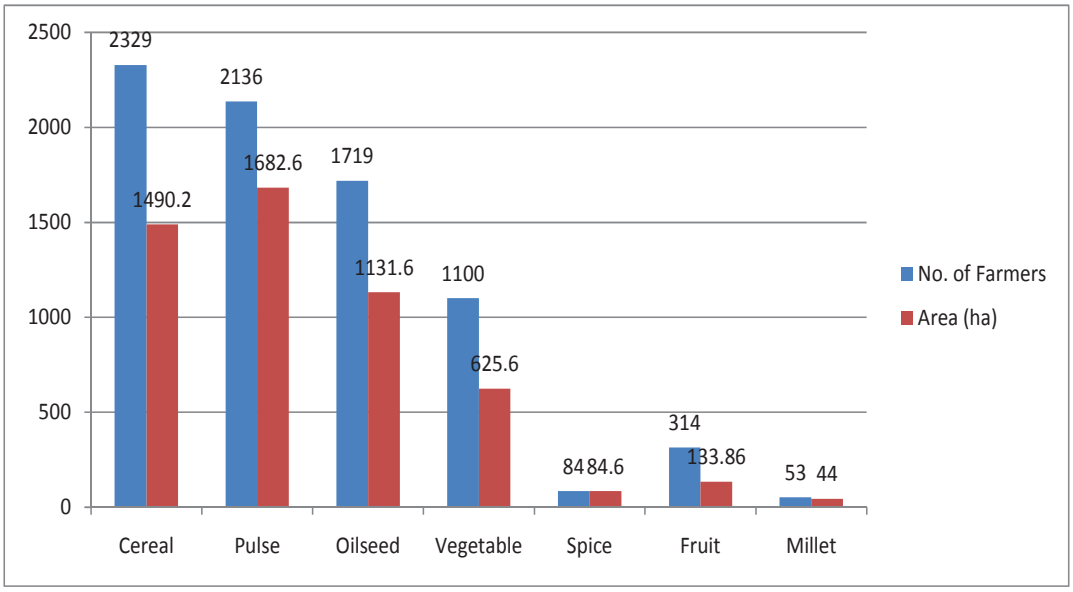
Category	Chhattisgarh		Madhya Pradesh		Odisha		Zone	
	No. of Farmers	Area (ha)	No. of Farmers	Area (ha)	No. of Farmers	Area (ha)	No. of Farmers	Area (ha)
Cereal	530	343.2	909	617	890	530	2329	1490.2
Pulse	512	489.2	870	683.2	754	510.2	2136	1682.6
Oilseed	460	349.2	684	412.2	575	370.2	1719	1131.6
Vegetable	375	195.2	410	225.2	315	205.2	1100	625.6
Spice	22	22.2	34	34.2	28	28.2	84	84.6
Fruit	98	44.25	121	56.36	95	33.25	314	133.86
Millet	15	15	20	20	18	14	53	44
Total	**2012**	**1458.25**	**3048**	**2048.16**	**2675**	**1691.05**	**7735**	**5192.46**

Table 3.2: State-wise FLDs conducted on enterprises by KVKs in zone during 2011-12

S. No.	Category	Chhattisgarh		Madhya Pradesh		Odisha		Zone	
		No. of Farmers	No. unit/Area	No. of Farmers	No. unit/ Area	No. of Farmers	No. unit/Area	No. of Farmers	No. unit/ Area
1	Animal Husbandry & Fisheries								
	Dairy	0				23	4.15	**23**	**4.15**
	Buffalo	0		150	30			**150**	**30**
	Goatary	0		50	10	85	17	**135**	**27**
	Duckery	0				75	15	**75**	**15**
	Cattle	0		430	86			**430**	**86**
	Poultry Production	0		25	5	1000	200	**1025**	**205**
	Total	**0**	**0**	**655**	**131**	**1183**	**236.15**	**1838**	**367.15**
2	Farm Mechanization/ Drudgery reduction								
	Farm Mechanization / Drudgery reduction	0	0	265	53	470	94	735	147
3	Small scale income generating activities								
	Bee Keeping	0	0	0	0	75	15	**75**	**15**
	Lac production	0	0	0	0	50	10	**50**	**10**
	Mushroom	225	45	0	0	2864	1145	**3089**	**1190**
	Vermi compost	0	0	10	2	160	32	**170**	**34**

	Total	225	45	10	2	3149	1202	3384	1249
4	Compost production								
	Compost Making	-	-	-	--	-	-	-	-
5	Nutritional Security								
	Nutritional garden	5	1	0	0	7	1.3	12	2.3
	G.Total	**230**	**46**	**701**	**133**	**4339**	**1439.45**	**5234**	**1618.45**

Fig. 3.1: FLD conducted on cereals, pulses, oilseed, and horticultural crops in the zone



4. Training Organized

Training has been considered a key component for updating the knowledge and imparting the new skill to the participants. There was great emphasis on the organizing trainings both for the farmers as well as for the trainers so that equilibrium could be maintained in the KVKs. Data shows the significant increase in the number of trainings and participants. In total, 10847 courses benefitted to 260452 participants including farmers and farm women, rural youth, extension personnel and sponsored from different agencies given in Table 3.1.

Table 3.1: State wise, category wise training programmes conducted by the KVKs in Zone VII during 2011-12

Type	No. of courses				Participants			
	CG	MP	Odisha	Zone VII	CG	MP	Odisha	Zone VII
Farmers & Farm Women	1268	5229	2247	8744	44235	120422	50854	215511
Extension personnels	102	481	269	852	3165	12340	4769	20274
Rural youth	153	636	462	1251	5595	12278	6794	24667
Total	**1523**	**6346**	**2978**	**10847**	**52995**	**145040**	**62417**	**260452**

Table 3.2: Training for farmers and farm women including sponsored training programmes by the KVKs in Zone VII during 2011-12

Major theme	No	SC			ST			Others			Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Crop Production	1657	4808	1365	5525	10117	3028	11408	23143	3650	26673	38068	8043	46111
Horticulture – Vegetable Crops	498	1166	457	1348	2036	808	2365	6149	1328	7477	9351	2593	11944
Horticulture-Fruits	443	1490	477	1713	1950	917	2452	5695	1206	6901	9135	2600	11735
Horticulture-Ornamental Plants	78	190	52	189	158	121	236	685	185	870	1033	358	1391
Horticulture-Tuber crops	32	65	30	95	338	147	481	149	184	333	552	361	913
Horticulture-Spices	140	286	49	304	407	125	522	1081	173	1254	1774	347	2121
Horticulture-Medicinal and Aromatic Plants	34	66	36	93	228	13	191	526	90	616	820	139	959
Soil Health and Fertility Management	1035	2870	682	3102	3975	1098	4544	12636	1879	14415	19481	3659	23140
Livestock Production and Management	507	893	388	1145	1432	834	2109	4967	1408	6375	7277	2657	9934
Home Science/Women empowerment	905	1310	2412	3263	1765	3755	4527	4494	8403	12865	7569	14570	22139
Agril. Engineering	613	1364	447	1537	2036	683	2289	4957	1431	5938	8357	2561	10918
Plant Protection	884	2186	615	2412	4451	1121	4787	11794	1786	13511	18431	3522	21953
Fisheries	293	748	466	1086	745	517	1153	3646	1537	5183	5139	2520	7659
Production of Inputs at site	451	1013	449	1342	1680	572	2014	3956	1215	5171	6649	2236	8885
Agro-forestry	131	411	62	365	504	201	543	1681	197	1878	2596	460	3056

Major theme	No	SC			ST			Others			Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Others	526	1583	1019	2421	3182	2956	5741	6794	4111	10880	11559	8086	19645
Total	**8744**	**21835**	**9437**	**27557**	**37432**	**17888**	**48401**	**98435**	**30472**	**128111**	**157687**	**57824**	**215511**

Table 3.3 : Training for Rural Youths including sponsored training programmes by the KVKs in Zone VII during 2011-12

Thematic area	No	SC			ST			Other			Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Bee-keeping	32	44	18	51	94	45	139	243	68	311	381	131	512
Bio-control of pests and diseases	6	1	0	1	10	0	10	15	2	17	26	2	28
Care and maintenance of farm machinery and implements	1	1						5			6	0	6
Cold water fisheries	7	24	15	39	24	18	42	59	81	140	107	114	221
Composite fish culture	7	18	14	32	26	20	46	61	43	104	105	77	182
Cropping System	1	3	0	3	0	0	0	3	0	3	6	0	6
Dairy management	1				25			0	0	0	25	0	25
Dairying	35	48	38	79	66	51	117	247	64	311	361	153	514
Design and development of low/minimum cost diet	3	0	5	5	2	12		13	16	29	15	33	48
Designing and development for high nutrient efficiency diet	1	0	4	4	0	0	0	0	5	5	0	9	9
Disease management	1	0	0	0	0	0	0	20	0	20	20	0	20
Entrepreneurial development of farmers/youths	12	30	1	30	8	4	10	132	47	179	170	52	222
Financial linkage and planning for FIGs &BIGs	1				4	2	6	7	5	12	11	7	18
Fish fry and fingerling rearing	8	21	13	34	69	24	93	58	37	95	148	74	222
Fish harvest and processing technology	6	42	15	57	29	15	41	80	43	123	151	73	224
Fishery Production	40	53	38	74	60	18	66	234	125	359	347	181	528
Fodder production	3	12	2	2	5	5	5	13	23	36	30	30	60
Formation and management of SHGs	6	20	2	22	3	3	6	67	19	86	90	24	114
Fruit production, management and processing technologies	97	129	47	132	121	66	147	626	146	772	876	259	1135
Gender mainstreaming through SHGs	3	1	0	1	9	0	9	41	10	51	51	10	61
Goatry Management	1	9			6			0	0	0	15	0	15
Group Dynamics and farmers organization	2	16	0	16	3	0	3	20	0	20	39	0	39
Household food security by kitchen gardening and nutrition gardening	3	5	3	8	29	10	39	37	5	42	71	18	89
Income and employment generation	16	30	10	34	38	12	48	164	51	215	232	73	305
Income generation activities for empowerment of rural Women	28	36	62	95	50	63	110	158	176	334	244	301	545
Income Generation Activity	5		15			4		0	113	22	0	132	132
Information networking among farmers	3	0	3	0	0	3	0	32	32	64	32	38	70
Integrated Crop Management	86	142	94	207	235	142	358	877	222	1099	1254	458	1712
Integrated Farming	36	65	23	80	140	33	119	239	219	458	444	275	719
Integrated Farming Systems	3	4	0	2	6	0	3	20	2	22	30	2	32
Lac cultivation	12	31	12	43	101	14	108	106	29	135	238	55	293

