ANNUAL REPORT

2013-14

भाकृअनुप
ICAR

ICAR- Zonal Project Directorate, Zone VII

Indian Council of Agricultural Research, Jabalpur, Madhya Pradesh

ANNUAL REPORT

2013-14

ICAR-Zonal Project Directorate, Zone VII

Indian Council of Agricultural Research,

Jabalpur, Madhya Pradesh- 482 004

Citation

Annual Report (2013-14). Zonal Project Directorate, Zone VII, Jabalpur

Compiled and Edited by

Dr. Anupam Mishra, Zonal Project Director, ZPD, Zone VII
Dr. U. S. Gautam, Principal Scientist, ZPD, Zone VII
Dr. S. R. K. Singh, Senior Scientist, ZPD, Zone VII
Dr. A. P. Dwivedi, Senior Scientist, ZPD, Zone VII
Dr. Prem Chand, Scientist, ZPD, Zone VII
Dr. Tushar Athare, Scientist, ZPD, Zone VII
Dr. A. K. Singh, Subject Matter Specialist, KVK, Sagar (M. P.)
Dr. Jai Singh, Subject Matter Specialist, KVK, Sidhi (M. P.)
Dr. Alka Singh, Home Scientist, KVK, Chhatarpur (M.P.)
Dr. D.K. Vani, I/c Programme Coordinator, KVK, Khandwa (M.P.)
Dr.M.K. Shrivastava, Programme Coordinator, KVK, Ratlam (M.P.)
Dr. Nityanand Das, Programme Coordinator, KVK, Jagatsinghpur (Odisha)

Assisted by

J.B. Shrivastava, Programme Assistant, KVK, Katni (M.P.)
Kishor Kumar, Programme Assistant, KVK, Korea (C.G.)
Gajendra Tandon, Programme Assistant, KVK, Jashpur (C.G.)
Nitesh Gupta, Programme Assistant, KVK, Chhindwara (M.P.)
Ritesh Vishwakarma, Programme Assistant, KVK, Badwani (M.P.)

Year of publication: 2014

Published by

Zonal Project Director
Zonal Project Directorate, Zone VII
ICAR, Jabalpur (MP)

CONTENTS

Executive Summary

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

KVKs under Zone VII conducted total 13,310 On Farm Trials on the twenty thematic areas and assessed 1,499 technologies. Number of OFT was 730, 246 and 523 in M.P., Chhattisgarh and Odisha, respectively. Total Number of trials was 6268, 1100 and 5942 in M.P., Chhattisgarh and Odisha, respectively.

For implementing the technology at wider scale, a total of 1844 FLDs were conducted on oilseeds, pulses, cereals, vegetables, cash crops, agro-forestry, millets and other important area covering the area of 5,810.19 ha.

Zonal Project Directorate organized 15 Knowledge Management meet in collaboration of ICAR institutes where 529 Subject Matter Specialists benefitted in the zone.

For regular knowledge-updating and imparting new skills 8,286 training courses were organized benefiting 224343 *participants.*

Total 1,10,276 Extension activities in the form of field days, Farmers fair, Farm advisory services, Exhibition, Film show etc. were organized for popularizing the technologies in the region which benefited 11,44,592 farmers and extension personnel in the Zone-VII.

Quality seeds and planting materials, to the tune of 33167.076 q seeds and 5395919 nos planting materials were produced by the KVKs of the Zone VII. In Zone VII, 139 SAC meetings were conducted.

KVKs of Zone analyzed 46,054 soil and 1056 water samples benefited 44276 farmers of 2064 villages. ICAR Zonal KVK award was conferred to KVK Kanker and Jagjivan Ram Abhinav Kisan Puraskar to a farmer Sri Dolamani Sahu and two best poster presentation awards also received by the ZPD Scientists.

कार्य सारांश

क्षेत्रीय परियोजना निदेशालय अंचल–7 के अन्तर्गत 100 कृषि विज्ञान केन्द्र है जो तीन राज्यों मध्यप्रदेश, छत्तीसगढ़ एवं उड़ीसा में स्थित है । विभिन्न कृषि विज्ञान केन्द्रों ने 20 विषयों पर आधारित कुल 1499 प्रक्षेत्र परीक्षण आयोजित कर कुल 13310 तकनीकों का मूल्यांकन किया । अंचल –7 में मध्यप्रदेश में 730, छत्तीसगढ़ मे 246 व ओडिशा में 523 प्रक्षेत्र परीक्षण आयोजित किए गए। जोन में कुल *6268* मध्यप्रदेश में, *1100* छत्तीसगढ़ मे एवं *5942* ओडिशा में परीक्षण आयोजित हुए।

इस अंचल के कृषि विज्ञान केन्द्रों द्वारा विभिन्न तिलहन, दलहन, अनाज, सब्जी, नगदी, कृषि वानिकी और कदन्न फसलों पर कुल 1844 अग्रिम पंक्ति प्रदर्शन आयोजित किये गये जो कि भागों पर 5810.19 हेक्टेयर क्षेत्र पर था ।

क्षेत्रीय परियोजना निदेशालय अंचल–7 के अन्तर्गत 15 ज्ञान प्रबंधन कार्यक्रम विभिन्न भारतीय कृषि अनुसंधान परिषद के संस्थानो के सहयोग से आयोजित किए गए जिसके अन्तर्गत 529 विषय वस्तु विशेषज्ञ लाभान्वित हुए।

कृषि विज्ञान केन्द्रों द्वारा कुल 6286 प्रशिक्षण कार्यक्रम आयोजित किये गये जिससे 224343 प्रशिक्षणार्थी लाभान्वित हुए जिसमें कृषक एवं महिलाएँ, ग्रामिण युवक, एवं प्रसार कार्यकर्ता शामिल थे ।

कृषकों द्वारा तकनीकों को विस्तृत रुप से अंगीकृत करने के लिए कुल 110276 प्रसार कार्यक्रम आयोजित किये गये जिसमें मुख्यतः किसान दिवस, किसान मेला, प्रदर्शनी, फिल्म, इत्यादि शामिल थे जिसके द्वारा 1144592 कृषक एवं विस्तारकर्मी लाभान्वित हुए ।

कृषि विज्ञान केन्द्रों द्वारा कुल 33167.076 कुन्तुल गुणवत्तापूर्ण बीज उत्पादन एवं 5395919 रोपण वस्तुएँ किये गये । जोन में कुल 139 वैज्ञानिक सलाहकर समिति की बैठक आयोजित की गई। कृषि विज्ञान केन्द्रों द्वारा मिट्टी एवं जल के नमूने का परीक्षण भी किया जाता है जिसमें अन्तर्गत 46054 मिट्टी एवं 1056 जल के नमूने का परीक्षण किया गया ।

1. Introduction

Zonal Project Directorate, Zone VII was upgraded in March 2009 from to earlier states of known as Zonal Coordinating Unit. It was 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	51	39	07	01	47
Odisha	30	31	0	02	33**
Total	**108**	**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 the 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 specific 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

1.2 Agro-climatic Zones (ACZ) 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 1.2: Agro-climatic Zones under Zone-VII

State	Agroclimatic Zones (ACZ)	KVKs	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 ACZs**		**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 ACZs**		**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 ACZs**		**33**

1.3. Thrust Areas for the KVKs under Zonal Project Directorate VII

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

i. Sustainable production system through location-specific assessment and demonstrations of technology.
ii. Resource conservation through watershed management, soil and water conservation and proper farm mechanization.
iii. Development and promotion of crop and enterprise diversification and alternate land use system.
iv. Integrated pest and disease management.
v. Promoting rural entrepreneurship in livestock, goatery, poultry, fishery, mushroom, etc. by production, processing, value addition and marketing for higher income.
vi. Empowerment of farmwomen and youth through income generating activities and reduction of drudgery.
vii. 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 1499 technologies were tested in the zone through 13310 different trials (Table 2.1). The highest number of technologies were tested in the state of Madhya Pradesh (730) followed by Odisha (523) and Chhattisgarh (246) as the number of KVKs are also in the same order. The average numbers of technologies tested per KVK in the Zone 14.74 technologies were tested by each KVK. Average numbers of technologies tested per KVK were 12.30 in the state of Chhattisgarh, 15.04 in Madhya Pradesh and 15.78 in Odisha.

Table 2.1: State wise overall technology assessed during 2013-14

State	No. of technology assessed	No. of Trials
Madhya Pradesh	730	6268
Chhattisgarh	246	1100
Odisha	523	5942
Total	**1499**	**13310**

State wise overall technology assessed during 2013-14

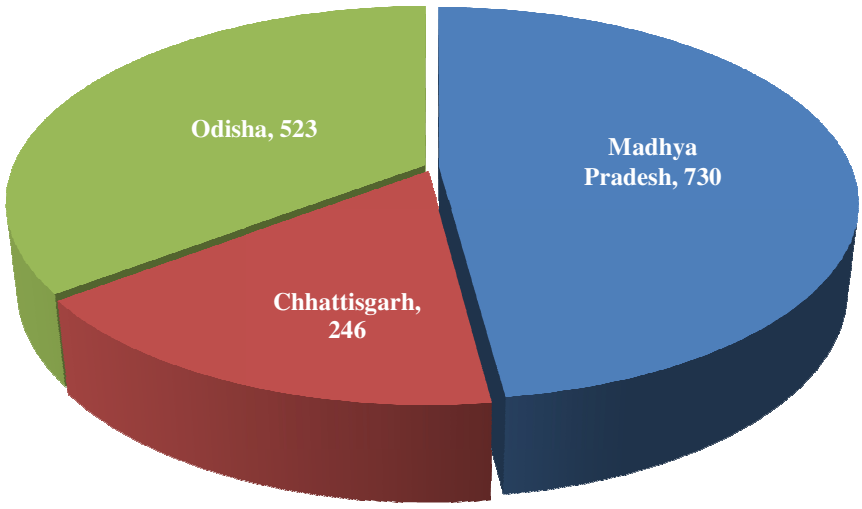


Table 2.2: Category wise OFTs conducted on crops

Crop Category	No of technology assessed				No of Trials			
	MP	CG	Odisha	Total	MP	CG	Odisha	Total
Cereal	126	76	77	279	697	320	943	1960
Vegetable	96	46	96	238	957	199	668	1824
Pulse	101	26	20	147	526	113	247	886
Oilseed	91	12	28	131	469	51	343	863
Spice	61	11	27	99	355	45	278	678
Fruit	18	1	18	37	97	4	191	292
Millet	6	4	6	16	30	16	78	124
Tuber	9	3	4	16	45	14	49	108
Intercropping	4	1	9	14	18	4	87	109
Agroforestry	5	0	8	13	24	0	78	102
Fodder	5	1	4	10	25	4	43	72
Plantation	3	0	6	9	31	0	52	83
Fibre	4	0	4	8	25	0	49	74
Sugar	1	1	6	8	5	4	53	62
Medicinal	3	0	4	7	15	0	52	67
Flower	4	1	2	7	19	4	26	49
Total	**537**	**183**	**319**	**1039**	**3338**	**778**	**3237**	**7353**