Thematic area	No	SC			ST			Other			Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Leadership development	3	7	0	7	0	0	0	34	1	35	41	1	42
Location specific drudgery reduction technologies	2	2	0	0	15	0	15	22	4	26	39	4	43
Mushroom Production	69	186	76	236	132	145	240	889	364	1253	1207	585	1792
Nursery management	2				25			6	0	0	31	0	31
Nursery Management of Horticulture crops	35	89	61	121	119	93	185	300	156	456	508	310	818
Nursery raising	2	0	0	0	0	0	0	1	14	15	1	14	15
Organic manures production	91	150	46	173	299	111	372	680	350	1030	1129	507	1636
Ornamental fisheries	9	20	11	27	67	51	107	71	35	106	158	97	255
Others	112	294	71	318	512	260	663	1161	453	1614	1967	784	2751
Para extension workers	6	12	15	27	20	11	31	34	74	108	66	100	166
Para vets	8	37	9	46	22	9	31	130	28	158	189	46	235
Pearl culture	7	37	12	49	62	20	82	77	34	111	176	66	242
Piggery	6	19	9	28	44	9	49	78	30	108	141	48	189
Plant propagation techniques	1				4			6	0	6	10	0	10
Planting material production	3	4	1	2	45	1	19	18	2	10	67	4	71
Post Harvest Technology	13	24	20	44	71	39	107	78	176	254	173	235	408
Poultry production	30	56	38	94	170	96	266	207	60	267	433	194	627
PRA	2	2	0	2	4	0	4	9	0	9	15	0	15
Prawn culture	9	34	15	31	31	18	37	59	50	109	124	83	207
Processing and value addition	64	142	115	250	111	394	456	338	578	902	591	1087	1678
Production and Management technology	12	3	0	3	19	9	19	78	11	89	100	20	120
Production of low volume and high value crops	24	5	8	10	28	39	50	81	80	161	114	127	241
Production of organic inputs	4				95			5	0	5	100	0	100
Production of quality animal products	7	21	16	37	45	14	59	110	48	158	176	78	254
Production technologies	3	2	0	2	0	0	0	28	0	28	30	0	30
Propagation techniques of Ornamental Plants	33	10	18	21	2	18	8	84	44	128	96	80	176
Protective cultivation (Green Houses, Shade Net etc.)	12	22	30	40	27	16	43	98	103	201	147	149	296
Quail farming	8	22	11	26	65	12	64	59	46	105	146	69	215
Rabbit Management	6	15	12	27	21	14	35	85	33	118	121	59	180
Repair and maintenance of farm machinery and implements	30	35	50	78	54	132	183	215	152	367	304	334	638
Rural Crafts	11	14	24	34	31	61	87	64	88	152	109	173	282
Seed production	89	111	19	107	147	18	128	510	128	638	768	165	933
Sericulture	2	13	2	6	9			10	6	16	32	8	40
Sheep and goat rearing	10	97	18	109	28	46	59	73	38	111	198	102	300
Shrimp farming	8	16	11	27	25	18	43	127	41	168	168	70	238
Skill development for avenues of self emplyment	1	0	4	4	0	24	24	0	30	30	0	58	58
Small scale processing and value addition	1	0	21	21	0	0	0	0	14	14	0	35	35
Soil and Water Conservation	1	4	2	6	0	3	3	8	0	8	12	5	17
Soil fertility management	20	28	8	29	57	16	73	229	119	348	314	143	457
Sustainable Utilization of NWFPs	1	4			21			0	0	0	25	0	25
Tailoring and Stitching	2	0	5	5	0	0	0	0	38	38	0	43	43
Value Addition	21	7	53	60	55	198	221	30	190	220	92	441	533
Water management	2				61			3	0	3	64	0	64
Women and child care	2	1	0		0	0	0	14	15	29	15	15	30
WTO and IPR issues	1	5	0	5	0	0	0	20	0	20	25	0	25
Total	**1251**	**2335**	**1245**	**3163**	**3706**	**2459**	**5288**	**9706**	**5216**	**14796**	**15747**	**8920**	**24667**

Table 3.4: Training programmes for Extension Personnel including sponsored training programmes by the KVKs in Zone VII during 2011-12

Thematic area	No	SC			ST			Other			Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Bee-keeping	3	5	0	5	8	0	8	43	4	47	56	4	60
Bio-control of pests and diseases	4	2	0	0	8	2	10	16	17	33	26	19	45
Capacity building for ICT application	2	0	0	0	20	0	0	22	1	23	42	1	43
Care and maintenance of farm machinery and implements	31	115	21	115	132	48	91	444	69	513	691	138	829
Cropping System	7	27	2	20	26	9	33	81	28	109	134	39	173
Dairy Management	10	85	10	95	41	9	27	150	35	185	276	54	330
Design and development of low/minimum cost diet	12	6	14	13	2	20	22	13	113	126	21	147	168
Disease management	4	10	12	22	14	9	23	22	31	53	46	52	98
Entrepreneurial development of farmers/youths	2	1	0	1	0	0	0	13	1	14	14	1	15
Feed management	11	26	9	35	19	35	54	203	34	237	248	78	326
Financial linkage and planning for FIGs &BIGs	1	0	1	1	0	0	0	0	11	11	0	12	12
Fishery Production	10	8	4	10	13	4	17	61	68	129	82	76	158
Formation and management of SHGs	25	66	27	86	128	34	158	270	95	365	464	156	620
Fruit production, management and processing technologies	36	29	6	35	40	5	43	239	47	286	308	58	366
Fry and fingerling rearing	1	0	0	0	2	1	3	13	4	17	15	5	20
Gender mainstreaming through SHGs		109			319	79	398	84	89	173	512	168	680
Group Dynamics and farmers organization	33	76	28	94	43	27	61	324	125	449	443	180	623
Household food security by kitchen gardening and nutrition gardening	13	37	13	46	79	18	97	128	95	223	244	126	370
Income generation activities for empowerment of rural Women	4	0	4	2	0	15	10	0	21	21	0	40	40
Information networking among farmers	19	63	31	94	70	35	103	289	80	369	422	146	568
Integrated Crop Management	117	349	82	390	482	87	432	1406	248	1654	2237	417	2654
Integrated Disease Management	5	7	2	9	13	4	17	33	16	49	53	22	75
Integrated Farming	1	2	0	2	1	0	1	11	0	11	14	0	14
Integrated Fish Farming	1					5		1	4	5	1	9	10
Integrated Nutrient Management	13	44	10	52	23	9	28	140	9	149	207	28	235
Integrated Pest & Disease Management	1	5	0	5	0	0	0	36	0	36	41	0	41
integrated Pest Management	94	217	72	243	242	73	230	976	168	1144	1435	313	1748
Lac cultivation	6	11	1	12	8	1	8	24	7	31	43	9	52
Location specific drudgery reduction technologies	7	1	4	3	4	4	8	68	52	120	73	60	133
Low cost and nutrient efficient diet designing	9	30	14	34	99	12	102	111	38	149	240	64	304
Magur culture	2	6	4	10				34	1	35	40	5	45
Mushroom production technologies	11	5	10	15	13	34	34	67	63	130	85	107	192
Nursery raising	2	11	0	11	9	1	10	16	1	17	36	2	38
Nutrient Use Efficiency	1	4	0	4	5	0	5	12	0	12	21	0	21
Nutritional Gardening	1	2	0	2	0	0	0	32	6	38	34	6	40
Organic manures production	24	83	19	89	58	24	75	177	41	218	318	84	402
Ornamental fisheries	4	18	7	25	10	0	0	50	7	57	78	14	92
Others	116	318	127	421	556	221	771	2205	536	2741	3079	884	3963
Post Harvest Technology	1	1						9	0	9	10	0	10
PRA	5	3	4	7	1	0	1	27	39	66	31	43	74

Thematic area	No	SC			ST			Other			Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Processing and value addition	24	11	37	37	13	93	103	101	251	352	125	381	506
Production and Management technology	8	33	18	44	16	8	24	71	10	81	120	36	156
Production of low volume and high value crops	1	0	0	0	0	0	0	80	5	85	80	5	85
Production technologies	34	89	15	94	119	28	140	318	80	398	526	123	649
Productivity enhancement in field crops	22	28	6	28	201	10	208	162	41	203	391	57	448
Promotion of farm machinary and power	1	0	0	0	20	0	20	50	3	53	70	3	73
Propagation techniques of Ornamental Plants	4	2	10	6	3	2	5	44	19	63	49	31	80
Protective cultivation (Green Houses, Shade Net etc.)	9	31	16	39	54	9	51	135	34	169	220	59	279
Rejuvention of old orchards	12	43	18	61	80	25	105	107	29	136	230	72	302
Rural Crafts	1	1	2	3	1	1	2	9	4	13	11	7	18
Seed Production	6	12	2	9	4	3	7	62	28	90	78	33	111
Soil fertility management	34	101	19	100	138	33	152	358	103	461	597	155	752
Storage loss minimization techniques	1	0	13	13	0			0	5	5	0	18	18
Use of ITK	1							2	10	12	2	10	12
Value addition	1	3			20			2	0	2	25	0	25
Vermi-compost production	6	12	4	16	2	3	5	72	34	106	86	41	127
Water management	8	16	0	13	15	2	17	77	48	125	108	50	158
Weed management	11	12	2	12	38	6	36	87	10	97	137	18	155
Women and child care	12	17	16	30	98	22	116	67	129	196	182	167	349
WTO and IPR issues	7	19	13	32	23	18	36	149	62	211	191	93	284
Total	**852**	**2212**	**729**	**2545**	**3333**	**1088**	**3907**	**9803**	**3109**	**12912**	**15348**	**4926**	**20274**

Several training programmes were organized by the KVKs, which were sponsored by different agencies, mainly District Project Officer, ATMA; Department of Soil Conservation; National Horticultural Mission; Department of Agriculture; Department of Animal Husbandry; Department of Forest; Department of Horticulture; National Fisheries Development Board, Hyderabad, National Seed Production Scheme of Department of Agriculture and Cooperation, NREGA, RKVY, NAIP, Bamboo mission, Tribal Development Project, etc.

Table 3.5: Details of Vocational training programmes carried out by KVKs for rural youth

Thematic area	No	SC			ST			Other			Total		
		M	F	T	M	F	T	M	F	T	M	F	T
Bee-keeping	18	36	11	35	70	10	59	205	28	233	311	49	360
Care and maintenance of farm machinery and implements	1	1						5			6	0	6
Cropping System	2	0	0	0	10	0	10	0	10	10	10	10	20
Dairy Management	6	10	0	10	8	0	8	86	6	92	104	6	110
Entrepreneurial development of farmers/youths	10	7	13	20	14	5	19	73	52	125	94	70	164
Entrepreneurship development	4	0	14	9	0	22	22	0	53	53	0	89	89
Feed management	1	1	0	1	0	0	0	17	0	17	18	0	18
Fishery Production	17	39	15	30	16	7	20	159	43	202	214	65	279
Fodder production	1	4	2	6	1	4	5	4	0	4	9	6	15
Formation and management of SHGs	2	5	0	5	6	0	6	32	0	32	43	0	43
Goatery Management	4	14	4	11	8	0	0	51	12	63	73	16	89
Group dynamics	1	0	0	0	3	0	3	6	8	14	9	8	17
Income and employment generation	9	26	5	31	5	3	8	66	60	126	97	68	165
Income generation activities for empowerment of rural Women	17	7	51	41	6	56	40	42	97	139	55	204	259
Income Generation Activity	4		15			1			91		0	107	107
Integrated Crop Management	14	61	11	72	27	5	32	165	35	200	253	51	304
Integrated Farming	1	7	0	7	3	0	3	0	40	40	10	40	50
Integrated Farming Systems	1	5			5			5	0	5	15	0	15
Integrated Nutrient Management	1		9					0	31	31	0	40	40
Integrated Pest Management	2	3			3			22	2	24	28	2	30
Lac cultivation	2	2	0	2	6	0	6	21	0	21	29	0	29
Leadership development	1	0	0	0	0	0	0	20	9	29	20	9	29
Mushroom production technologies	30	71	27	88	242	169	360	268	216	484	581	412	993
Nursery management	3	0	0	0	0	10	10	21	0	15	21	10	31
Nursery raising	2	0	0	0	17	0	17	8	0	8	25	0	25
Organic manures production	16	42	9	45	45	21	56	164	8	172	251	38	289
Others	17	29	27	47	42	27	57	144	80	224	215	134	349
Plant propagation techniques	10	28	9	37	35	4	39	48	15	63	111	28	139
Planting material production	2	3	0	0	6	0	4	16	0	6	25	0	25
Post Harvest Technology	2	14	4	6	3	0	3	13	4	17	30	8	38
Poultry management	8	13	3	7	47	9	48	7	30	37	67	42	109
Processing and value addition	43	34	98	123	56	291	326	114	379	479	204	768	972
Production and Management technology	6	6	7	13	18	9	27	24	24	48	48	40	88
Production of high value crops	17	36	8	32	25	8	23	151	49	200	212	65	277
Production of low volume and high value crops	22	100	44	95	54	4	31	121	26	147	275	74	349
Production of organic inputs	1	11						16	0	16	27	0	27
Production technologies	2	3	6	9	4	9	13	3	5	8	10	20	30
Promotion of farm machinary and power	5	12	0	12	23	10	31	29	10	39	64	20	84
Propagation techniques of Ornamental Plants	9	26	3	11	9	7	16	70	34	104	105	44	149
Quail farming	1	9			6			0	0	0	15	0	15
Rural Crafts	2	0	12	12	13	4	4	2	7	9	15	23	38
Seed Production	14	35	13	38	44	28	67	79	34	113	158	75	233
Skill development for avenues of self emplyment	1	0	4	4	0	24	24	0	30	30	0	58	58
Soil fertility management	6	31	3	26	12	0	12	25	13	38	68	16	84
Value Addition	1	0	2	2	0	4	4	0	9	9	0	15	15
Vermi-compost production	23	50	40	82	127	57	184	196	47	243	373	144	517
Water management	8	107	5	112	58	1	59	205	24	229	370	30	400
Total	**370**	**888**	**474**	**1081**	**1077**	**809**	**1656**	**2703**	**1621**	**4198**	**4668**	**2904**	**7572**

5. Extension Programmes

With the objective of creating awareness about frontier technologies, a number of extension activities were organised by KVK at campus and at farmers' fields in the villages. These extension activities include method demonstration to small group to kisan mela for huge gathering. It also includes use of old communication techniques of poster exhibition to latest technique of SMS. Broadly, these activities are (i) advice based like Farm advisory services, lectures delivered as resource person and method demonstration (ii) Animal related like animal health and vaccination camp (iii) Literature based like exhibition, extension literature and popular article (iv) media based production of CD/DVD, Film show, News paper coverage, radio talks and TV talks (v) meeting based like ex-trainee sammelan, celebration of important days, club meet, farmers' seminar, field day, group meet, gosthi, mela SHG meeting and workshops (vi) soil related activities like soil health camp and soil test campaign (vii) visit based activities like diagnostic visits, exposure visits, farmers visit to KVK and scientists visits to farmers fields. Quanta of these activities are presented state wise graphically. In all 65062 activities were conducted and 7.27 lakh farmers, farm women, rural youth and extension workers were benefited (Table 5). The highest extension activities were conducted in Odisha (nearly 51%) followed by Madhya Pradesh (40%) and Chhattisgarh (10%) while the numbers of beneficiaries were in Madhya Pradesh (59%) followed by Odisha (28%) and Chhattisgarh (13%).

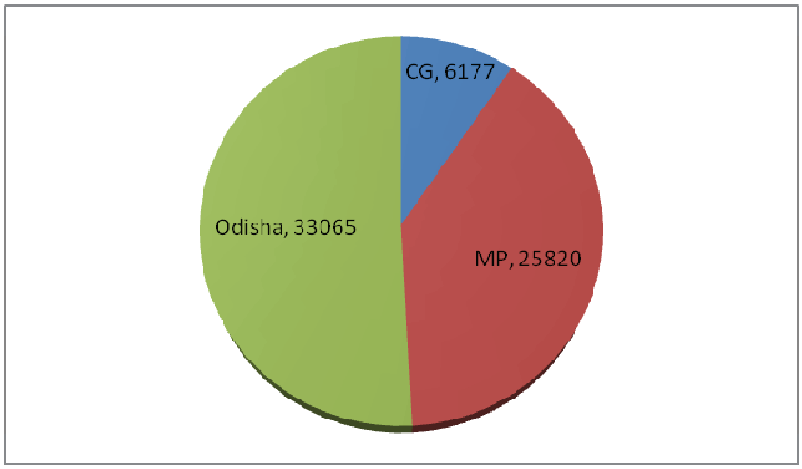


Fig. Number of extension activities conducted

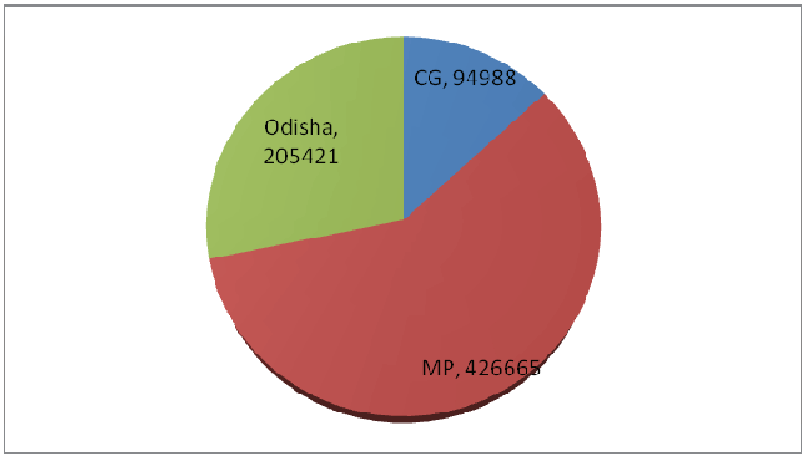


Fig. Number of beneficiaries through extension activities

Table 5 : Details of extension activities organized by the KVKs in Zone-VII during 2011-12

Activity	No. of activities	Detail of Participant												
		Farmers others male							Extension Personnel			Total of farmers and extension personnel		
		Others		SC/ST		Total								
		M	F	M	F	M	F	T	M	F	T	M	F	T
Agri mobile clinic	1301	1905	60	1163	171	3068	231	3299	203	60	263	3271	291	3562
Animal Health Camp	114	7947	316	1777	251	9724	567	10291	139	8	147	9863	575	10438
Celebration of important days	208	3854	1560	2128	1520	5982	3080	9062	171	67	238	6153	3147	9300
Diagnostic visits	2788	10621	1671	4414	1582	15035	3253	18288	369	89	458	15404	3342	18746
Electronic Media (CD./DVD)	21	89	35	22	32	111	67	178	11	2	13	122	69	191
Exhibition	265	47407	4660	19906	5495	67313	10155	77468	1729	303	2032	69042	10458	79500
Exposure visits	184	2867	397	1844	574	4711	971	5682	204	28	232	4915	999	5914
Extension Literature	644	14353	1067	6524	9848	20877	10915	31792	379	1881	2260	21256	12796	34052
Extrainees Sammelan	189	2936	481	1415	371	4351	852	5203	112	27	139	4463	879	5342
Farm advisory Services	2658	9664	969	2263	603	11927	1572	13499	278	25	303	12205	1597	13802
Farm Science Club conveners meet	223	3297	298	1196	318	4493	616	5109	97	14	111	4590	630	5220
Farmers Seminar	159	12243	307	1299	237	13542	544	14086	497	35	532	14039	579	14618
Farmers visit to KVK	32933	38281	4005	17296	9784	55577	13789	69366	1163	696	1859	56740	14485	71225
Field Day	753	14867	2818	8509	2765	23376	5583	28959	814	177	991	24190	5760	29950
Film Show	1911	22185	5127	16402	4046	38587	9173	47760	1216	225	1441	39803	9398	49201
Group meetings	1165	7593	1733	5796	1749	13389	3482	16871	260	55	315	13649	3537	17186
Kisan Ghosthi	578	16125	2531	10523	3408	26648	5939	32587	534	147	681	27182	6086	33268
Kisan Mela	140	64457	10216	34956	10513	99413	20729	120142	1395	164	1559	100808	20893	121701
Lectures delivered as resource person	2656	44269	7073	21067	6482	65336	13555	78891	2087	281	2368	67423	13836	81259
Mahila mandals conveners meetings	60	104	721	42	369	146	1090	1236	17	27	44	163	1117	1280
Method Demonstrations	488	5226	991	2508	1071	7734	2062	9796	358	90	448	8092	2152	10244
News paper coverage	2110	0	0	0	0	0	0	0	0	0	0	0	0	0
Popular articles	625	10218	2488	28044	3767	38262	6255	44517	85	32	117	38347	6287	44634
Radio talks	725	0	0	0	0	0	0	0	0	0	0	0	0	
Scientific visit to farmers field	10765	25399	3823	15175	3232	40574	7055	47629	450	78	528	41024	7133	48157
Self help group conveners meeting	254	1442	1826	766	827	2208	2653	4861	63	46	109	2271	2699	4970
Soil health Camp	165	2764	276	1181	262	3945	538	4483	55	11	66	4000	549	4549
Soil test campaigns	411	2891	413	2264	385	5155	798	5953	92	14	106	5247	812	6059
TV talks	501	0	0	0	0	0	0	0	0	0	0	0	0	0
Workshop	68	1325	318	709	100	2034	418	2452	224	30	254	2258	448	2706
Total	**65062**	374329	**56180**	**209189**	69762	**583518**	125942	**709460**	13002	4111	17614	**596520**	130554	**727074**

Note: M-Male, F-Female and T-Total

6. Technology week – to reach the Unreached

Technology week concept was given to the KVKs for showcasing the available technologies to the district level extension functionaries and farmers. During technology week, farmers could directly interact with KVK experts, technology generators and extension personnel which would result in higher adoption of the technology. Status of Technology week organized by KVKs in Zone VII is given in Table 6.

Table 6 : Details of technology week organized by the KVKs in Zone-VII during 2011-12

Name of KVK	Types of Activities	No. of Activities	Number of Participants	Related crop/livestock technology
48	Animal health camp	4	210	Cow buffalo goat etc
	Awareness camp	5	325	Bio-control & IPM strategy
	Bio Fertilizers (q)	518	2490	vermicompost,vermin,Agri,Horti,Pisciculture,Tricoderma, Bio pesticides
	Diagnostic Practical's	113	2275	Kharif & Rabi crops
	Distribution of Literature (No.)	13698	25687	Organic turmeric cultivation ,Soil health management ,ITK , value addition ,Mushroom cultivation & KVK News letter,News letter & Extension bulletins
	Distribution of Livestock specimen (No.)	2	5	Poultry chicks,Agri,Horti,Pisciculture,Mustard, Wheat, Tomato, Linseed, & vegetable crops.
	Distribution of Planting materials (No.)	42612	2101	Rabi vegetables/fruit plants, Seedling,A mangium, teak & papaya,Agri,Horti,Pisciculture,Papaya, Drum stick, Guava, Lemon
	Distribution of Seed (q)	522.5	5684	kharif crops & vegetables,Agri,Horti,Pisciculture,Improved variety of vegetables and Finger millet,Soybean, Gram
	Drudgery reduction	10	34	Improved sikle hand ridger maize sheller
	Ex trainees meet	1	50	Discuss about latest technology & feed back about adoption of technology.
	Exhibition	69	15151	Technlology popularized by KVK
	Exhibition of farm implement	2	42	Seed drill ,Turmeric boiling drum ,cono weeder ,M.B plough ,Rake weeder ,Groundnut decorticator ,Groundnut stripper ,Maize sheller
	Exposure visit	1	12	IISS & CIAE, Bhopal.
	Fair	103	5991	Poultry, Tomato, Cabbage, cauliflower
	Fair			Production technology of kharif crop,Kharif production technology,Oilseed Crops,
	Famers' Club convention	1	150	To motivate farmers for functional participation in Farmers club
	Farm Visit	774	8041	Technological demonstrations,Demonstration unit, crop museum, mushroom unit, Vermicompost unit.Display the improved technologies
	Farmers Scientist inter action programme	4	198	SRI method of Paddy cultivation.
	Field Day	2	90	Black gram & Soybean crop production technology.
	Film show	245	12998	ICM ofkharif crops,IPM, IDM, INM, IWM, mushroom cultivation, vermin-composting, varietal diversification