Category wise OFTs conducted on crops

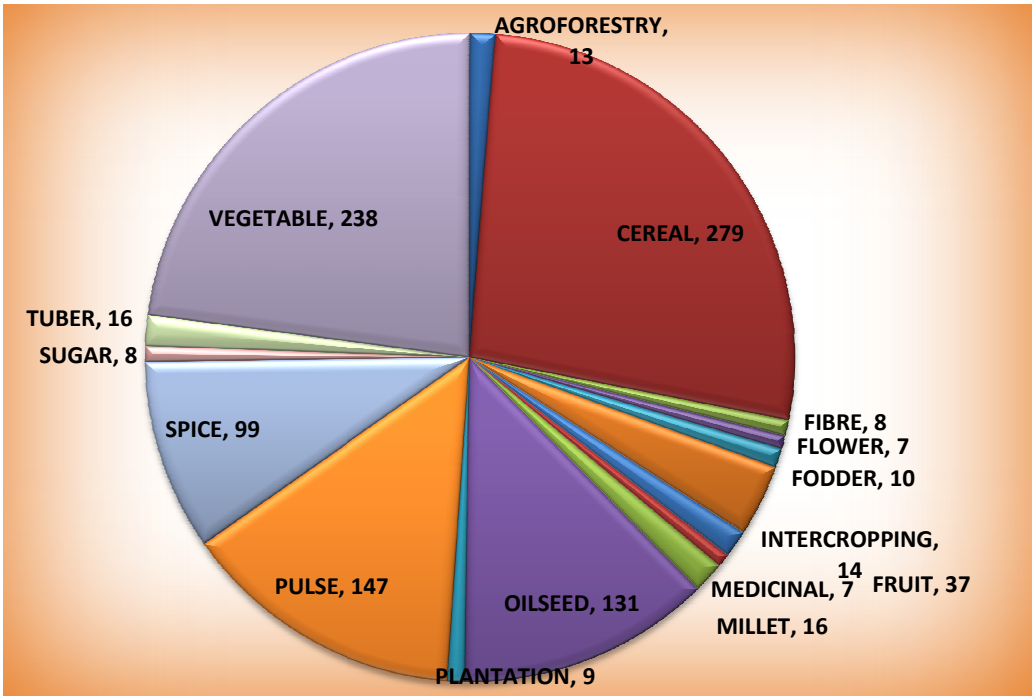


Table 2.3: Thematic area -wise OFTs conducted on crops

Thematic area	No of technology assessed				No of trails			
	MP	CG	Odisha	Total	MP	CG	Odisha	Total
Varietal Evaluation	179	42	81	302	997	183	771	1951
Integrated Nutrient Management	99	34	86	219	503	144	910	1557
Integrated Pest Management	71	30	48	149	369	131	536	1036
Integrated Disease Management	52	11	38	101	276	46	390	712
Weed Management	51	17	23	91	703	71	237	1011
Integrated Crop Management	23	41	7	71	135	171	91	397
Resource Conservation Technology	30	6	19	55	179	26	137	342
Crop diversification	13	0	4	17	81	0	52	133
Agroforestry	5	0	8	13	24	0	78	102
Integrated Farming System	5	2	5	12	25	6	35	66
Integrated Plant Nutrient Management	9	0	0	9	46	0	0	46
TOTAL	**537**	**183**	**319**	**1039**	**3338**	**778**	**3237**	**7353**

Thematic area- wise OFTs conducted on crops

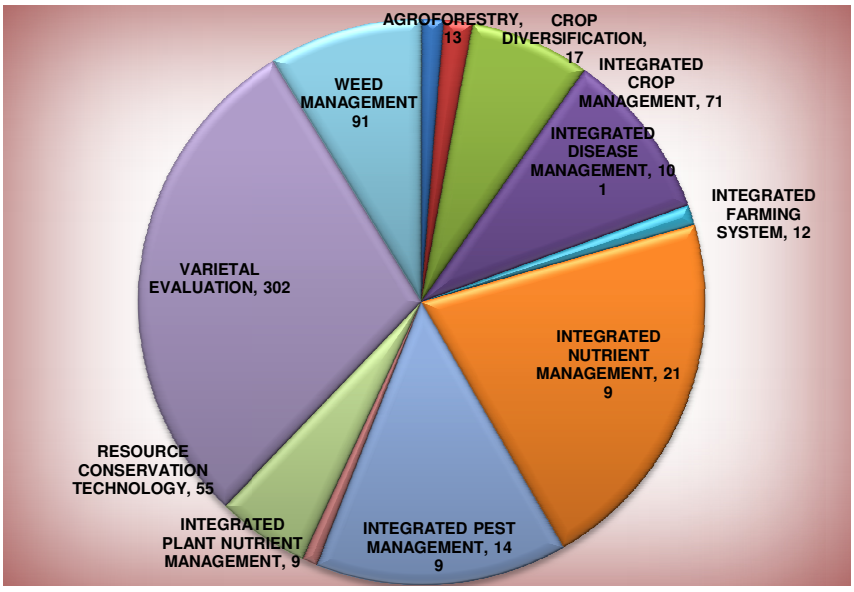
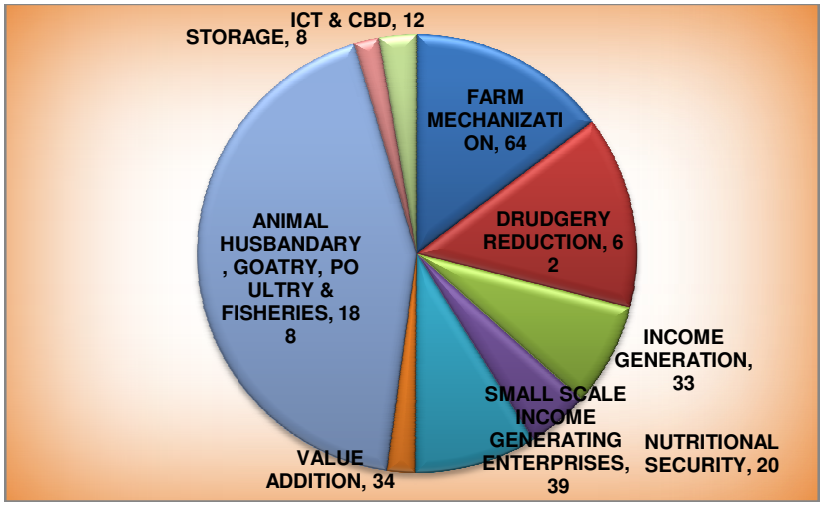


Table 2.8: Thematic area wise number of technologies assessed on enterprises

Thematic Area	No of Technologies				No of Trials			
	MP	CG	Odisha	Total	MP	CG	Odisha	Total
Animal Husbandary, Goatry, Poultry & Fisheries	78	27	83	188	867	101	630	1598
Farm Mechanization	32	14	18	64	163	59	194	416
Drudgery Reduction	31	2	29	62	168	8	326	502
Small Scale Income Generating Enterprises	4	1	34	39	34	3	338	375
Value Addition	12	6	16	34	64	64	168	296
Income Generation	18	3	12	33	90	20	118	228
Nutritional Security	5	9	6	20	30	62	70	162
ICT & Capacity Building	11	0	1	12	1504	0	25	1529
Storage	2	1	5	8	10	5	52	67
Total	**193**	**63**	**204**	**460**	**2930**	**322**	**1921**	**5173**

Thematic Area wise OFTs conducted on Enterprises



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:

Varietal Evaluation

1. Varietal Assessment in Paddy

Problem identified: **Low yield due to use of medium duration variety because of moisture stress during dry spell in rainfed condition**

Technology Assessed: **Assessment of improved variety Sahbhagi of paddy**

Use of of under rainfed situation appropriate varieties for enhancing is most important factors responsible for enhancing productivity of paddy at farmers' field. With the use of improved early variety, the productivity of the crop can be increased. Keeping this in

view, KVK Bastar, Boudh, Ganjam-II, Kandhamal, Kendrapara, Sidhi, Sundargarh-II and Umaria conducted 89 trials to assess the performance of the improved early variety Sahbhagi of paddy. The results showed that the yield was 33.99 per cent higher over the farmers' local varieties. The number of effective tillers/plant was recorded higher by 87.45 per cent. The net return and BC ratio was found Rs 11,005 per ha and 0.37 additional with this variety as compared to the farmers variety.

Table: Performance of improved paddy variety Sahbhagi

Details	No. of trials	Yield (q/ha)	No. of effective tiller/hill	Net Return (Rs/ha)	BC Ratio
Medium duration varieties under rainfed situation (Farmers' practices)	89	29.60	11	16619	1.90
Improved early variety Sahbhagi (Recommended practice)		39.66	20.62	27624	2.27

OFT on Paddy (Sahbhagi Dhan)

Problem identified: Low yield due to use of medium duration variety because of moisture stress during dry spell in rainfed condition

Technology Assessed: Assessment of improved variety Danteshwari of paddy

KVK Balaghat and Seoni of the zone conducted 10 trials to assess the performance of the variety Danteshwari of paddy. The results showed that the yield of this variety was 14.65 per cent higher over the farmers' local varieties. The net return and BC ratio was found Rs 6,578 per ha and 0.32 additional with this variety as compared to the farmers variety, respectively. The assessed variety was harvested 31 days early and gave very good performance in rainfed situation.

Table: Performance of improved paddy variety Danteshwari

Details	No. of trials	Yield (q/ha)	Maturity (Days)	Net Return (Rs/ha)	BC Ratio
Medium duration varieties under rainfed situation (Farmers' practices)	89	36.03	135	31125	2.36
Improved early paddy variety Danteshwari (Recommended practice)		41.31	104	37703	2.68

Problem identified: Low yield due to yield lossess of local varieties during dry spell

Technology Assessed: Assessment of improved variety of paddy Indira Barani Dhan 1 in drought prone condition

The productivity of the crop can be increased. KVK Bhatapara, Dantewada and Rajnandgaon conducted 13 trials to assess the performance of variety Indira Barani Dhan 1. Results showed that the yield of this variety was 21.65 per cent higher over the farmers' local varieties. The number of tillers/hill was recorded higher by 43.72 per cent. The net return and BC ratio was found Rs 4351 per ha and 0.20 higher with this variety as compared to the farmers local variety. The variety gave very good performance in rainfed situation.

Table: Performance of improved paddy variety Indira Barani Dhan 1

Details	No. of trials	Yield (q/ha)	No. of tillers/hill	Net Return (Rs/ha)	BC Ratio
Local varieties Bhata and Sathia (Farmers' practices)	13	23.70	6.13	15029	1.78
Improved paddy variety Indira Barani Dhan 01 (Recommended practice)		28.83	8.81	19380	1.98

2. Varietal Assessment in Soybean

Problem identified: Low yield of soybean due to use of old variety

Technology Assessed: Assessment of soybean variety RVS-2001-4

KVK Ashoknagar, Dewas, Ujjain and Sehore conduced on farm trial to assess the performance of soybean variety RVS-2001-4. The results of the assessment showed that the variety gave 35.36 per cent higher production over the old variety JS 335/Sonia. The pods per plant were also increased by 14.18 per cent. The economic analysis showed that the net return was Rs 12,658 per ha additional with this variety. This variety is noticeably adopted by the farmers in the districts of western Madhya Pradesh.

Table - Performance of soybean variety RVS-2001-4

Details	No. of trials	Yield (q/ha)	No. of pods/plant	Net Return (Rs/ha)	BC Ratio
Soybean variety JS 335/ Sonia (Farmers' practices)	21	12.16	33.07	21402	2.18
Soybean variety RVS-2001-4 (Recommended practice)		16.46	37.76	34060	2.61

OFT on Soybean variety RVS 2001-4

3. Varietal Assessment in Wheat

Problem identified: **Low yield of wheat due to use of old varities like Lok 1**

Technology Assessed: **Assessment of improved variety of wheat RVW 4106 in irrigated condition**

Among the various factors responsible for low productivity of wheat at farmers' field, use of seeds of local/ old varieties is most important. Keeping this in view, KVK Bhopal, Bhind, Gwalior, Neemuch and Sheopur conducted on farm trials to variety RVW 4106 of wheat. Results showed that the yield was 16.53 per cent higher over the farmers' old variety. The number of effective tillers per plant was recorded higher by 24.56 per cent. The net return and BC ratio was found Rs 8,385 per ha and 0.73 additional with this variety as compared to the farmers variety, respectively.

Table: Performance of improved wheat variety RVW 4106

Details	No. of trials	Yield (q/ha)	No. of effective tiller/plant	Net Return (Rs/ha)	BC Ratio
Wheat old varieties Like Lok 1 (Farmers' practices)	28	41.08	11.4	42503	2.60
Improved wheat variety RVW 4106 (Recommended practice)		47.87	14.2	50888	3.33

Wheat variety RVW-4106

Problem identified: **Low yield of wheat due to use of old varities like Lok 1**

Technology Assessed: **Assessment of improved variety of wheat HI 1544 in irrigated condition**

KVK Burhanpur, Khargone, Ratlam and Shajapur conducted 20 trials to assess the performance of the improved variety HI 1544 of wheat. The results showed that the yield of this variety was 19.62 per cent higher over the farmers' old variety. The number of effective tillers per plant was recorded higher by 52.56 per cent. The net return and BC ratio was found Rs 9,501 per ha and 0.35 additional with this variety as compared to the farmers variety, Lok 1.

Table: Performance of improved wheat variety HI 1544

Details	No. of trials	Yield (q/ha)	No. of effective tiller/plant	Net Return (Rs/ha)	BC Ratio
Wheat old varieties like Lok 1 (Farmers' practices)	20	38.27	7.8	37468	3.11
Improved wheat variety HI 1544 (Recommended practice)		45.78	11.9	46969	3.46

Wheat variety HI 1544

Problem identified: **Low yield of wheat due to use of old varities like Lok 1**

Technology Assessed: **Assessment of improved variety of wheat HI 8663 in irrigated condition**

Low productivity of wheat at farmers' field is due to use of seeds of local/ old varieties by them. Keeping this in view, KVK Dewas, Harda and Shajapur of the zone planned and conducted 16 trials to assess the performance of the improved variety HI 8663 of wheat. The results showed that the yield of this variety was 27.41 per cent higher over the farmers' old variety. The number of effective tillers per plant was recorded higher by 41.86 per cent. The net return and BC ratio was found Rs 11,906 per ha and 0.35 additional with this variety as compared to the farmers variety, respectively. The variety gave very good performance in irrigated situation.

Table: Performance of improved wheat variety HI 8663

Details	No. of trials	Yield (q/ha)	No. of effective tiller/plant	Net Return (Rs/ha)	BC Ratio
Wheat old varieties like Lok 1 (Farmers' practices)	16	42.58	8.6	39582	2.98
Improved wheat variety HI 8663 (Recommended practice)		54.25	12.2	51488	3.33

Problem identified: **Low yield of wheat due to use of old varieties like – Lok 1**

Technology Assessed: **Assessment of improved variety of wheat MP 1203 under late sown condition**

With the use of improved variety, the productivity of the crop can be increased. Keeping this in view, KVK Hoshangabad, Raisen and Rewa conducted trials to assess the performance of MP 1203. Results showed 28.09 per cent higher yield over the farmers' local variety Lok 1. Number of panicles/plant was recorded higher by 62.73 per cent. The net return and BC ratio was found Rs 11,296 per ha and 0.41 additional with this variety as compared to the farmers variety Lok 1, respectively. The variety gave very good performance in late sown condition.

Table: Performance of improved wheat variety MP 1203

Details	No. of trials	Yield (q/ha)	No. of panicles /plant	Net Return (Rs/ha)	BC Ratio
Wheat variety Lok 1 (Farmers' practices)	21	29.55	7.7	25932	2.20
Improved wheat variety MP 1203 (Recommended practice)		37.85	12.53	37228	2.61

Wheat variety MP 1203

4. Varietal Assessment in Maize

Problem identified: Low yield of hybrid maize due to use of unappropriate varities
Technology Assessed: Assessment of improved hybrid maize variety HQPM 1

Maize is important cereal crop grown in considerable area across the zone. With the use of improved hybrid variety, the productivity of the crop can be increased. KVK Kandhamal and Raisen of the zone planned and conducted on farm trials to assess the performance of the improved hybrid variety HQPM 1 of maize. The results showed that the yield of this variety was 72.45 per cent higher over the farmers' variety. The number of grains per cob was recorded higher by 42.26 per cent. The net return and BC ratio was found Rs 15,330 per ha and 0.74 additional with this variety as compared to the farmers variety, respectively. The variety gave very good performance, hence, recommended for the area.

Table: Performance of improved hybrid maize variety HQPM 1

Details	No. of trials	Yield (q/ha)	No. of grains/cob	Net Return (Rs/ha)	BC Ratio
Unappropriate maize hybrids (Farmers' practices)	18	23.30	286.8	12330	2.10
Improved hybrid maize variety HQPM 1 (Recommended practice)		40.18	408	27660	2.84

Hybrid Maize variety HQPM 1

5. Varietal Assessment in Mustard

Problem identified: Low yield of mustard due to use of old/traditional varieties Like Rohini
Technology Assessed: Assessment of improved variety of mustard RVM 2

It has been observed that with the use of improved variety, the productivity of the crop can be increased. Keeping above in view, KVK Guna and Morena of the Madhya Pradesh conducted trials to assess the performance of the RVM 2. Results showed 16.72 per cent higher yield over the farmers' old variety. The number of branches/plant was recorded higher by 18.74 per cent. The net return and BC ratio was found Rs 6,214 per ha and 0.18 additional with this variety as compared to the farmers old / traditional variety, Rohini. The variety gave very good performance in semi-irrigated situation.

Table: Performance of improved mustard variety RVM 2

Details	No. of trials	Yield (q/ha)	No. of branches/plant	Net Return (Rs/ha)	BC Ratio
Mustard old/traditional variety (Farmers' practices)	10	14.59	5.71	28079	2.57
Improved mustard variety RVM 2 (Recommended practice)		17.03	6.78	34293	2.75

6. Varietal assessment in Chickpea

Problem identified: Low yield of chickpea due to use of degenerated seeds of old and disease succeptible varieties
Technology Assessed: Assessment of chickpea variety JG 6

Various biotic & abiotic factors are responsible for the low yield of chickpea including pest and disease infestation. KVK Balaghat, Bhopal, Ratlam and Seoni conducted trials to assess the performance of the improved variety JG 6. Results showed that the yield of this variety was 27.22 per cent higher over the farmers' variety. The number of pods per plant was also increased by 34.27 per cent. Similarly the net return and BC ratio was also found to be higher by Rs 6,623 and 1.38 with this variety. The variety gave very good performance due to having tolerance to major pests and diseases.

Table: Performance of chickpea variety JG 6

Details	No. of trials	Yield (q/ha)	Pods/plant	Net Return (Rs/ha)	BC Ratio
Use of old varieties (Farmers' practices)	25	11.13	80.25	18097	1.94
Improved variety JG 6 (Recommended practice)		14.16	107.75	24720	3.32

Problem identified: Low yield of chickpea due to use of local/old veriety i.e. JG 315
Technology Assessed: Assessment of chickpea variety JG 14

Farmers are using local/old varieties which are mainly responsible for the low yield. KVK Balaghat, Betul, Harda, Mandla and Sidhi conducted 25 trials to assess the performance of the improved variety JG 14. Results showed that the yield of this variety was 41.16 per cent higher over the farmers' variety. The number of pods per plant was also increased by 54.56 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 9,177 and

0.63 with this variety. The variety gave very good performance due to having tolerance to major pests and diseases.

Table: Performance of chickpea variety JG 14

Details	No. of trials	Yield (q/ha)	Pods/plant	Net Return (Rs/ha)	BC Ratio
Local/old varieties like – JG 315 (Farmers' practices)	25	9.33	51.5	14004	2.06
Improved variety JG 14 (Recommended practice)		13.17	79.6	23181	2.69

Problem identified: Low yield of kabuli chickpea due to use of degenerated seeds of local/old verieties

Technology Assessed: Assessment of kabuli chickpea variety JKG 3

Yield of kabuli chickpea influenced by several factors like use of local/old variety, mixed seed, pest and disease infestation etc. KVK Ashoknagar, Dhar, Khargone and Sehore conducted trials to assess the performance of the improved kabuli chickpea variety JKG 3. Results showed 20.12 per cent higher yield over the farmers' variety. The number of pods per plant was also increased by 26.71 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 8,766 and 0.28 with this variety. The variety had good yield of seed and higher net profit per unit area.

Table: Performance of kabuli chickpea variety JKG 3

Details	No. of trials	Yield (q/ha)	Pods/plant	Net Return (Rs/ha)	BC Ratio
Unidentified/local/old varieties (Farmers' practices)	23	13.57	26.58	34156	3.00
Improved variety JKG 3 (Recommended practice)		16.30	33.68	42922	3.28

7. Varietal Assessment in Pigeon Pea

Problem identified: Low yield of pigeon pea due to use of medium duration variety affected by frost during seed setting/maturity

Technology Assessed: Assessment of pigeon pea early variety TJT 501

Unlike other legumes, Pigeon pea being a long duration crop, several factors are responsible for the low yield of pigeon pea. Farmers are using medium duration varieties which are usually affected by frost during winter season at the time pod filling/seed setting stage resulting low yield. KVK Balaghat, Seoni and Shahdol conducted 16 trials to assess the performance of the improved early variety TJT 501. Results showed that the yield of this variety was 25.29 per cent higher over the farmers' variety. Similarly the net return and BC ratio was also found to be higher by Rs. 11,770 and 0.37 with this variety. The variety performed well in the area, as it escaped from the frost due to early maturity.