Name of KVK	Types of Activities	No. of Activities	Number of Participants	Related crop/livestock technology
	Fish feed management	1	29	Fish farming
	Gajar ghas & Vermicompostin g	2	50	Converting waste into resources
	Gajar Ghas Jagruta Saptah	27	510	Control measures of gajarghas etc.
	Gosthies	256	7510	Improve cultivation of paddy, Maize and Gram,Paddy.Vegetable , O&P,Paddy, groundnut, Niger, Runner bean, Cabbage, Onion, Brinjal & Tomato,Hybrid Maize
	IPM	1	24	Pp chenicals
	Lectures organized	795	9443	Integrated weed management in paddy, IPM in groundnut, INM in groundnut.INM in Maize,Rice ,Wheat
	Live Demonstration	5	564	Demonstrate working models to farmers for better working
	News coverage	3		*Parthenium* weed
	Plant health camp	1	46	Semonstrating farmers about healthy and integrated ways of plant health management
	Road show	1		Latest Scientific technology
	Seminar	1	25	Rabi crop wheat & chickpea.
	SHG Sammelan	1	100	To emphasize the importance and advantages of groups to farmers and farm women
	Soil health Awareness campaign	2	100	Making farmers aware about sustainable soil health and fertility management
	Soil health camp	2	64	Soil sampling and its importance
	Seed treatment campaign	2181	14875	Parthenium management,Visit of technology park, crop cafeteria, scion block, etc.
	Value addition	1	39	Tomato soup and pickle
	World Environment Day	2	72	To aware farming community regarding various environmental ssues
	Workshop	1	200	Water conservation &efficient use of irrigation water.
	Total number of farmers visited the Technology week		**115185**	

7. Production of Quality Seed and Planting Materials

Availability of the quality seeds timely and adequate happened to be the major constraints to the farmers. Therefore, it was taken as challenge and appropriate steps were taken at the KVKs for helping the farmers in this regard. With industrious efforts, a considerable progress has been made and there is increase in seed quantity as well as other planting materials as shown in the following Tables 7.1 and 7.2. The KVKs of the zone produced **19,901.55**q of seed and **38.76** lakhs numbers of planting material of different crops live cereals, pulses, oilseeds, vegetables, medicinal plants, fruits, etc. and distributed among farmers. Besides, KVKs of the zone also produced bio-products and livestock products at their farms.

Table 7.1 : Category-wise Seed produced by the KVKs in Zone VII

Category	Crop	Quantity (in quintal)
Cereals	Maize	166.55
Cereals	Paddy	6089.195
Cereals	Wheat	5543.06
Total Cereals		**11,798.81**
Minor Millets	**Ragi**	**18.70**
Oilseeds	Soybean	5839.05
Oilseeds	Safflower	184.80
Oilseeds	Groundnut	18.10
Oilseeds	Mustard	35.085
Oilseeds	Toria	5.55
Oilseeds	Linseed	4.00
Oilseeds	Sesamum	4.97
Oilseeds	Niger	1.35
Total Oilseeds		**6111.605**
Pulses	Chick pea	1470.35
Pulses	Green gram	225.35
Pulses	Field pea	148.50
Pulses	Blackgram	151.64
Pulses	Pigeon Pea	117.82
Pulses	Lentil	10.30
Total Pulses		**2123.96**
Fodder	Berseem	0.50
Fodder	Dhanicha	8.60
Total Fodder		**9.10**
Fruits	**Banana**	**2.62**
Green manure	**Sunhemp**	**0.50**
Medicinal	Aloe vera	9.00
Medicinal	Ashwagandha	0.04
Medicinal	Chandrasoor	5.00
Total Medicinal		**14.04**
Ornamental	**Marigold**	**0.95**
Spices	Coriander	0.60

Category	Crop	Quantity (in quintal)
Spices	Fenugreek	4.19
Spices	Garlic	11.60
Spices	Ginger	3.30
Spices	Turmeric	14.56
Total Spices		**34.25**
Vegetables	Onion	66.29
Vegetables	Potato	54.41
Vegetables	Okra	4.23
Vegetables	Cowpea	1.52
Vegetables	Tomato	0.55
Vegetables	Bottle guard	0.40
Vegetables	Brinjal	0.06
Vegetables	Carrot	0.05
Vegetables	Cauliflower	0.25
Vegetables	Chillies	0.79
Vegetables	Garden Pea	0.55
Vegetables	Lobia	0.26
Vegetables	Radish	0.05
Vegetables	Spinach	0.16
Vegetables	Sponge Gourd	0.07
Total Vegetables		**129.64**
Total seed produced		**19,901.55**

Table 7.2 : Category-wise Planting Materials produced by the KVKs in Zone VII

Group	crop	Quantity (in nos)
Fodder	Napier grass	20000
Forest species	Acasia mengium	3400
Forest species	Acasia mengium, acasia nilotica, Aonla, Arjunaand Khamhar, Eukaliptus	15000
Forest species	Amaltas	600
Forest species	Australian Teak	450
Forest species	Bamboo	9305
Forest species	Bamboo, Teak Eucalyptus, Acacia mangium	2165
Forest species	Casiasama	1200
Forest species	Eucalyptus	500
Forest species	Forest saplings	1708
Forest species	Gulmohar	700
Forest species	Kachnar	1500
Forest species	Karanj	800
Forest species	Mahua	100
Forest species	Mangium	524
Forest species	Napior grass	20000
Forest species	Neem	4550

Group	crop	Quantity (in nos)
Forest species	Salia Bamoo	334
Forest species	Seven	2000
Forest species	Shikakai	333
Forest species	Teak	2979
Forest species	Vidya	200
Total Forest species		**68348**
Fruits	Aonla	3174
Fruits	August	471
Fruits	Bael	12
Fruits	Bahera	449
Fruits	Banana	600
Fruits	Banana, Drumstick, Papaya	510
Fruits	Ber	411
Fruits	Custard apple	633
Fruits	Guava	15113
Fruits	Imli	1800
Fruits	Jackfruit	2173
Fruits	Jamun	524
Fruits	Karonda	47893
Fruits	Lemon	8187
Fruits	Lime	6000
Fruits	Lime+ Guava	32
Fruits	Litchi	100
Fruits	Maindrain	1780
Fruits	Mango	16250
Fruits	Mango, Guava, Cashew	3200
Fruits	Papaya	16148
Fruits	Pomegranate	205
Fruits	Sitaphal	2000
Fruits	Tissue culture bannana	300
Total Fruits		**127965**
Medicinal	Aloe vera	100
Medicinal	Aloe vera, Brahmi, Stivia, Aswagandha	286
Total Medicinal		**386**
Ornamental	Ashok	1641
Ornamental	Chameli	24
Ornamental	Chandani	19
Ornamental	Croton	9
Ornamental	Different	890
Ornamental	Durenta	15100
Ornamental	Faikus	3
Ornamental	Galladia	800
Ornamental	Gulmohar	11
Ornamental	Gurhal	42
Ornamental	Kachanar	60

Group	crop	Quantity (in nos)
Ornamental	Kapok	12
Ornamental	Karanj	20
Ornamental	Madhukamni,Chandni,Cliandra, Sudarshan etc.	500
Ornamental	Marigold	22604
Ornamental	Ratrani	55
Ornamental	Rose	641
Ornamental	Shisham	18
Ornamental	Shuo Plant	432
Total Ornamental		**42881**
Spices	Curry leaf	40
Spices	Ginger	1
Total Spices		**41**
Tuber	Sweet Potato	110000
Vegetable	Tomato, Brinjal, Papaya, Drumstick	179904
Vegetables	Brinjal	249222
Vegetables	Brinjal, chillies	2000
Vegetables	Brinjal, Tomato, Chilli, Drumstick, Cauliflower etc.	31806
Vegetables	Broccoli	4333
Vegetables	Cabbage	149418
Vegetables	Capsicum	9680
Vegetables	Cassava	100
Vegetables	Cauliflower	52599
Vegetables	Chilli, Brinjal, Tomato	7500
Vegetables	Chillies	332177
Vegetables	Chillies, cabbage	825
Vegetables	Cucurbits	300
Vegetables	Different	282000
Vegetables	Drumstick	8726
Vegetables	Drumstick, Karaunda, Casue nut	10000
Vegetables	Knol-khol	2400
Vegetables	Moringa	590
Vegetables	Onion	1480680
Vegetables	Papaya	2300
Vegetables	Pointed gourd	1000
Vegetables	Red cabbage	2708
Vegetables	Tomato	466593
Vegetables	Tomato, Brinjal, Chilli	100000
Vegetables	Tomato, Brinjal, Chilli, Onion	89000
Vegetables	Tomato, Brinjal, Papaya, Brocolli, Chilli, drumstick	5050
Vegetables	Vegetables	35960
Total Vegetables		**3506871**
Total Planting material		**3876492**

Production of Bio-Products

Status of bio-agents/bio pesticides/ bio fertilizers production by the KVKs of Zone VII are presented in Table 7.3.

Table 7.3 Production of bio-agents / bio pesticides/ bio fertilizers by KVKs in Zone VII

Major Group Bio agent/Bio fertilizers/Bio Pesticides	Name of the Product	Qty (In Kg)	Qty (In No)	Amount (Rs.)		Number of KVK
				Cost of inputs	Gross income	
Bio Agents	Earthworm (Eisinia foetida),Worms,Vermicompost,BGA	5290.6	6.15	567200	235150	10
Bio Agents	Tricoderma viridi,	915	3	7500	12400	4
Bio Fertilizers	Azotobactor	20	7000		19768	2
Bio Fertilizers	BGA (soil based)	100	20000		1000	1
Bio Fertilizers	PSB	50			71000	2
Bio Fertilizers	Raj Vijay Honey	23790		90000	2400	1
Bio Fertilizers	Rhizobium	20	8000 pkt		415000	2
Bio Fertilizers	Vermi compost	9106.5	2058.5	16800	119693	11
Bio Fertilizers	Azatobacter and Rhizobium	11950	516	106420	684050	7
Bio Pesticides	BGA,Panchgavya, Agneyastra, Neem extract	**71**	656	8800	11600	4
Grant Total		**51313.1**	**30239.65**	**796720**	**1572061**	**44**

Production of Livestock materials

Status of Livestock Production production by the KVKs of Zone VII are presented in Table 8.4.