Table: Performance of pigeon pea variety TJT 501

Details	No. of trials	Yield (q/ha)	Maturity (Days)	Net Return (Rs/ha)	BC Ratio
Farmers' variety - Asha (Farmers' practices)	15	12.97	180	26467	2.49
Improved early variety TJT 501 (Recommended practice)		16.25	155	38237	2.86

8. Varietal Assessment in Finger Millet

Problem identified: Low yield of finger millet due to incidence of blast in local varieties
Technology Assessed: Assessment of finger millet variety Indira Ragi 1

Among the finger millet local cultivars, blast incidence is a major problem which minimizes the yield of the crop. Farmers are using blast susceptible local varieties resulting in low yield. KVK Bastar and Dantewada conducted 7 trials to assess the performance of the improved blast resistance variety Indira Ragi 1. Results showed that the yield of this variety was 71.35 per cent higher over the farmers' variety. No blast incidence was observed with the assessed variety; however, in the farmers' variety incidence was noted to be 60 per cent. The net return and BC ratio was also found to be higher by Rs. 15,150 and 0.76 with the assessed variety.

Table: Performance of finger millet variety Indira Ragi 1

Details	No. of trials	Yield (q/ha)	Blast incidence (%)	Net Return (Rs/ha)	BC Ratio
Local variety (Farmers' practices)	7	9.25	60	15025	2.26
Improved variety Indira Ragi 1 (Recommended practice)		15.85	0	30175	3.02

9. Varietal Assessment in Fenugreek

Problem identified: Low yield of fenugreek due to use of local/unidentified varieties
Technology Assessed: Assessment of fenugreek variety RMT 305

Fenugreek leaves commonly used for vegetable purposes, however, it has been grouped under spices due to its seed which is used as a important spice. Farmers are using local/unidentified varieties which produces low yield. KVK Guna, Ratlam and Ujjain conducted trials to assess the performance of the improved variety RMT 305. The results showed that the yield of this variety was 30.73 per cent higher over the farmers' variety. Number of pods per plant also increased by 35.24 per cent in the assessed variety. Similarly the net return and BC ratio was also found to be higher by Rs. 10146 and 0.55 with this variety.

Table: Performance of fenugreek variety RMT 305

Details	No. of trials	Yield (q/ha)	Pods/ plant	Net Return (Rs/ha)	BC Ratio
Local/unidentified variety (Farmers' practices)	15	12.43	29.65	28485	3.40
Improved variety RMT 305 (Recommended practice)		16.25	40.10	38631	3.95

10. Varietal Assessment in Okra

Problem identified: Low yield of okra due to use of YVMV succeptible varieties like Varsha
Technology Assessed: Assessment of okra variety Kashi Pragati

Several factors are minimizing the yield of okra, use of local or old variety seeds are most important one. Farmers are using old varieties like Varsha resulting low yield due to YVMV incidence. KVK Guna, Cuttuck and Narsinghpur conducted trials to assess the performance of the improved variety Kashi Pragati. The results showed that the yield of this variety was 27.24 per cent higher over the farmers' variety. Similarly the net return and BC ratio was also found to be higher by Rs. 19,565 and 0.28 with this variety.

Table: Performance of okra variety Kashi Pragati

Details	No. of trials	Yield (q/ha)	Net Return (Rs/ha)	BC Ratio
Farmers' variety – Varsha (Farmers' practices)	23	102.72	45037	2.79
Improved variety Kashi Pragati (Recommended practice)		130.70	64602	3.07

11. Varietal Assessment in Pea

Problem identified: Low yield of pea due to use of local/old variety
Technology Assessed: Assessment of pea variety PSM 3

Farmers are using local varieties resulting low yield of pea. KVK Ashoknagar and Janjgir-Champa conducted on farm trials to assess the performance of the improved variety PSM 3. Results showed that the yield of this variety was 32.32 per cent higher over the farmers' variety. The number of pods per plant was also increased by 47.39 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 14,255 and 0.61 with this variety.

Table: Performance of pea variety PSM 3

Details	No. of trials	Yield (q/ha)	Pods/ plant	Net Return (Rs/ha)	BC Ratio
Local variety (Farmers' practices)	10	39.60	13.40	29450	2.38
Improved variety PSM 3 (Recommended practice)		52.40	19.75	43705	2.99

12. Varietal Assessment in Capsicum

Problem identified: **Low yield due to lack of knowledge on high value and low volume crops and improved cultivation practices**

Technology Assessed: **Assessment of Capsicum variety California wonder**

Capsicum is a high value low volume vegetable usually grown in polyhouses as it requires low temperature for its optimum production. It may also be grown in open fields at favourable temperature required for the crop growth. Farmers are however, producing capsicum but they are getting low yield due to lack of knowledge on high value and low volume crops and improved cultivation practices. Looking the above problem on priority, KVK Kandhamal and Jajpur of zone planned and conducted on farm trials to assess the performance of the improved capsicum variety California Wonder with proper management practices. Results showed that the yield of this variety was 73.84 per cent higher over the farmers' variety. The number of fruits per plant and unit fruit weight was also higher by 68.09 and 21.42 per cent respectively. Similarly the net return and BC ratio was also found to be higher by Rs. 42568 and 0.50 with this variety. The variety gave very good performance as the net profit considerably increased with this variety.

Table: Performance of capsicum variety California wonder

Details	No. of trials	Yield (q/ha)	Fruits/ plant	Unit fruit weight (gram)	Net Return (Rs/ha)	BC Ratio
Unidentified variety (Farmers' practices)	26	118.50	6.55	140	72240	2.19
Capsicum variety California wonder (Recommended practice)		206.00	11.01	170	114808	2.69

Capsicum variety California Wonder

13. Varietal Assessment in Chilli

Problem identified: Low yield of tomato due to use of old/traditional variety
Technology Assessed: Assessment of chilli variety Indira Chilli 1

Several factors are responsible for lowering the yield of chilli, use of old/traditional varieties are important one. KVK Gariyaband, Kawardha and Mahasamund of zone planned and conducted on farm trials to assess the performance of the improved variety Indira Chilli 1. Results showed that the yield of this variety was 15.66 per cent higher over the farmers' variety. Similarly the net return and BC ratio was also found to be higher by Rs. 30,450 and 0.39 with this variety. The variety performance very well in the area.

Table: Performance of chilli variety Indira Chilli 1

Details	No. of trials	Yield (q/ha)	Plants/m^2	Net Return (Rs/ha)	BC Ratio
Farmers' local / old variety (Farmers' practices)	10	123.9	4	115217	2.98
Improved variety Indira Chilli 1 (Recommended practice)		143.3	4	145667	3.37

Integrated Crop Management

Integrated Crop Management in Paddy

Problem identified: Low yield of tradionally transplanted paddy due to use of long duration varieties
Technology Assessed: Assessment of system of rice intensification with improved varieties

Among the various factors responsible for low productivity of paddy at farmers' field, traditional transplanting techniques and use of seeds of local/unidentified varieties is most important. With the use of improved variety with system of rice intensification (SRI) the productivity of the crop can be increased. KVK Chhindwara and Shahdol of zone planned and conducted on farm trials to assess the effect of system of rice intensification with improved varieties i.e. MTU 1010 and Swarna Sub 1 respectively on the performance of paddy. The results showed that the crop yield was 56.14 per cent higher over the farmers' practice. The panicles/m^2 was also increased by 45.19 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 16,150 and 0.51 with this technology. The technology is effective as it increases the crop yield and the net return per unit area.

Table: Impact of SRI with improved varieties on the performance of paddy

Details	No. of trials	Yield (q/ha)	Panicles /m^2	Net Return (Rs/ha)	BC Ratio
Traditional transplanting and use of local/unidentified varieties (Farmers' practices)	07	28.50	135	20600	2.25

Details	No. of trials	Yield (q/ha)	Panicles /m^2	Net Return (Rs/ha)	BC Ratio
System of rice intensification (transplanting of 10-12 days old nursery @ one seedling/hill) with improved varieties i.e. MTU 1010 and Swarna Sub 1 (Recommended practice)		44.50	196	36750	2.76

Problem identified: High seed rate and heavy weed infestation in late sown paddy

Technology Assessed: Assessment of improved management practices in low cost direct seeded paddy

Use of high seed rate coupled with heavy infestation of weeds in *biasi* system of paddy cultivation; sometimes crop fails due to drought situation occurred at the time of biasi. Keeping justified seed rate and proper time management of *biasi* the weed infestation can be lowered and production can be maximized. Keeping above problem on the priority, KVK Mahasamund and Raigarh (C.G.) of the zone planned and conducted on farm trials to assess the impact of improved management practices in biasi system of paddy cultivation. The results showed that the crop yield was 6.04 per cent higher over the farmers' practice and the weeds/m^2 reduced by 55.79 per cent over the farmers' practice. Similarly the net return and BC ratio was also found to be higher by Rs. 3616 and 0.23 with the proper management practices. This technology is effective as it increases the the crop yield and reduced the weed population.

Table: Impact of proper seed rate and improved management practices in biasi system of paddy cultivation

Details	No. of trials	Yield (q/ha)	No. of weeds/m^2	Net Return (Rs/ha)	BC Ratio
High seed rate in biasi system of paddy cultivation (Farmers' practices)	08	41.59	19.35	27865	1.51
Proper seed rate and management practices in biasi system of paddy cultivation (Recommended practice)		44.10	12.42	31481	1.74

Problem identified: Field remains fallow during rabi after long duration paddy

Technology Assessed: Assessment of rice based cropping system under limited irrigation condition during rabi season

Under the limited (one) irrigation condition, fields remains fallow during rabi season due to use of long duration varieties of paddy durig kharif. Use of early to medium (< 120 days duration) paddy varieties followed by chickpea during rabi under limited (one) irrigation the probelem can be managed. Keeping above problem on the priority, KVK Balrampur, Bilaspur and Narayanpur of the zone planned and conducted on farm trials to assess the impact of rice based cropping system under limited irrigation condition during rabi season. The results showed that the crop yield was 20.21 per cent higher over the farmers' practice and the effective tillers/m^2 inceased by 23.21 per cent over the farmers' practice. Similarly the net

return and BC ratio was also found to be higher by Rs. 11933 and 0.30 with the use of early to medium duration paddy. This technology is effective as it increases the the crop yield and chickpea can be successfully grown during rabi under limited irrigation condition.