Table 8.4: Status of Livestock Production in KVKs under Zone-VII during 2011-12

Name of the animal/bird/aquaties	Breed	Type of production	Quintity (No./Kg)	Value (in Rupees)	No. of KVKs
Aquatic species	Indian carp, IMC	fish,Yearlings	1020	4200	2
Buffalo	Murrah	Milk	4607.25	101359.5	1
Cattle	Cross Breed,Sahiwal	Milk	3806.55	332616.1	2
Cattle	Red sindhi X Jersy	Milk Cow	843	18,738	1
Duckery	Khakichambel, White ruller,	chicks	350	10500	1
Fish	IMC	Fingerlings,Fish Seed (yearlings),Spawn to fingerlings	62002.93	145500	4
Fisheries	Catla, rohu, Mrigal, Grasscarp	Table fish,Bulk	2.5	17000	2
Fisheries	Ornamental (Live bearer)	Adult,Gold fish,black molly,Colour fish	322	1320	3
Fisheries	Ornamental Fish,Rohu, Katala etc	Fingerlings	500	13166	2
Fisheries	Rohu, Katla & Mrigal,	Fingerlings	370	30600	2
Honey bee				2500	1
Others (Specify)	Duck – Naghans, Khaki Camble	Duck & Egg	280	3700	1

Name of the animal/bird/aquaties	Breed	Type of production	Quintity (No./Kg)	Value (in Rupees)	No. of KVKs
Piggary	Krishnashyar	Pig	8	4200	1
Poultry	Banaraja	21 day chick	12679	187642	12
Poultry	Grampriya, Vanraja & Local	Layer &Egg	320	3500	1
Poultry	Kadaknath	Chicken (bird)	200	8000	1
Poultry	Vanaraja	chicks	2858	114348	2
Sheep and Goat	Barbari	Buck	3	6400	1
Sheep and Goat	Jamunapari,	Kids	10	33150	1
Turkey	Colour bird Var. Blackrock, RIR, Banaraja, Kalinga brown	Chicks	800	28200	1
Grant Total			**90982.23**	**1066640**	**42**

Details of soil, water and plant analysis

Soil and water testing is an import activity of KVK for improving the soil fertility and sustainability of agricultural production. During the year the KVKs of zone analyzed 79544 soil samples and 565 water samples though which more than 72 thousand farmers of 2302 villages were benefitted (Table 8.5). The highest numbers of samples were tested in the state of Madhya Pradesh followed by Odisha and Chhattisgarh. The KVK wise details of soil and water samples tested are given in Table 8.5.

Table 8.5: Summary of soil and water samples tested by the KVKs in Zone-VII during 2011-12

State	Details	No. of Samples	No. of Farmers	No. of Villages covered
Madhya Pradesh	Soil samples	71738	66101	1557
	Water samples	121	112	32
Chhattisgarh	Soil samples	719	709	39
Odisha	Soil samples	7087	5509	587
	Water samples	444	247	87
Zone-VII	**Soil samples**	79544	72319	2183
	Water samples	565	359	119
	Total	80109	72678	2302

8. SCIENTIFIC ADVISORY COMMITTEE

The Scientific Advisory Committee meetings were conducted to get necessary guidance and support to carry out the mandated activities of KVK in a more planned and scientific manner by participating the members from research institution, ZPD, line department, farmers, etc. The Committee monitors progress and facilitate in-depth exchange of views in specific fields. The Committee evolves the scientific and technical vision documents for the KVK, reviews periodically and takes further course of action as deemed fit for furthering scientific and technological activities of the KVK. Therefore, all KVKs were asked to conduct the meetings on the periodical basis (twice in a year). Total 111 SAC meetings conducted are presented in Table 8.5. Out of 100 functional KVKs, 88 KVKs have conducted their SAC.

Table 8: Status of SAC conducted by KVKs of Zone VII during 2011-12

State	Host	S. No.	Name of KVKs	No. of SACs Conducted
Chhattisgarh	IGKV	1	Baster	1
Chhattisgarh	IGKV	2	Bilaspur	1
Chhattisgarh	IGKV	3	Dantewada	1
Chhattisgarh	IGKV	4	Dhamtari	1
Chhattisgarh	IGKV	5	Durg	1
Chhattisgarh	IGKV	6	Janjgir Champa	1
Chhattisgarh	IGKV	7	Jashpur	1
Chhattisgarh	IGKV	8	Kanker	1
Chhattisgarh	IGKV	9	Kawardha	1
Chhattisgarh	IGKV	10	Korba	1
Chhattisgarh	IGKV	11	Korea	1
Chhattisgarh	IGKV	12	Mahasamund	1
Chhattisgarh	IGKV	13	Raigarh	1
Chhattisgarh	IGKV	14	Raipur	1
Chhattisgarh	IGKV	15	Rajnandgon	1
Chhattisgarh	IGKV	16	Sarguja	1
Total				**16**
Madhya Pradesh	JNKVV	1	Balaghat	2
Madhya Pradesh	JNKVV	2	Betul	1
Madhya Pradesh	JNKVV	3	Chhatarpur	1
Madhya Pradesh	JNKVV	4	Chhindwara	1
Madhya Pradesh	JNKVV	5	Damoh	1
Madhya Pradesh	JNKVV	6	Dindori	1
Madhya Pradesh	JNKVV	7	Harda	1
Madhya Pradesh	JNKVV	8	Hoshangabad	1
Madhya Pradesh	JNKVV	9	Jabalpur	0

State	Host	S. No.	Name of KVKs	No. of SACs Conducted
Madhya Pradesh	JNKVV	10	Katni	1
Madhya Pradesh	JNKVV	11	Mandla	1
Madhya Pradesh	JNKVV	12	Narsinghpur	1
Madhya Pradesh	JNKVV	13	Panna	1
Madhya Pradesh	JNKVV	14	Rewa	1
Madhya Pradesh	JNKVV	15	Sagar	0
Madhya Pradesh	JNKVV	16	Seoni	1
Madhya Pradesh	JNKVV	17	Shahdol	1
Madhya Pradesh	JNKVV	18	Sidhi	1
Madhya Pradesh	JNKVV	19	Tikamgarh	0
Madhya Pradesh	JNKVV	20	Umaria	1
Madhya Pradesh	RVSKVV	21	Ashoknagar	2
Madhya Pradesh	RVSKVV	22	Badwani	2
Madhya Pradesh	RVSKVV	23	Bhind	2
Madhya Pradesh	RVSKVV	24	Datia	2
Madhya Pradesh	RVSKVV	25	Dewas	2
Madhya Pradesh	RVSKVV	26	Dhar	2
Madhya Pradesh	RVSKVV	27	Guna	2
Madhya Pradesh	RVSKVV	28	Gwalior	2
Madhya Pradesh	RVSKVV	29	Jhabua	2
Madhya Pradesh	RVSKVV	30	Khandwa	2
Madhya Pradesh	RVSKVV	31	Khargone	2
Madhya Pradesh	RVSKVV	32	Mandsaur	2
Madhya Pradesh	RVSKVV	33	Morena	2
Madhya Pradesh	RVSKVV	34	Neemuch	2
Madhya Pradesh	RVSKVV	35	Rajgarh	2
Madhya Pradesh	RVSKVV	36	Shajapur	2
Madhya Pradesh	RVSKVV	37	Sheopur	2
Madhya Pradesh	RVSKVV	38	Shivpuri	2
Madhya Pradesh	RVSKVV	39	Ujjain	2
Madhya Pradesh	NGO	40	Burhanpur	1
Madhya Pradesh	NGO	41	Indore	1
Madhya Pradesh	NGO	42	Ratlam	2
Madhya Pradesh	NGO	43	Raisen	2
Madhya Pradesh	NGO	44	Satna	1
Madhya Pradesh	NGO	45	Sehore	2
Madhya Pradesh	ICAR	46	Bhopal	0
Total				**65**

State	Host	S. No.	Name of KVKs	No. of SACs Conducted
Odisha	OUAT	1	Angul	1
Odisha	OUAT	2	Balasore	1
Odisha	OUAT	3	Bargarh	1
Odisha	OUAT	4	Bhadrak	1
Odisha	OUAT	5	Bolangir	1
Odisha	OUAT	6	Boudh	1
Odisha	CRRI	7	Cuttack	1
Odisha	OUAT	8	Deogarh	1
Odisha	OUAT	9	Dhenkanal	1
Odisha	OUAT	10	Gajapati	1
Odisha	OUAT	11	Ganjam	1
Odisha	OUAT	12	Jagatsinghpur	1
Odisha	OUAT	13	Jajpur	1
Odisha	OUAT	14	Jharsuguda	1
Odisha	OUAT	15	Kalahandi	1
Odisha	OUAT	16	Kandhamal	1
Odisha	OUAT	17	Kendrapara	1
Odisha	OUAT	18	Keonjhar	1
Odisha	CIFA	19	Khurda	1
Odisha	OUAT	20	Koraput	1
Odisha	OUAT	21	Malkangiri	1
Odisha	OUAT	22	Mayurbhanj	1
Odisha	OUAT	23	Nabarangpur	1
Odisha	OUAT	24	Nayagarh	1
Odisha	OUAT	25	Nuapada	1
Odisha	OUAT	26	Puri	1
Odisha	OUAT	27	Rayagada	1
Odisha	OUAT	28	Sambalpur	1
Odisha	OUAT	29	Sonepur	1
Odisha	OUAT	30	Sundargarh	1
Total				**30**
Total – Zone VII				**111**

9. Technological backstopping through literature and media

9.1 Newsletter

Status of Newsletter published by the KVKs of Zone VII during 2011-12 are presented in Table 9.1

Table 9.1: State wise Newsletter published by the KVKs of Zone VII during 2011-12

State	No. of issues	No. of copies printed	No. of copies distributed
Madhya Pradesh	134	128610	128159
Chhattisgarh	60	38700	35680
Odisha	75	45600	43634
Zone VII	**269**	**212910**	**207473**

9.2. Publications

Status of literature and print media published by the KVKs of Zone VII during 2011-12 are presented in Table 9.2

Table 9.1: Category wise literature and print media published by the KVKs of Zone VII during 2011-12

Category	No. of KVKs	Number
Research Paper	26	122
Technical bulletins	17	62
Technical reports	13	27
Other reports		
Abstracts	2	9
Popular Articles	29	184
Blog	1	4
Pumphlet (No. of Copies)	3	18
Leaflets/Folder (No. of Copies)	43	315
Book/Booklet (No. of Copies)	18	62
Conceptual Paper	1	1
Calender	1	1
Extension Literature	5	38
Folder (No. of copies)	15	91
News paper Coverage	4	4
Newsletter	12	17
Poster	5	19
Sovenir	1	1
Technical Booklet	1	1
Technical Folder	1	2
Training Material	1	3
Year Planner	6	6
CDs (No. of Copies)	25	57
DVDs (No. of Copies)	4	8
Total	234	1052

10. Details on HRD activities

Table 10. HRD activities organized in identified area for KVK staff by the Directorate of Extension

Title of Training	Date	No. of Programme	No. of Participant	No. of KVKs involved
Indira Gandhi Agricultural University, Raipur (Chhattisgarh)				
Use of implements for mechanization in Agriculture.	25/07/2011 & 26/07/2011	1	18	16
Methodologies for analysis of primary & secondary data	12-08-2011	1	20	16
Production technology of important Rabi crops	15/09/2011 & 16/09/2011	1	16	16
Capacity building training programme of PRA techniques	04/01/2011 & 7/01/2012	1	10	16
Total		**4**	**64**	**64**
Orissa Agricultural University & Technology, Bhubaneswar (Odisha)				
Women friendly tools and equipment	09/06/2011 & 10/06/2011	1	31	31
Mushroom Spawn Production	14/11/2011 & 16/11/2011	1	24	24
Farming system approach	16/01/2012 & 17/01/2012	1	31	31
Integrted nutrient management	30-01-2012	1	30	30
Integrted weed management	31-01-2012	1	30	30
Integrted pest management	09-02-2012	1	27	27
Care and management of birds and small animals	29-02-2012	1	25	25
Seed production and management of fin and shell fish	06-03-2012	1	15	15
Advance in nursery and plant propagation	17-03-2012	1	27	27
Total		**9**	**240**	**240**
Rajmata Vijiya Sindhiya Krishi Vishwa Vidyalaya, Gwalior (Madhya Pradesh)				
Integrated weed management for sustanible agriculture	21-6-2011 & 22-6-2011	1	42	19
Crop intensification for enhancing resource use effeciency	17-8-2011 & 18-8-2011	1	39	24
Process documentation	19-08-2011	1	27	22
Post harvest technology	8-12-2011 & 9-12-2011	1	43	20
Conservation agriculture	7-2-2012 & 8-2-2012	1	34	22
Total		**5**	**185**	**107**
Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (Madhya Pradesh)				
Review Meeting of KVKs for QRT	21/04/2011 & 22/04/2011	1	20	20

Title of Training	Date	No. of Programme	No. of Participant	No. of KVKs involved
Pre Zonal Workshop of KVKs	23/04/2011	1	20	20
Technology back stopping on preparation of Soil Health Card	19/05/2011	1	9	9
Review of KVKs activities	17/06/2011	1	20	20
Review of KVKs activities	06/09/2011 & 07/09/2011	1	22	22
Review meeting to discuss administrative, financial and technical issues of KVKs	29/09/2011	1	20	20
Technology back stopping to arrangements of exhibits in 6th National Conference on KVK- 2011	11-03-2011	1	20	20
Knowledge Empowerment & Technical Backstopping of KVK Scientists	13/03/2012	1	17	6
Knowledge Empowerment & Technical Backstopping of KVK Scientists	14/03/2012	1	24	7
Knowledge Empowerment & Technical Backstopping of KVK Scientists	15/03/2012	1	18	7
Total		**11**	**202**	**163**

Training/workshop/QRT organized

The four KVK-QRT mettings were conducted at ZPD, Jabalpur, RVSKVV Gwalior, IGKV Raipur and OUAT Bhubaneswar for reviewing the performace of KVK of Madhya Pradesh, Chhatishgarh and Odisha under Zone-VII during the period 2004-2005 to 2009-2010 under the Charimanship of Dr. R.B.Deshmukh.