Table: Impact of early to medium duration varieties on performance of paddy

Details	No. of trials	Yield (q/ha)	No. of effective tillers/m^2	Net Return (Rs/ha)	BC Ratio
Use of long duration paddy varieties (Farmers' practices)	13	32.16	280	19700	1.57
Use of early to medium duration varieties (Recommended practice)		38.66	345	31633	1.87

Integrated Crop Management in Tomato

Problem identified: Low seed germination, high seedling mortality and poor vigour due to unscientific method of seedling raising of tomato

Technology Assessed: Assessment of 'Pro Tray' for raising of seedlings for tomato cultivation

Nursery management and seedling raising is a important component of vegetable cultivation. Low seed germination, high seedling mortality and poor vigour is observed due to traditional seedling raising techniques. With the use of 'Pro Tray' nursery raising technique improved nursery can be prepared and vegetable production can be maximised. Keeping above problem on the priority, KVK Ujjain and Raisen (M.P.) of zone planned and conducted on farm trials to assess the impact of 'Pro Tray' technique for raising of seedlings for tomato cultivation. Results showed that the seedling survival was 36.40 per cent higher over the farmers' practice and the crop yield was 35.92 per cent higher over the farmers' practice. Similarly the net return and BC ratio was also found to be higher by Rs. 1,18,804 and 1.19 with this technology. The technology is effective as it increases the seedling survival and produces healthy seedlings which ultimately increase the crop yield and the net return per unit area.

Table: Effect of 'Pro Tray' for raising of seedlings on the performance of tomato

Details	No. of trials	Seedling survival (%)	Yield (q/ha)	Net Return (Rs/ha)	BC Ratio
Traditional nursery raising (Farmers' practices)	10	64.83	279.75	102826	2.91
'Pro Tray' technique for raising of tomato (Recommended practice)		88.43	380.25	221630	4.10

Problem identified: **Low yield due to flower drop and poor fruit setting**

Technology Assessed: **Assessment of plant growth regulators (NAA and GA 3) for fruit setting and control of flower drop in tomato hybrid var. Lakshmi**

Flower drop and less fruit setting observed in tomato which reduced the crop yield. With the use of plant growth regulators flower drop can be controlled and the production can be maximised. KVK Dantewada (C.G.) conducted trials to assess the effect of plant growth regulators (NAA and GA 3) on hybrid tomato var. Lakshmi. Results showed that fruit setting was 26.87 per cent higher over the farmers' practice and the crop yield was 39.38 per cent higher over the farmers' practice. Similarly the net return and BC ratio was also found to be higher by Rs. 54450 and 0.76 with this technology. The technology is effective as it increases the fruit setting which ultimately increase the crop yield and the net return per unit area.

Table: Impact of plant growth regulators (NAA and GA 3) for fruit setting and control of flower drop in tomato

Details	No. of trials	Fruit setting (%)	Yield (q/ha)	Net Return (Rs/ha)	BC Ratio
No use of plant growth regulators (Farmers' practices)	04	51.62	245.50	80525	2.90
Use of plant growth regulators - NAA and GA 3 (Recommended practice)		65.49	342.20	134975	3.66

Integrated Crop Management in Papaya

Problem identified: **Low yield of papaya due to poor management practices**

Technology Assessed: **Assessment of liquid fertilizers application and planting method in papaya Taiwan 786**

Planting method and fertilizer application influences the yield of the fruit plants. Improved planting technique and adequate fertilizer application can enhance the growth and yield of fruits. KVK Chhindwara conducted on farm trials to assess the effect of planting technique at 2x2 meter on ridges and fertigation through drip irrigation system in papaya var. Taiwan 786. Results revealed that the fruit yield was 152.56 per cent higher over the farmers' practice. Similarly the net return and BC ratio was also found to be higher by Rs. 5,84,000 and 0.83 with the technology. This technology is effective as it increases the the fruit yield and net return per unit area.

Table: Impact of planting method and fertigation on performance of papaya

Details	No. of trials	Yield (kg/plant)	Net Return (Rs/ha)	BC Ratio
Traditional Planting method (Farmers' practices)	05	780	348000	3.90

Details	No. of trials	Yield (kg/plant)	Net Return (Rs/ha)	BC Ratio
Planting at 2x2 meter on ridges and fertigation through drip irrigation system (Recommended practice)		1970	932000	4.73

Integrated Crop Management in Vegetable based cropping system

Problem identified: Less return from existing cropping system of Tomato-Bottle guard
Technology Assessed: Assessment of Bottle gourd-Raddish-Tomato cropping system

Cropping system has its significance in net profit per annum and maintaining soil fertility for sustainable agriculture. Suitable cropping system can inhance the crop yield as well as net return. Keeping above problem on the priority, KVK Sehore conducted on farm trials to assess the impact of Bottle gourd-Raddish-Tomato cropping system by replacing the existing cropping system of Tomato-Bottle guard. Results revealed that the cropping intensity increased by 50 per cent and the yield of tomato and bottleguard increased by 11.68 and 18.73 per cent respectively in addition to additional yield obtained from new crop. Similarly the net return and BC ratio was also found to be higher by Rs. 71,210 and 0.16 with the assessed cropping system. This cropping system is effective as it increases the yield and net return per unit area.

Table: Effect of Bottle gourd-Raddish-Tomato cropping system

Details	No. of trials	Yield (Q/ha)	Cropping Intensity (%)	Net Return (Rs/ha)	BC Ratio
Traditional cropping system of Tomato-Bottle gourd (Farmers' practices)	05	Tomato-428 Bottle gourd-395	200	253500	2.60
Bottle gourd-Raddish-Tomato cropping system (Recommended practice)		Tomato-478 Radish-208 Bottle gourd-469	300	324710	2.76

Integrated Crop Management in Chrysanthemum

Problem identified: Less return due to low market price of flowers
Technology Assessed: Assessment of date of planting of chrysanthemum

Market price of any produce depends upon the availability. Higher market price can be obtained by shifting the planting time. Keeping above aspect on the priority, KVK Bilaspur of the zone planned and conducted on farm trials to assess the impact of date of planting of chrysanthemum. The crop was transplanted in IInd week of October instead of end of the month to Ist week of November. Results revealed that the flower yield was 8.89 per cent higher over farmers practice. Similarly the net return and BC ratio was also found to be higher by Rs. 1,74,000 and 2.6 with the recommended practice due to better market price. This technology is effective as it increases the yield and net return per unit area.

Table: Impact of date of planting on the performance of chrysanthemum

Details	No. of trials	Yield (Q/ha)	Market price (Rs/kg)	Net Return (Rs/ha)	BC Ratio
Traditional planting (end of October to Ist week of November) (Farmers' practices)	04	90	40	310000	7.20
Planting time-IInd week of October (Recommended practice)		98	50 to 200	484000	9.80

Integrated Nutrient Management

Integrated Nutrient Management in Paddy

Problem identified: Low yield of paddy due to poor soil fertility and indiscriminate use of fertilizers

Technology Assessed: Assessment of brown manuring in Paddy

Imbalance/indiscriminate use of nutrients is one of the major reasons for declining the yield of paddy. Farmers are not using the organic sources for nutrient supplement; hence, the soil fertility is declining gradually. KVK Bhadrak, Nabrangpur and Puri conducted 39 on farm trials to assess the impact of brown manuring on the performance of paddy. Results showed that the crop yield was 13.19 per cent higher over the farmers' practice. As a result of brown manuring the weed population/m^2 also reduced by 119.87 per cent. The net return and BC ratio was also found to be higher by Rs. 4,437 and 0.14 with this technology. The technology is effective as it increases the crop yield, reduces the weed population and maintains the soil health and fertility.

Table: Impact of brown manuring on the performance of paddy

Details	No. of trials	Yield (q/ha)	Weed population/m^2	Net Return (Rs/ha)	BC Ratio
No brown manuring (Farmers' practices)	39	35.63	68.6	18526	1.76
Brown manuring with *sesbania* (Recommended practice)		40.33	31.2	22963	1.90

Problem identified: Nitrogen losses resulting low yield of paddy due to indiscriminate use of Nitrogenous fertilizers

Technology Assessed: Assessment of leaf colour chart (LCC) for management of nitrogen in paddy

Farmers are not using the balanced fertilizer application for N supplement; hence, nitrogen lossess occurs frequently in the soil. Keeping above problem on the priority, KVK Balasore, Deogarh and Ganjam-II of zone planned and conducted 39 on farm trials to assess the impact of leaf colour chart (LCC) for nitrogen management in paddy. Results showed that

the crop yield was 18.47 per cent higher over the farmers' practice. The number of effective tillers per plant was also higher by 10 percent in the assessed technology. The nitrogen management through LCC saved 19.6 kg nitrogen per hectare. The net return and BC ratio was also found to be higher by Rs. 4,695 and 0.11 with this technology. The technology is effective as it increases the crop yield, saves the nutrient, minimizes the N lossess and maintains the soil health and fertility.

Table: Impact of leaf colour chart (LCC) for nitrogen management on the performance of paddy

Details	No. of trials	Yield (q/ha)	No. of effective tillers/hill	Nitrogen saving (Kg/ha)	Net Return (Rs/ha)	BC Ratio
Nitrogen application as per traditional method (Farmers' practices)	39	34.11	10	0	12642	1.59
Nitrogen management through LCC (Recommended practice)		40.41	11	19.6	17337	1.70

Integrated Nutrient Management in Wheat

Problem identified: Low yield of wheat due to imbalanced/indiscriminate use of nutrients
Technology Assessed: Assessment of integrated nutrient management in wheat

Among the cereals, wheat crop ranks IInd in uptake of major nutrients. Imbalanced/indiscriminate use of plant nutrients are one of the major reasons for declining yield of wheat. Farmers are not using the organic resources for nutrient supplement and appling less/imbalanced use of fertilizers; hence, the soil fertility is declining gradually which significantly affeting the crop yield. Looking the above problem, KVK Datia, Guna, Shajapur, Sheopur, Khargone and Hoshangabad conducted 30 on farm trials to assess the INM (Biofertilizers-Azotobactor & PSB @ 5 g/kg as seed inoculation + NPK @ 100:60:40 kg/ha + 5 kg Zn/ha) on soil test value basis in wheat. Results showed that the crop yield was 28.68 per cent higher over the farmers' practice. The number of effective tillers per m^2 was also increased by 32.54 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 10,391 and 0.32 with the assessed technology. The technology is effective for irrigated situation as it increases the crop yield and maintains the soil health and fertility for sustainable crop production.

Table: Assessment of INM in irrigated wheat

Details	No. of trials	Yield (q/ha)	No. of effective tillers/ plant	Net Return (Rs/ha)	BC Ratio
NPKZn @ 41:46:0:0 kg/ha (Farmers' practices)	30	37.03	8.02	38620	2.90

Details	No. of trials	Yield (q/ha)	No. of effective tillers/ plant	Net Return (Rs/ha)	BC Ratio
Biofertilizers-Azotobactor & PSB @ 5 g/kg as seed inoculation + NPK @ 100:60:40 kg/ha + 5 kg Zn/ha (Recommended practice)		47.65	10.63	49011	3.22

Integrated Nutrient Management in Green Pea

Problem identified: Low yield due to imbalanced/indiscriminate use of fertilizers
Technology Assessed: Assessment of INM in greenpea

Green pea is an important pulse crop used for vegetable during rabi season. Imbalanced/indiscriminate use of major plant nutrients and no use of other essential nutrients are the major reasons for declining pod yield of green pea. Farmers are not using manures, potassium, sulphur and zinc containing fertilizers; hence, the status of the respective nutrients is decreasing in the soil which is affecting the nutrient uptake and crop yield. KVK Narsinghpur and Sagar conducted on farm trials to assess the response of INM and applied FYM @ 2 MT/ha + Biofertilizers (Rhizobium & PSB) @ 5 g/kg as seed inoculation + Use of NPKS @ 20:60:20:35 kg/ha + Zn 5Kg/ha on soil test basis in green pea. The results showed that the green pod yield was 35.19 per cent higher over the farmers' practice. The number of pods per plant was also increased by 46.39 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 30,673 and 0.88 with the assessed technology. The technology is effective for irrigated situation as it increases the crop yield and maintains the soil health and fertility for profitable crop production.

Table: Response of INM in green pea

Details	No. of trials	Pod yield (q/ha)	No. of pods/ plant	Net Return (Rs/ha)	BC Ratio
Use of NPKSZn @ 14:35:0:0:0 kg/ha (Farmers' practices)	10	78.85	19.4	70311	5.43
FYM @ 2 MT/ha + Rhizobium & PSB @ 5 g/kg as seed inoculation + NPKS @ 20:60:20:35 kg/ha + Zn 5Kg/ha (Recommended practice)		106.6	28.4	100984	6.31

Integrated Nutrient Management in Hybrid Maize

Problem identified: Low yield due to imbalance and inadequate dose of fertilizers
Technology Assessed: Assessment of nutrient management in hybrid maize

Maize is an important crop among the cereals grown across the zone. It consumes highest nutrient quantities among the cereals, oilseeds and pulses. Imbalanced/indiscriminate use of major plant nutrients and no use of secondary and micronutrients are the major reasons for declining yield of maize especially hybrids. Farmers are not using the potassium and zinc

containing fertilizers; hence, the status of these nutrients is decreasing in the soil which is affecting the crop yield. Looking the above problem on priority, KVK Guna, Harda, Narsinghpur and Rajgarh of zone planned and conducted on farm trials to assess the nutrient management in hybrid maize and applied NPKZn @ 120:60:40:05 kg/ha on soil test basis. Results showed that the seed yield was 30.85 per cent higher over the farmers' practice. The number of cobs per plant was also increased by 41.18 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 10,413 and 0.42 with the assessed technology. The technology is effective for rainfed/irrigated situation as it increases the seed yield and maintains the soil health and fertility for profitable crop production.

Table: Response of nutrient management in hybrid maize

Details	No. of trials	Yield (q/ha)	No. of cobs/ plant	Net Return (Rs/ha)	BC Ratio
NPKZn @ 68:30:0:0 kg/ha (Farmers' practices)	20	32.93	1.7	25644	2.44
NPKZn @ 120:60:40:05 kg/ha (Recommended practice)		43.09	2.4	36057	2.86

Sulpher Management in Mustard

Problem identified: **Low yield of mustard due to imbalanced application of fertilizer without sulphur**

Technology Assessed: **Assessment of response of Sulphur with soil test based nutrient management in Mustard**

Mustard is an important oilseed crop among the oilseeds grown across the zone. Imbalanced/indiscriminate use of major plant nutrients and no use of secondary and micronutrients are the major reasons for declining yield of mustard. Farmers are not using the sulphur containing fertilizers; hence, the status of this nutrient is low in the soil which is affecting the crop yield. Sulphur is responsible for increasing the oil content in the oilseeds. Looking the above problem, KVK Gwalior, Kandhamal, Ratlam and Sundargarh-II of zone planned and conducted 36 on farm trials to assess the response of sulphur with soil test based nutrient management in Mustard and applied this nutrient @ 40 kg/ha on soil test basis alongwith NPK @ 60:40:20 kg/ha in mustard. Results showed that the crop yield was 28.06 per cent higher over the farmers' practice. The number of siliqua per plant was also increased by 32.19 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 10,030 and 0.46 with the assessed technology. The technology is effective for Irrigated/semi-irrigated situation as it increases the crop yield and maintains the soil health and fertility for profitable crop production.

Table: Response of sulphur with soil test based nutrient management in mustard

Details	No. of trials	Yield (q/ha)	No. of siliqua/ plant	Net Return (Rs/ha)	BC Ratio
NPKS @ 13:35:0:0 kg/ha (Farmers' practices)	36	13.01	154.25	24308	2.39
NPK @ 60:40:20 kg/ha and Sulphur @ 40 kg/ha (Recommended practice)		16.66	203.90	34338	2.85

Sulphur Management in Soybean

Problem identified: Low yield of soybean due to sulphur deficiency

Technology Assessed: Assessment of response of sulphur in soybean

Soybean is an important oilseed crop grown in the black soils. Imbalanced/indiscriminate use of major plant nutrients and no use of secondary and micronutrients are the major reasons for declining yield of soybean. Farmers are not using the sulphur containing fertilizers; hence, the status of this nutrient is decreasing in the soil which is affecting the crop yield. Sulphur is responsible for increasing the oil content in the oilseeds. Looking the above problem, KVK Badwani, Jhabua, Ratlam, Raisen, Rewa and Sehore conducted 30 trials to assess the response of sulphur and applied this nutrient @ 20 kg/ha through bentonite sulphur on soil test basis in soybean. Results showed that the seed yield was 69.69 per cent higher over the farmers' practice. The number of pods per plant was also increased by 41.31 per cent with the assessed technology. Similarly the net return and BC ratio was also found to be higher by Rs. 7,386 and 0.54 with the assessed technology. The technology is effective as it increases the crop yield and maintains the soil health and fertility.

Table: Response of sulphur in soybean

Details	No. of trials	Yield (q/ha)	No. of pods/ plant	Net Return (Rs/ha)	BC Ratio
NPKS @ 13:35:0:0 kg/ha (Farmers' practices)	30	10.13	30.45	13860	2.06
Rhizobium & PSB @ 5 g/kg as seed inoculation + NPK @ 20:60:20 kg/ha and Sulphur @ 20 kg/ha (Recommended practice)		17.19	43.03	21246	2.60

Molybdenum Management in Chickpea

Problem identified: Poor nodulation causes low yield of chickpea due to no use of molybdenum

Technology Assessed: Assessment of response of molydenum in chickpea

Chickpea is an important pulse crop grown across the zone. Imbalanced/indiscriminate use of plant nutrients and no use of micronutrients especially molybdenum which is responsible for nodulation in roots for N fixing microorganisms are the major reasons for declining yield of chickpea. Farmers are not using molybdenum and applying imbalanced dose of NPK

fertilizers; hence, the status of these nutrients is declining in the soil which is otherwise affecting the crop yield. Looking the above problem on priority, KVK Badwani, Ratlam, Rewa, Sagar, Shahdol and Shajapur of zone planned and conducted on farm trials to assess the the response of molybdenum applied through ammonium molybdate @ 1.0 gram/kg seed as seed coating and basel application @ 1.0 kg/ha alongwith NPKZn and applied these nutrients @ 20:60:20:05 kg/ha on soil test basis in chickpea. Results showed that the crop yield was 25.13 per cent higher over the farmers' practice. The number of nodules and pods per plant were also increased by 28.04 and 36.98 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 6,624 and 0.27 with the assessed technology. The technology is effective as it increases the crop yield and maintains the soil health and fertility.

Table: Response of molybdenum in chickpea

Details	No. of trials	Yield (q/ha)	No. of nodules/ plant	No. of pods/ plant	Net Return (Rs/ha)	BC Ratio
No use of molybdenum and NPKZn @ 13:35:0:0 kg/ha (Farmers' practices)	30	9.03	48.7	38.80	16963	2.09
NPK @ 20:60:20 kg/ha +Zn @ 5 kg/ha + Use of Ammonium molybdate @ 1.0 gram/kg seed for seed coating + Basel application @ 1.0 kg/ha (Recommended practice)		11.30	62.1	53.15	23587	2.36

Integrated Nutrient Management in Chickpea

Problem identified: **Imbalanced use of fertilizers and poor and non effective nodulation causes low yield of chickpea**

Technology Assessed: **Assessment of response of molydenum and rhizobium inoculation on yield of chickpea**

Major reasons for declining yield of chickpea is the imbalance/indiscriminate use of plant nutrients and no use of rhizobium and micronutrients especially molybdenum which are responsible for nodulation in roots for N fixing activities by microorganisms. Farmers are not using rhizobium and molybdenum for seed inoculation and applying imbalanced dose of NPK fertilizers; hence, the status of these nutrients and beneficial microorganisms is declining in the soil which is otherwise affecting the crop yield. Looking the above problem, KVK Dhar, Ratlam, and Shajapur from Madhya Pradesh and Balrampur from Chhattishgarh conducted on farm trials to assess the the response of molybdenum applied through ammonium molybdate @ 1.0 gram/kg seed as seed coating, rhizobium @ 5 g/kg as seed innoculation alongwith NPKZn and applied these nutrients @ 20:60:20:05 kg/ha on soil test basis in chickpea. Results showed that the crop yield was 31.29 per cent higher over the farmers' practice. The number of nodules per plant was also increased by 136.6 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 8,432 and 0.38 with

the assessed technology. The technology is effective as it increases the crop yield and maintains the soil health and fertility.

Table: Response of molybdenum and rhizobium innoculation in chickpea

Details	No. of trials	Yield (q/ha)	No. of nodules/ plant	Net Return (Rs/ha)	BC Ratio
No use of molybdenum and NPKZn @ 13:35:0:0 kg/ha (Farmers' practices)	20	11.47	11.2	17743	2.39
NPK @ 20:60:20 kg/ha +Zn @ 5 kg/ha + Use of Ammonium molybdate @ 1.0 gram/kg seed for seed coating + rhizobium @ 5 gram/kg seed as seed innoculation (Recommended practice)		15.06	26.5	26175	2.77

Integrated Nutrient Management in Banana

Problem identified: **Small finger size at distal end reduces bunch size leads to low yield due to inadequate uptake of nutrients**

Technology Assessed: **Assessment of bunch feeding in banana**

Banana is an important fruit among the fruit crops grown across the zone. Imbalanced/indiscriminate uses of fertilizers and no use of organic sources are the major reasons for declining the yield and finger size of banana. Farmers are not using organic inputs and balanced dose of fertilizers; hence, the status of these nutrients is declining in the soil which is affecting fertility and soil health. Bunch feeding in banana may be an alternate to increase the finger size at distal end and in turn enhancement in fruit yield. KVK Bolangir and Cuttuck conducted on farm trials to assess the the effect of buch feeding in banana. Results showed that the fruit yield was 28.07 per cent higher over the farmers' practice. The number of fingers in one kg was recorded to be 7 in comparison to farmer's practice (8.5) which reflected that the bunch fed fingers are larger than farmers practice. The net return and BC ratio was also found to be higher by Rs. 1,29,775 and 0.60 with the assessed technology. The technology is effective as it increases the finger size and fruit yield of banana.