11. Success Story

1. A wonderful Commercial Farming System Model of Mr. Kamlesh Gupta – KVK, Surguja, Chhattisgarh

Under farming systems studies the success story of farmer Kamlesh Gupta is worth mentioning. After his graduation Mr. Gupta started farming with his paternal landholding of about 3.0 ha. He purchased two Jursi cows in Rs 36000 who initially gave 5-6 litres milk per meeting but gradually the milk production came down and both of the cows dried up after 4 months. Not only this the cows had not been conceiving since last ten months .His first experience with cultivation of crops viz. rice IR-36 and local Jeera phool in (1.5ha) kharif and rabi wheat in small area of 0.5ha, was also not encouraging. Till now he was disappointed and thinking to switch over to other business. Meanwhile in January 2005, Dr .R .K. Mishra, Agronomist along with KVK team visited to him during the course of survey and selection of farmers for farming system programme and when he was asked about F.S. components and other activities ,he reluctantly said I am failure to manage my cows and crops and getting in loss. He said my investment in cows were useless neither I got milk production nor they were conceiving after drying up 10 months before, Dr. Mishra, said him that they would come next day. Next day Dr. Mishra took veterinary surgeon Dr. Singh to his farm there Dr. Singh enquired about feeding, nutrition etc. and instructed him to fallow the schedule as prescribed to him for feeding green fodder, concentrate, minerals and vitamins and asked him to report after one month. He followed the prescribed instruction and found that within one month both of his cows came to heat and subsequently conceived after A.I, and gave birth to healthy calves. There was drastic change in health and body weight also.

Output: Now he could understand the importance of proper feeding, nutrition minerals, and vitamins supplements .At present he has 40 cows and 21 buffalos, all of improved breeds. He also started poultry (rotation of 1000 birds) and fish production in a big pond. Today he is running the largest dairy and supply about 500lits of milk daily. He has scientific schedule for green fodder production i.e. Chari Berseem Sudan grass, oat, Napier bajra maize, cowpea etc. The animals are given full care. He has taken up commercial Vermin compost production .He is producing vegetables organically. He is earning an average income of Rs.24.00-25.00 lakh per annum from his farming systems components under technical guidance of Krishi Vigyan Kendra, Ambkapur.

He has taken up round the year green fodder production programme and low cost nutritive and balanced feed self prepared combination of essential minerals, vitamins, concentrate etc. for the animal components. He is running scientifically and well managed farming system enterprises and earning a hand some profit. He is an ideal & modern farmer for this region.

Outcome: Mr. Kamlesh Gupta has shown an ideal farming system unit with agronomic crop production, where each enterprise is complimenting the farm income and is helpful in

recycling of farm residues/wastes. Thus the selections of enterprises are on the cardinal principles of minimizing the competition and maximizing the complementary behaviors between the enterprises. The system is economically viable and environment friendly. It is providing support to rural economy and as such creating extra employment opportunity (6118 man days) at village and restricting the migration of farm workers as well.



2. Profit through Grading and Packaging of Mandarin - KVK Neemuch, Madhya Pradesh

Introduction:

Neemuch district produces a large number of crops which includes oilseeds, cereals, pulses, spices, medicinal, vegetables and fruit crops. Mandarin is one of the major fruit crops of the district having an area of 3000 ha. Farmers get good production but they are unable to get good price due to various sizes of fruits. There is wide scope of grading and packaging to get higher return.

Therefore it was decided to study the success story of the above farmer of village Jaisinghpura. Pradeep Patidar has 5.0 ha. Land out of which he grows mandarin in 1.0 ha. Area. Earlier the farmer used to sell the ungraded produce in local market and get the lower price. During the year 2010 he came into contact with KVK Neemuch. KVK scientists advised him to follow the recommended package of practices to get higher yield. They also suggested for gradation and packaging before selling in the market to get more price.The farmer was agreed and he purchased a locally made mandarin grader.

Shri Pradeep Kumar Patidar got net returns rupees 3,61,200/- by following recommended package of practises in mandarin under the technical guidance of KVK Neemuch scientists as compared to earlier net income from mandarin i.e. 2,60,100/- it helped him to improve his socio economic status.

Conclusion-

Better income may be obtained by the farmers from the cultivation of mandarin with recommended package of practises along with sale of produce in the market after grading and packaging.

3. Pond Based Integrated Farming system – KVK Keonjhar, Odisha

Mr. Jayanta Kumar Mohanta a young farmer with 1.2 ha of land holding mostly situated in the medium land condition. Unlike other rural youths of village Barigaon Jayanta Kumar Mohanta has strong affinity towards agriculture and still believed that with adoption of improved technologies he can bring a big change in the productivity and income level. In consultation with the multi-disciplinary KVK Scientist, he raised 1.2 ha of integrated farming system including paddy(0.6 ha), Pisciculture including fry fingerlings rearing(0.32 ha), seasonal vegetables(0.32ha), banana(50plants) with diary and goatry. He also keeps small birds like ducks for extra income.During kharif season, he grows 1.5 acres of rice and grows seasonal vegetables like cowpea, bitter gourd, beans, brinjal and cole crops during rabi.. KVK, Keonjhar has not only supported Mr. Mohanta through FLD and training but also tried to link with other organization and line departments for the integrated development of his farm. Within three years he has been able to reap the benefits of his hard work and realized a perceptible change in his income and social status.

Sl. No.	Enterprises	Gross cropped Area/ No.	Cost of cultivation (Rs.)	Gross return (Rs.)	Net Monetary Return (Rs.)	B.C. Ratio	Employment generation (Mandays)		
							Male	Female	Total
1. Crop components (Paddy)									
i	Paddy	0.6 ha	15,100	27,180	12,080	1.8	38	82	120
	Total	**0.6 ha**	**15,100**	**27,180**	**12,080**	**1.8**	**38**	**82**	**120**
2. Horticultural crops									
i	Banana	50 plants	2,500	5,200	2,700	2.08	10	8	18
ii	Seasonal vegetables (Brinjal, Cole crops, tomato etc)	0.32 ha	21,200	61,820	39,620	2.91	128	55	183
	Total	**0.36 ha**	**23,700**	**67,020**	**42,320**	**2.82**	**138**	**63**	**201**
3. Live stock									
i	Diary (Cross breed)	2 nos	32000	49000	17000	1.7	61	12	73
ii	Goatry	12 nos	10500	36400	25900	3.46	42	10	52
	Total	**14**	**42500**	**85,400**	**42900**	**2.00**	**103**	**22**	**125**
4. Poultry									
i	Duckery	50	4,000	10,800	6,800	2.7	3	7	10
5. Pisciculture									
i.	Carp polyculture (Carps & Prawn)	0.24 ha	22,100	53900	31800	2.43	36	17	53
ii.	Nursery pond (Fry to fingerlings)	0.08 ha	5,800	18,100	12,300	3.61	10	7	17
		0.32 ha	**27,900**	**72,000**	**44,400**	**2.58**	**46**	**24**	**70**
6. Other Enterprises									
Grand total		**1.28**	**113200**	**2, 62,400**	**1,48,500**	**2.31**	**328**	**198**	**526**
Conventional method									
i	Paddy	0.6 ha	14,000	20,200	6,800	1.44	38	82	120
ii	Carp polyculture (Carps only)	0.24 ha	11,000	19500	8500	1.77	30	12	42
Total		**0.84 ha**	**25,000**	**39,700**	**15,300**	**1.58**	**68**	**94**	**162**
Benefit over conventional method Rs. 1,33,200 per year									

4. Watermelon is profitable crop – KVK Boudh, Odisha

Introduction

Mr. Manoj kumar Pradhan was cultivating paddy in kharif and greengram in small scale in summer season. But he was getting lower profit of rupee 60,000 from the above crops grown under 16 acre land. He was in search of growing some profitable crop in his land.

The soil type of majority of his land is sandy loam to loam. Besides there is facilities of canal irrigation in his land and better scope of marketing of water melon.

Intervention

Keeping in view such scope of water melon cultivation KVK, Boudh implemented a front line demonstration on transplanting techniques of water melon and conducted training of integrated crop management in water melon.

Details of technology implemented:

1. Use of HYV of water melon- Sugar baby
2. Sowing seed in poly bag and transplanting it at 10-15 days of sowing for reducing mortality
3. Application of recommended dose of fertilizer
4. Foliar application of boron @ 2g per litre
5. Application of Ethrel @ 0.5 ml per litre at 2 and 4 true leaf stages
6. Integrated disease and pest management measure

Output

Year	Area, ha	Cost of cultivation, Rs	Production, qt	Productivity, qt/ha	Gross return, Rs	Net return, Rs	B/C ratio
2008	2	38,000	320	160	1,34,000	96,000	3.4
2009	2	72,400	446	223	2,31,920	1,59,520	3.2

Outcome

Seeing the performance of watermelon cultivation neighboring farmers were impressed and showed in interest to cultivate water melon in their own field by adopting this technique. This technology has been spread horizontally to 30 ha of area in that village and 14 ha of area in the adjacent village.

Impact

Social impact: His socio-economic standard has been improved and changed his kaccha house to pacca house; provide better education to his son and daughter.

Economic impact: His area under water melon has been increased to 3 ha and he creates 300 man days approximately for cultivation of water melon. He has planned to buy a motor cycle in coming year.

Techonolocal impact: Most of the farmer of his village and neighboring village frequently visit his field and take technology advice from him.

Conclusions

Water melon is a profitable crop. By cultivating this crop Sri Manoj Kumar Pradhan has set an example as a progressive farmer for other farmers in the neighboring area.

A successful farmer of watermelon cultivation

12. Flagship Programmes in Zone VII

1. Kisan Mobile Advisory (KMA)

Kisan Mobile Advisory (KMA) is the easiest ICT tool working successfully for dissemination of latest information to the farmers and farm women in the states of Madhya Pradesh, Chhattisgarh and Orissa. This ICT based *alternate agricultural information and rural delivery mechanism through Mobilephone* was initiated during 2007 in ZPD Zone VII, Jabalpur. It is based on the linear model of communication. This is the unique programme for making linkages between different stakeholders who is key player for making Indian agriculture sustainable in the coming future through intensive use of ICT tools like mobile phone. Short Message Service (SMS) is being provided by KVKs. KVKs implemented the programme and during 2011-12, total 7086 text messages were sent which benefitted to 86138 users including by the operational KVKs in the Zone. KVKs is Zone VII have registered approaching one lakh e-farmers for sending the technical information to them timely using KMA.

Table: Details of KMA during 2011-12 in KVKs of Zone VII

State	No. of KVK	No. of messages	No. of Farmers	No. of Women	No. of Extn. Personnel	Total Beneficiary
M.P.	47	3748	41947	3648	3544	49139
CG	20	894	8284	720	1022	10026
Odisha	33	2444	22686	1972	2315	26973
Zone VII	100	7086	72917	6340	6881	86138

2. Climate Resilience Agriculture through KVK under NICRA

Climate change happened to be a threat to our food security and livelihoods of the millions of people in India. Models predict that rising temperatures, increased climate variability and extreme weather events could significant impact food production in the coming decades impacting the growth of agricultural GDP. Keeping in view the importance of the climate change, ICAR has launched – **National Initiatives on Climate Resilient Agriculture in which** 14 KVKs of Zone VII have been selected under Technology demonstration component so that farmers could be well aware with the climate change and its consequences as well as suitable mitigation and adaptation strategy by understanding and practicing at their situation.

NICRA is operational in 14 selected districts (7 in Madhya Pradesh and 3 in Chhattisgarh and 4 in Odisha) for conducting technology demonstrations. During the reporting period the selected KVKs covered 1177 farmers under NRM interventions viz. in-situ moisture conservation practices, water harvesting and recycling, ground water recharge, improved drainage in flood prone area, micro irrigation systems etc. A total of 3085 demonstrations were conducted on crop production in 1428.25 ha on drought tolerant and short duration

varieties, location specific inter cropping systems, crop diversification, disease and pest management, nutrient management etc. KVKs conducted demonstrations on 143.1 ha area for fodder & other use at 1015 farmers' locations and benefitted 2896 units of livestock and fisheries. KVKs covered 1656 farmers under institutional interventions viz. use of community lands for seed production, fodder bank, custom hiring of farm implements, etc. KVKs organized 310 training programmes for 8874 farmers on soil health management, contingency cropping, vegetable production, far

m mechanization, pest and disease management, live stock management, etc.

3. Technological Demonstration for Harnessing Pulse Productivity

Pulse has been an important crop both for nutrition as well as import and foreign reserve aspect in India. A number of technological break-through were done with intention to raise the productivity levels demonstrated at farmers' fields with their active participation so as to convince them and build their confidence in new technologies. But, there has not been desirable increase in area and productivity of pulses over the years. Old varieties and practices are still in operation in many parts. This programme addressed application of selected technologies related to five major pulses crops viz. chickpea, pigeon pea, greengram, blackgram and lentil. The programme envisages demonstrating production potential of newly developed technologies and varieties of pulses at farmers' fields through KVKs to enhance production of pulses in the country. Results obtained are as follows:

In Madhya Pradesh:

1. Blackgram : The average yield in demonstration plot was 9.48 q/ha and farmers practice 6.60 q/ha, whereas yield increase was observed 43.45 percent. The common varieties used by the KVKs were - PU -35, TU 98-14, JU-3, PU-31, JU-86, Azad-1, and RBU-38.

2. Gram : The average yield in demonstration plot was 13.35 q/ha and farmers practice 10.10 q/ha, whereas yield increase was observed 32.1 percent. The common varieties used by the KVKs were JG 130, JG-16, JG-63, JG-11, and JG-322**.**

3. Lentil : The average yield in demonstration plot was 9.04 q/ha and farmers practice 6.2 q/ha ,whereas yield increase was observed 45.00 percent. The common varieties used by KVKs were JL-3, LBG-20, DPL-63.

4.Pigeonpea: The average yield in demonstration plot was 13.49 q/ha and farmers practice 10.55 q/ha ,whereas yield increase was observed 27.06 percent. The common varieties used by KVKs were JKM189, TJT 501, ICPL 88039, ICPH 2671, and Asha.

In Odisha

1. **Blackgram** : The average yield in demonstration plot was 7.18 q/ha and farmers practice 5.58 q/ha, whereas yield increase was observed 28.67 percent. The common varieties used by the KVKs were - PU31, PU-31, 1. PU-35, Shekhar-2.

2. **Greengram**: The average yield in demonstration plot was 8.25 q/ha and farmers practice 5.82 q/ha, whereas yield increase was observed 41.75 percent. The common varieties used by the KVKs were - PDM-139, PDM-139, and TARM-1.

3. **Pigeonpea:** The average yield in demonstration plot was **8.95** q/ha and farmers practice 6.90 q/ha, whereas yield increase was observed 29.71 percent. The common varieties used by KVKs were UPAS-120, Asha.

4. Tribal Sub Plan (TSP)

This scheme is aimed for 'Enhancing Pulses Production for Food Nutritional Security and livelihoods of Tribal Community through Demonstration and Training' and is operational in 10 KVKs located in the tribal region of the M.P. and Chhattisgarh under Zone VII. This scheme has started in rabi 2011-12 for demonstrating all the technological packages as per prevailing situations and needs of tribal community in a particular district by KVKs. Results shown that for creating awareness about the technologies KVKs organized 13 Kisan Gosthies benefiting 358 farmers, 24 field days with 1865 beneficiary, 6 diagnostic field visits covering 68 farmers plots and many newspaper coverage.

Field day

Line sowing operation with NARI by bullock

Details of storage bin, Knapsack sprayers distributed under TSP-Pulses-Rabi 2011-12 by KVK

Sr.No	Name of KVK	No. of storage bin	No. of Knapsack sprayers
1.	Knaker	60	9
2.	Bastar	60	9
3.	Dindori	60	9
4.	Dhar	60	9
5.	Badwani	60	9
6.	Jhabua	60	9
7.	Mandla	60	9
8.	Shahdol	45	9
9.	Dantewada	60	9
10.	Kabirdham	60	9
Total	**10 KVK**	**585**	**90**

5. ISOPOM on Maize-

Demonstration and training on maize were conducted under ISOPOM Scheme during the reporting period.The new HYV and hybrids of maize were undertaken for the purpose.These are HQPM-1,Proagro4640,Scorpio,Hycel etc..Eight KVKs were conducted the demonstration in area of 561 acre and average production of 42.94 and 55.13 q/ha. in Kharif and Rabi were recorded ;respectively under Zone-VII.

13. Establishment of Agro-technology Park and Components of KVK-ATP in ZPD Zone VII

Establishing Agro-technology Park at KVK

The main aim of establishing this park is showcasing the all appropriate technology at the KVK to the farmer visitors and KVK staffs for technological empowerment of farmer and farm women of the district. The concept has started with following major objectives

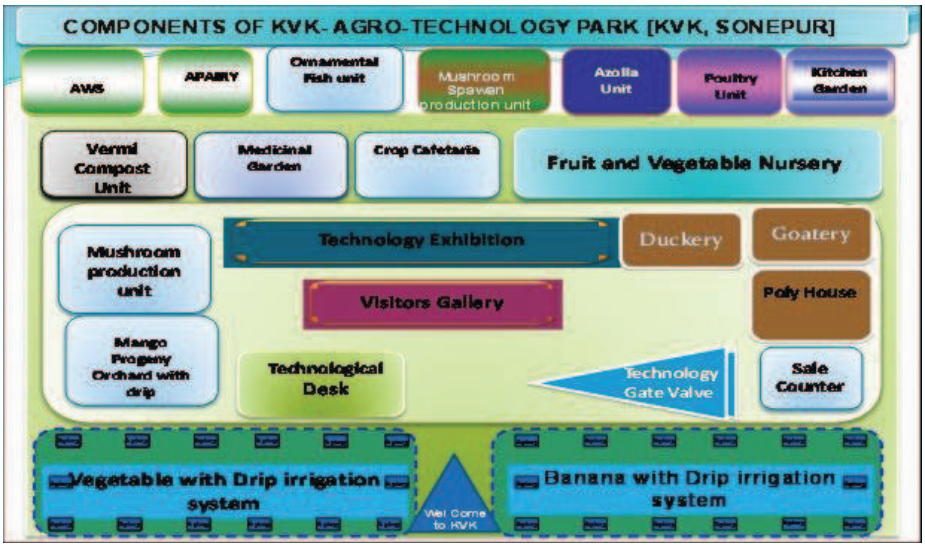
1. To exhibit the available technology at the KVK suitable for the district.
2. Provide functional exposure to dynamic replicable models to meet location specific needs of the farming community,
3. Promote participative vis-à-vis partnership network between demonstration Teams, development officials and users,
4. To pursue the farmers for better understanding, practice/display of operational skills and produce high quality products,
5. To convince the visitors about the role of improved agro-technology in income generation,
6. To sensitize the extension functionary of GO/NGO about the technology basket of the ICAR.

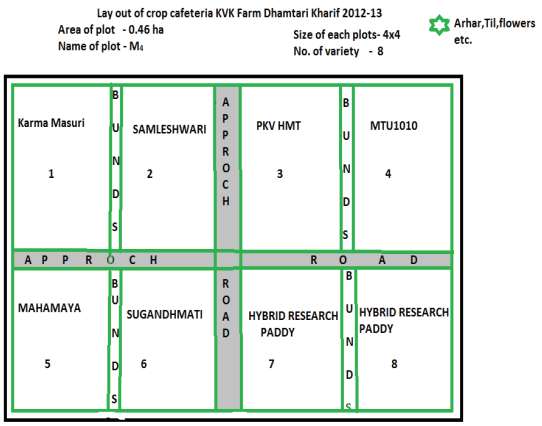
Components of KVK-ATP

There may be many components of KVK-ATP, but at present following five component has been identified, out of which Crop cafeteria has been implemented in most of the KVKs -

1. Crop Cafeteria
2. Technology Desk
3. Visitors Gallery
4. Technology Exhibition
5. Technology Gate-valve

Keeping in view the importance of the concept, we have divided the works into many steps, first we want to establish the Crop Cafeteria, for which each KVK has been asked to prepare layout according to their land situation and location of the KVK infrastructures.