Table: Performance of bunch feeding in banana

Details	No. of trials	Fruit yield (q/ha)	No. of fingers/kg	Net Return (Rs/ha)	BC Ratio
No bunch feeding (Farmers' practices)	26	390.0	8.5	202725	2.5
Bunch feeding through slurry of pottasium sulphate 7 gm and cowdung 500 gm kept in a polythene (Recommended practice)		499.5	7.0	332500	3.1

Boron Management in Cauliflower

Problem identified: Low yield and small curds of cauliflower due to Boron deficiency

Technology Assessed: Assessment of Boron in cauliflower

Cauliflower yield is affected by a number of factors including seed, nursery, nutrient and crop management practices etc. Farmers are not applying balanced dose of fertilizers for major nutrients as well as boron, KVK Badwani, Hoshangabad, Jhabua, Khandwa, Khargone, Sheopur, Rayagada and Sundargarh-II conducted 56 on farm trials to assess the response of boron with RDF (NPK @ 120:60:60 kg/ha + Boron @ 1 kg/ha) on soil test basis in cauliflower. Results showed that the yield was 14.52 per cent higher over the farmers' practice. The unit curd weight and curd size also increased by 14.76 and 15.85 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 23,473 and 0.59 with the assessed technology. The technology is effective as it increases the yield and maintains the soil health and fertility.

Table: Effect of INM with boron on performance of cauliflower

Details	No. of trials	Yield (q/ha)	Curd size (cm)	Unit curd weight (gram)	Net Return (Rs/ha)	BC Ratio
NPK @ 46:58:0 kg/ha and no use of boron (Farmers' practices)	56	212.20	8.2	806	90277	2.85
NPK @ 120:60:60 kg/ha + Boron @ 1 kg/ha (Recommended practice)		243.02	9.5	925	113750	3.44

Problem identified: Poor curd quality and low yield of cauliflower due to nonjudicious nutrient management

Technology Assessed: Assessment of incubated biofertilizer in cauliflower

Lack of application of organic inputs and balanced dose of fertilizers for major nutrients; resulting in declining of this nutrients in soil which in turn affecting the crop yield. KVK Angul, Cuttuck and Deogarh conducted 56 on farm trials to assess the incubated biofertilizer (Incubation of Azotobactor and PSB @ 5kg each in 3 MT vermicompost for 48 hours and its application @ 100 g/pit + 75% N and 100% PK @ 120:60:60 kg/ha on soil test basis) in cauliflower. Results showed that the yield was 26.13 per cent higher over the farmers' practice. The unit curd weight and curd size also increased by 75.18 and 29.41 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 28,850 and 0.38 with the assessed technology. The technology is effective as it increases the yield and maintains the soil health and fertility.

Table: Effect of incubated biofertilizer on performance of cauliflower

Details	No. of trials	Yield (q/ha)	Curd size (cm)	Unit curd weight (kg)	Net Return (Rs/ha)	BC Ratio
NPK @ 46:58:0 kg/ha and no use incubated biofertilizer (Farmers' practices)	56	228.33	17	1.37	88150	2.49
Incubation of Azotobactor and PSB @ 5kg each in 3 MT vermicompost for 48 hours and its application @ 100 g/pit + 75% N and 100% PK @ 120:60:60 kg/ha (Recommended practice)		288	22	2.4	117000	2.87

Integrated Plant Nutrient Management

Integrated Plant Nutrient Management in Wheat

Problem identified: **Low yield of wheat due to imbalanced and inadequate use of fertilizers**

Technology Assessed: **Assessment of IPNM based STCR in wheat**

Cultivation of wheat in irrigated situation affected by several factors under crop management practices; imbalanced/inadequate uses of NPK fertilizers are the major reasons for declining yield of wheat. KVK Bhopal, Burhanpur, Dhar, Janjgir-Champa, Jhabua, Khandwa, Korea and Surguja of the zone conducted 39 on farm trials to assess the the response of Integrated Plant Nutrient Management (IPNM) based on Soil Test Based Crop Response (STCR) setting the target yield 45 q/ha. The NPK doses were calculated by STCR equation and accordingly the fertilizers were applied to supply the nutrients to crop as per requirement. Results showed that the yield was 29.51 per cent higher over the farmers' practice. The number of tillers per plant was also increased by 50 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 10,998 and 0.46 with the assessed technology. The technology is effective as it serves the purpose in getting the targeted yield with yield deviation from the target by less than 10 percent and maintains the soil health and fertility.

Table: Response of IPNM based STCR in wheat

Details	No. of trials	Yield (q/ha)	No. of effective tillers/plant	Net Return (Rs/ha)	BC Ratio
NPK @ 41:46:0 kg/ha (Farmers' practices)	39	30.94	8	27253	2.50
NPK as per STCR equation (Target yield 45 q/ha) (Recommended practice)		40.07	12	38251	2.96

Integrated Plant Nutrient Management in Soybean

Problem identified: **Low yield of soybean due to imbalanced and inadequate use of fertilizers**

Technology Assessed: **Assessment of IPNM based STCR in soybean**

Soybean cultivation is affected by imbalanced/inadequate uses of NPK fertilizers of these. Balance dose of NPK fertilizers not serve the purpose to get the desired yield, when the soils having low or very low soil fertility. Looking the problem, KVK Dewas and Dhar conducted 11 on farm trials to assess the the response of Integrated Plant Nutrient Management (IPNM) based on Soil Test Based Crop Response (STCR) setting the target yield 20 q/ha. The NPK doses were calculated by STCR equation and accordingly the fertilizers were applied to supply the nutrients to crop as per requirement. Results showed that the yield was 27.16 per cent higher over the farmers' practice. The number of pods per plant was also increased by 20 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 8,409 and 0.29 with the assessed technology. The considerable difference in achieving the target was occurred due to crop damage because of exessive rain during kharif 2013. The technology is effective as it serves the purpose in getting the targeted yield and maintains the soil health and fertility.

Table: Response of IPNM based STCR in Soybean

Details	No. of trials	Yield (q/ha)	No. of pods/plant	Net Return (Rs/ha)	BC Ratio
NPK @ 14:35:0 kg/ha (Farmers' practices)	11	11.60	51.5	14487	1.67
NPK as per STCR equation (Target yield 20 q/ha) (Recommended practice)		14.75	61.8	22896	1.96

Weed Management

Weed Management in Paddy

Problem identified: **Low yield of paddy due to heavy weed infestation**

Technology Assessed: **Assessment of bispyribac sodium for weed management in paddy**

In general, yield of paddy are decreased by 30-35% due to infestation of narrow and broad leaved grassy weeds. Farmers are not using herbicide on time for weed management effectively; hence the crop yield is adversely affected. KVK Datia, Ganjam-I, Harda, Korba, Kendrapara and Morena conducted on farm trials to assess the the response of bispyribac sodium 10 SC for weed management in paddy. Results showed that the yield was 28.58 per cent higher over the farmers' practice. The number of weeds per m^2 was reduced by 358.33 per cent. Similarly the net return and BC ratio was also found to be higher by Rs. 23,255 and 0.51 with the assessed herbicide.

Table: Response of bispyribac sodium for weed management in paddy

Details	No. of trials	Yield (q/ha)	No. of weeds/m^2	Net Return (Rs/ha)	BC Ratio
One mannual weeding (Farmers' practices)	45	31.21	110	40902	2.00
Use of bispyribac sodium 10 SC - 25 gram a.i./ha at 15-20 DAT (Recommended practice)		40.13	24	64157	2.51

Weed Management in Wheat

Problem identified: Low yield of wheat due to heavy weed infestation of mono and dicot weeds

Technology Assessed: Assessment of sulphosulfuron + metsulfuron methyl for weed management in wheat

Farmers are not following weed management practices due to which the wheat yield is adversely affected. Looking the above problem, KVK Gwalior, Korea, Raigarh and Shahdol conducted on farm trials to assess the the response of sulphosulfuron 75% WP (25 g a.i./ha) + metsulfuron methyl 5% WP (6 g a.i./ha) for weed management in wheat. Results showed that the yield was 32.50 per cent higher over the farmers' practice. The number of weeds per m^2 was reduced by 387.32 per cent with the assessed technology. The net return and BC ratio was also found to be higher by Rs. 13,594 and 0.70 with the assessed herbicides.

Table: Response of sulphosulfuron + metsulfuron methyl for weed management in wheat

Details	No. of trials	Yield (q/ha)	No. of weeds/m^2	Net Return (Rs/ha)	BC Ratio
One mannual weeding (Farmers' practices)	20	32.15	124.95	28657	1.98
Use of sulphosulfuron75% WP(25 g a.i./ha) + metsulfuron methyl 5% WP (6 g a.i./ha) at 25 DAS (Recommended practice)		42.60	25.64	42251	2.68

Problem identified: Low yield of wheat due to heavy weed infestation of mono and dicot weeds

Technology Assessed: Assessment of clodinifop + metsulfuron methyl for weed management in wheat

In general the yield of cereals decreased by 30-35% due to infestation of narrow and broad leaved grassy weeds. Farmers are not caring weed management practices; due to which the crop yield is adversely affected. Looking the above problem on priority, KVK Chhatarpur, Damoh, Dhar, Panna and Shahdol of the zone conducted on farm trials to assess the the response of clodinofop + metsulfuron methyl @ 400 g/ha for weed management in wheat. Results showed that the yield was 37.47 per cent higher over the farmers' practice. The number of weeds per m^2 was reduced by 450 per cent with the assessed technology. The

net return and BC ratio was also found to be higher by Rs. 16,404 and 0.59 with the assessed herbicides.