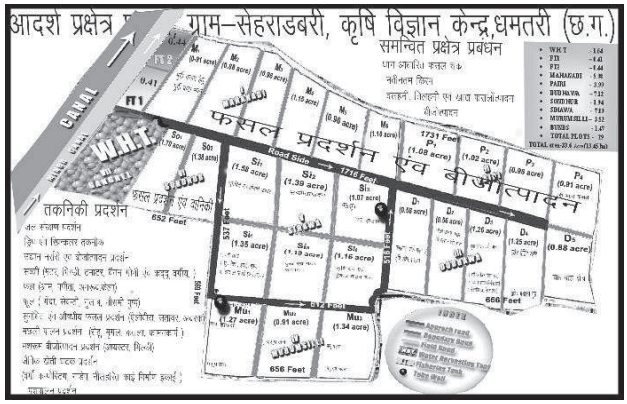
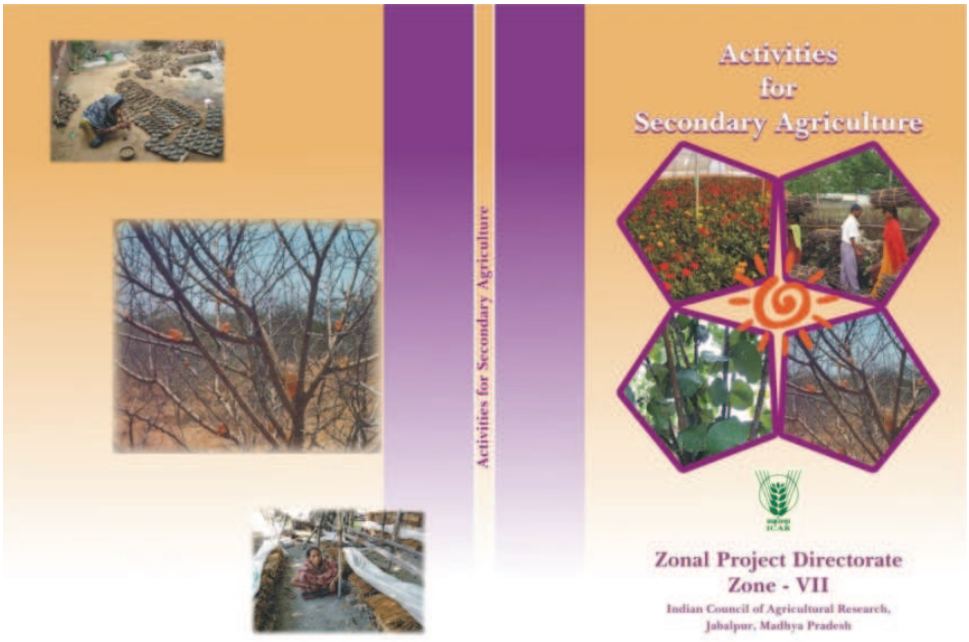


Fig. of Layout of crop cafeteria and photographs

14. New Initiatives

KVK is performing very well in the farmers' condition through its well planned mandated activities under the guidance of Division of Agricultural Extension and monitoring system of the ZPD with Director Extension. But due to lack of proper documentation of its works and impact, only few KVK got recognition and appreciation from the farmers and other authorities. Keeping in view the importance of the matter, ZPD Zone VII initiated the work and documented the various activities done by the KVK during previous 5-10 years. The impact was measured on the basis of following parameters -

1. **Outreach of KVK in the district-** The document contains the details of villages covered by KVKs in the state through various activities intensively and extensively through various activities of KVK like demonstrations, training and other extension activities.
2. **Women empowerment activities-** This document containes the detailed activies done by the KVK's under Zone-VII on empowerment of women through different allied activities for increasing the women work efficiency, saving in women's labourers cost, easiness of operation to small scale implements, overall income of farm women's drudgery reduction.
3. **Activities on Secondary Agriculture-** This documents contains the detailed activities done by the KVK's under Zone-VII on Secondary Agriculture (like-value addition, wormicompost, Lac cultivation, sericulture activities) and their impact on over all out come of the farmers.
4. **Footfall of farmers -** This document contains the detailed list of farmers and other related persons visited the KVK's and benefited them under Zone-VII in mutual and interactive mode.
5. **Drudgery reduction-** This document containes the detailed activies done by the KVK's under Zone-VII drudgery reduction of farm women through different allied activities throgh different implements and techniques for increasing the women work efficiency, saving in women's labourers cost, easiness of operation to small scale implements, overall income of farm women's resulting drudgery reduction.
6. **Service provider-** This document contains the detailed list of service provider related to inputs and input dealers, farm machinaries repairing, under Zone-VII.
7. **Groth rate based activities -** This document contains the detailed activities done by the KVK's under Zone-VII and what growth rates are achieved and what growth rates are targated for different crops and enterprises.

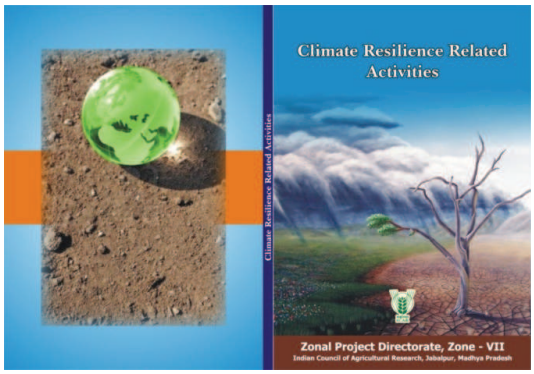


8. Crop Planning for Climate Resilience in Rainfed Agriculture

Each KVK were asked to propose the crop planning and technical interventions for the climatic condition viz. normal, delayed monsoon, dry spell/drought and flood/cyclones matching to their district. After getting the documents from KVK it was vetted with the experts of that region through organizing the interface with them by ZPD Zone VII.

8.


ICAR
Approach for Millions
Agricultural Roadmap for 12th Plan
Zonal Project Directorate, Zone - VII
Indian Council of Agricultural Research, Jabalpur, Madhya Pradesh


Climate Resilience Related Activities
Zonal Project Directorate, Zone - VII
Indian Council of Agricultural Research, Jabalpur, Madhya Pradesh


Climate Resilient
Crop Planning
Zonal Project Directorate, Zone - VII
Indian Council of Agricultural Research, Jabalpur, Madhya Pradesh

15. Sixth National Conference on KVK – 2011 at Jabalpur

Sixth National Conference on KVKs was organized by Agricultiural Extension Division, ICAR, New Delhi in befitting manner at Jawahar Lal Nehru Krishi Vishwa Vidayalaya, Jabalpur, Madhra Pradesh during 3-5th December, 2011. The theme of conference was Secondary Agriculture. About 1200 dignitaries (Scientists, Administrators, Directors, Policy makers, farmers) participated and benefited during the conference.

16. Awards and Recognition

Best KVK Award 2010: Out of 589 KVKs in the country; KVK Bastar under Zonal Project Directorate, Zone-VII, Jabalpur privileged with two prestigious awards on 16 July, 2010. On the occasion of Foudation Day of ICAR KVK, Baster was hounoured with the Best KVK Award.

Fakruddin Ali Ahmed Award-2010: Dr. S.C.Mukherjee Programme Coordinator, Krishi Vigyan Kendra, Bastar and his associates, Dr. U.S.Gautam, Zonal Project Director, Zonal Project Directorate, Zone-VII, Ratna Nashine, SMS, KVK, Bastar received Fahkruddin Ali Ahmad Award-2010 from Dr. S.Ayyappan, Secreatary, DARE and DG, ICAR.

Youg Scienitst Award: Indian Society of Extension Education, New Delhi conferred Young Scientist Award to Dr.S.R.K.Singh, Senior Scientist (Ag Extn), Zonal Project Directorate, Zone-VII, Jabalpur, in recognition of his outstanding work done in the field of extension research vis-à-vis extension services during September 27-29, 2011 in the Nationl Seminar-2011 on "Innovative Extension Approaches for Enhancing Rural Household Income", held at Jawaharlal Nehru Krishi Vidyalaya, Jabalpur, M.P.

Jagjivan Ram Innovative Farmers Award-2010 (Zonal Level): Shri Rosanlal Vishwakarma-of district Narshingpur, MP was awarded

with Jagjivan Ram Innovative Farmer Award-2010 (Zonal) on 16 July, 2011 on the occasion of foundation day of ICAR, New Delhi.

Best Thesis Award:

NDRI, Karnal Conferred best Ph.D. Thesis award to Dr. R.K.Yogi, Scientist (AE) of ZPD, Zone-VII, Jabalpur, M.P.

Best KVK Award at Zonal level: Out of 100 KVKs in the Zone-VII, KVK, Jabalpur under Zonal Project Directorate, Zone VII, Jabalpur privileged with prestigious Awards on 3rd December, 2011 on the occasion of National Conference on KVKs for the excellent performance in transferring the income generating activities for self reliance of rural youths.The Zonal level best KVK award were given in the presence of Hon'ble Agriculture Minister Shri Sharad Powar and other cabinet & state Ministers.

RECOGNITION

KVK Exhibition Stalls of ZPD, Zone-VII conferred the first prize in the Global Cinference on Woment in Agriculture

Addressing the Valedictory Programme Her Excellency Smt. Pratibha Devisingh Patil, President of India, emphasized the Pratibha to empower women with new knowledge and skills to need to bring woment into the mainstream of agriculture development and reduce gender disparity. She was delivering valedictory address in the Global Conference on Women in Agriculture as Chief Guest. While appreciating the efforts of the National Agriculture Research System for bringing women in the fore front of agriculture research and development, President of India suggested forming of Mahila Kisan Mandals in every village to educate women on different aspects of agriculture and related activities. In this, water management would be essential, again an area where the role of women is crucial, and needs to be supported, she added. Smt. Patial hoped that the outcomes of this Conference will contribute to enhacing agricultureal production, and in bringing a transformation in the lives of women engaged in the sector. President of India conferred three best poster award and two best exhibiton stall award to participating women delegates, Exhibition stall of KVKs under Zonal Project Directorate, Zone-VII was conferred the first prize in the innovation Market place cum Exhibition during the Global Conferece on Women in Agriculture held at IARI Mela Ground New Delhi on 13-15th March, 2012 organised by ICAR and Asian Pacific Association of Agriclture Research Institutions for the cause of empowering women for inclusive growth in agriculture. The stall number-33 assigned for Chhattisgarh and Odisha KVKs jontly and selected for the award.

Interface of Parlimantary Standing Committee, Goveerment of India with Krishi Vigyan Kendras in Madhya Pradesh.

Indian Council of Agriculture Research organized Parliament Committee-KVK interface programme at Krishi Vigyan Kendra, Naktare, Raisen on 29th February, 2012, Shri Ajit Kandelwal, Chariman, KVK, Raisen welcomed the Chairman and the Members of Parlimentary Standing Committee. On this occasion, 23 KVKs of Madhya Pradesh set their exhibition stall which was inaugurated by Shri Basudeb Acharia, Chariman, Parliament Committee on Agriculture, Government of India. The 11 members Parliament Committee consisting of Shri Hukam Dev Naryan Yadav, Dhri Satyavart Chaturvedi, Shri Narayan Singh Amlabe, Shri.S.N.Islam, Shri N.B. Kachadiya, Shri N.N.Roy, Shri U. Kushwaha, Shri M.A. Khan, Shri B.P. Parmar, Shri S.B. Behera and Shri P.Das. The committee visited the stalls, interacted with farmers and appreciated the KVKs and progressive farmers for their innovation and field application. The KVKs also presented the achievements before the committee. Farmers who came from various districts of Madhya Pradesh raised the issues related to agriculture.

Chariman, Shri Acharia, Hon'ble member of Parliament suggested that three major components viz., production, value addition and income generation should be better streamlined for sustainable progress of the farmers. Shri Acharia appreciated the work of KVKs and suggested for additional KVKs in large districts. Dr. K.D. Kokate, DDG, ICAR, New Delhi briefed the singnificant achievements of KVKs in Madhya Pradesh and suggested that the nomenclature of the post of Subject Matter Specialists should be 'Scientist' and two more scientists, one-each of Agro-meteorology and Agri-business Management may be added in the KVK set up. DDG highlighted the need for further strengthening of the KVKs as well as Directorate of Extension during coming XII five year plan.

Dr.U.S.Gautam, Zonal Project Director facilitated the programme and proposed the Vote of Thanks. On this occasion, Dr. Pitam Chandra, Director, CIAE, Bhopal, Director of Extension Services, JNKVV, Jabalpur and RVSKVV, Gwalior, Shri R.K.Swai, Principal Secretary, Dept of Agriculture, Govt. of Madhya Pradesh, Dr. S.R.K.Singh, Dr.A.P.Dwivedi, Dr.Prem.Chand from the ZPD, Zone-VII and staff of KVK, Raisen were present.