Table: Response of clodinofop + metsulfuron methyl for weed management in wheat

Details	No. of trials	Yield (q/ha)	No. of weeds/m^2	Net Return (Rs/ha)	BC Ratio
One mannual weeding (Farmers' practices)	25	27.78	181.5	25365	2.26
Use of clodinofop + metsulfuron methyl @ 400 g/ha at 25 DAS (Recommended practice)		38.19	33	41769	2.85

Weed Management in Groundnut

Problem identified: Low yield of groundnut due to heavy weed infestation
Technology Assessed: Assessment of Imzathyper for weed management in groundnut

KVK Sambalpur and Boudh of the zone conducted 26 on farm trials to assess the the response of Imzathyper for weed management in groundnut. Results showed that the yield was 22.02 per cent higher over the farmers' practice. The number of weeds per m^2 was also reduced by 204.7 per cent. The net return and BC ratio was found to be higher by Rs. 10,530 and 0.42 with the assessed herbicide.

Table: Response of imazathaper for weed management in groundnut

Details	No. of trials	Yield (q/ha)	No. of weeds/m^2	Net Return (Rs/ha)	BC Ratio
One mannual weeding (Farmers' practices)	26	16.35	129.5	19185	1.79
Use of Imzathyper 10% SL @ 100 gram a.i./ha (750 ml/ha)at 15-20 DAS (Recommended practice)		19.95	42.5	29715	2.21

Weed Management in Chickpea

Problem identified: Low yield of chickpea due to heavy weed infestation of narrow and broad leaved weeds
Technology Assessed: Assessment of Pendimethalin for weed management in chickpea

KVK Gwalior and Hoshangabad of the zone conducted 10 on farm trials to assess the response of Pendimethalin for as preemergence weed management in chickpea. The herbicide was applied @ 1.0 kg/ha within 48 hours of crop sowing. The results showed that the yield was 17.97 per cent higher over the farmers' practice. The number of weeds per m^2 was reduced by 846.6 per cent. The net return and BC ratio was found to be higher by Rs. 2,680 and 0.16 with the assessed herbicide.

Table: Response of Pendimethalin for weed management in chickpea

Details	No. of trials	Yield (q/ha)	No. of weeds/m^2	Net Return (Rs/ha)	BC Ratio
One mannual weeding (Farmers' practices)	10	7.68	42.6	7125	1.52
Use of Pendimethalin @ 1.0 kg/ha as pre-emergence (Recommended practice)		9.06	4.5	9805	1.68

Integrated Pest Management

Integrated Pest Management for pod borer in Chickpea

Problem Identified: Low yield of chickpea due to heavy infestation of pod borer

Technology Assessed: Assessment of Integrated management module for pod borer in chickpea

Pod borer in gram is a major pest responsible for heavy reduction (20-35%) in yield. KVK Dhar, Bhind in Madhya Pradesh and Kawardha, Dhamtari and Rajnandgoan in Chhattishgarh conducted on farm trial for assessing the integrated management module for pod borer in Chickpea. Result of the on farm trial showed that the yield was increased by 22.3% and insect infestation was decreased by 345.35 %.The av.no. of pod/plant ,net return and BC ratio were increased by 32.55, Rs. 3,991 per ha and 0.23 respectively . Farmers are satisfied to this technology for pod borer management and they realized that IPM modules in chickpea are better than only use of chemical insecticide.

Table : Performance of IPM module for Management of Pod borer in Chickpea

Details	No.of trials	Yield (q/ha)	Insect infestation (%)	No. of Pod/Plant	Net Return	BC Ratio
Indiscriminate use of insecticide (Farmer's Practices)	25	8.34	15.81	43	25200	2.03
Deep summer ploughing + Installation of 'T' shape bird perches @ 20/ha + application of HNPV @ 250 L.E./ ha + need based insecticide (Recommended practice)		10.2	3.55	57	31450	2.26

Integrated Pest Management for Thrips in Onion

Problem Identified: Low yield of onion due to heavy infestation of Thrips in onion

Technology Assessed: Assesment of Imidachloprid for management of Thrips in onion

KVK Sehore from Madhya Pradesh and Bastar from Chhattishgarh assessed the performance of Imidachloprid for effectively managing the thriphs. They also found it effective in minimizing thrips and reduced the insect infestation 507.69 % and increased the yield by 47.17%. The net return due to use of this technology increased by Rs. 80,304 per ha.

Farmers were satisfied with this technology for thrips management and they realized that imidachloprid is one of the best options for management thriphs. The farmers were involved through training, field day and field visit during the crop growth and at the time of harvesting.

Table : Performance of IPM for thrips management in Onion

Details	No.of trials	Yield (q/ha)	Net Return	Insect infestation (%)	BC Ratio
Indiscriminate use of insecticide (Farmer's Practices)	10	99.95	86937	13.22	2.89
Dipping of seedlings in Imidachloprid – 17.8 SL @ 3 ml / 10 lit water for 2 hour before transplanting + Spray of Imidachloprid -17.8SL @ 125 ml/ ha at ETL (30 Thriphs/plant) (Recommended practice)		147.1	167241	2.26	4.67

Integrated Pest Management for Fruit borer in Tomato

Problem Identified: Low yield of tomato due to high infestation of fruit borer

Technology Assessed: Assessment of Integrated pest management of fruit borer in tomato

Fruit and shoot borer in tomato is a major pest responsible for damaging the fruits and reduction in yield. KVK Harda, Rajgarh from Madhya Pradesh and Ganjam-I, Keonjhar from Odisha conducted on farm trials to manage the pest effectively. Application of Pheromone traps@ 10 /ha, Prophylactic spray of neem oil @ 1%, followed by indeqaocarb 75 g a.i. /ha at ETL was used for managing the pest. Result of the on farm trial showed that the yield was increased by 15.99 % and fruit damage was decreased by 227.88 %. The net return and BC ratio were increased by Rs. 30,870 per ha and 0.58 respectively. Farmers realised that IPM modules in tomato is better than only use of chemical insecticide.

Table : Performance of IPM for Fruit borer management in Tomato

Details	No.of trials	Yield (q/ha)	Net Return	Fruit damage (%)	BC Ratio
Indiscriminate use of insecticide (Farmer's Practices)	36	271.35	119980	17.05	2.57
Installation of Pheromone traps@ 10 /ha, Prophylactic spray of neem oil @ 1%, followed by indexocarb 75 g a.i./ha at ETL (Recommended practice)		314.75	150850	5.2	3.15

Integrated Pest Management for Diamond Back Moth in Cabbage

Problem Identified: Low yield of cabbage due to heavy infestation of diamond back moth

Technology Assessed: Assessment of Integrated diamond back moth management module in cabbage

Diamond back moth in cabbage is a major pest responsible for damaging the heads and reduction in yield. KVK Nabarangpur, Khandhamal from Odisha and Sidhi from Madhya Pradesh have conducted on farm trials to manage the pest effectively. One spray of *Bt* @ 1.0 kg/ ha in nursery + Transplanted at Proper spacing (60X 30 cm) + Spray of Neem oil @ 1.0 % at ETL + Spray of *Bacillus thuringiensis (* Bt) @ 1 kg/ha after 15 days of first spray was used for managing the pest. Result of the on farm trial showed that the yield was increased by 25.52% and number of larvae per plant was decreased by 207.69 %. The net return and BC ratio were increased by Rs. 980.0 per ha and 0.23 respectively.

Table: Performance of Integrated management module for diamond back moth in cabbage

Details	No.of trials	Yield (q/ha)	No. of larvae /plant	Net Return	BC Ratio
Indiscriminate use of insecticide (Farmer's Practices)	31	213	8.0	63925	2.58
One spray of *Bt* @ 1.0 kg/ ha in nursery + Transplanted at Proper spacing (60X 30 cm) + Spray of Neem oil @ 1.0 % at ETL + Spray of *Bacillus thuringiensis (* Bt) @ 1 kg/ha after 15 days of first spray (Recommended practice)		267.36	2.6	81800	2.81

Integrated Mangement of Girdle beetle in Soybean

Problem Identified: Low yield of Soybean due to heavy infestation of Girdle beetle

Technology Assessed: Assessment of Integrated management of girdle beetle in soybean

KVK Dindori, Rewa, Sagar, Sheopur and Tikamgarh from Madhya Pradesh conducted on farm trials for assessing the Integrated management of girdle beetle in soybean. Results showed that the yield was increased by 36.93% and insect infestation was decreased by 673.04 %. The net return and BC ratio were increased by Rs. 4,450.8 per ha and 0.29 respectively given in Table below.

Table: Performance of Integrated management of girdle beetle in soybean

Details	No.of trials	Yield (q/ha)	Net Return	Insect infestation (%)	BC Ratio
No use of chemical (Farmer's Practices)	22	6.39	6558.8	35.56	1.64
Deep summer ploughing + spraying of Trizophos 40EC @ 800 ml/ha after 40-DAS + 3-spraying of neem oil 50 ml @ 15 lit of water at 20 days interval (Recommended practice)		8.75	11009.6	4.6	1.93

Management of Brown Plant Hopper in Paddy

Problem Identified: Low yield of Paddy due to heavy infestation of brown plant hopper (BPH)

Technology Assessed: Assessment of Buprofenzin for management of BPH in Paddy

KVK Bolangir, Dhenkanal, Gajapati, Nayagarh, Jagatsinghpur from Odisha and Janjgir champa from Chhattishgarh, were conducted on farm trials for assessing the performance of Buprofenzin for management of BPH in paddy. Provision of alleyways of 30 cm width after every 2-3 meter in field + foliar spray of Buprofenzin- 25% SC@ 0.75-1.0 lit./ ha at ETL (10 insect/hill at vegetative stage while , 20 insect/ hill at post flowering stage) used for managing the pest. Results of the on farm trial showed that the yield was increased by 20.12% and no. of nymph and adult /hills was decreased by 296.34 %. The net return and BC ratio were increased by Rs. 5,946.8 per ha and 0.18 respectively given in Table beow.

Table: Performance of Buprofenzin for management of BPH in Paddy

Details	No.of trials	Yield (q/ha)	Net Return	Nymph & adult population /hill (No.)	BC Ratio
No use of chemical (Farmer's Practices)	63	36.63	20654.2	32.5	1.84
Provision of alleyways of 30 cm width after every 2-3 meter in field + foliar spray of Buprofenzin- 25% SC@ 0.75-1.0 lit./ ha at ETL (10 insect/hill at vegetative stage while , 20 insect/ hill at post flowering stage). (Recommended practice)		44.0	26601.0	8.2	2.02

Integrated Management of stem borer in Paddy

Problem Identified: Low yield of Paddy due to heavy infestation of stem borer

Technology Assessed: Assessment of Integrated management stem borer in Paddy

KVK Harda from Madhya Pradesh, Kawardha, Narayanpur, Rajnandgoan, from Chhattishgarh, Jajpur, Kandhamal, Kendrapada, Cuttack and Nabarangpur from Odisha were conducted an on farm trial for assessing the Integrated management of stem borer in paddy. Application of Fipronil 0.3G @ 33 kg/ha at 5 to 7 days before transplanting, Clipping of leaf tips of the seedlings at a time of transplanting , Foliar spraying of Indoxacarb 14.5 SC @ 75 a.i. /ha. at 30 and 60 DAT and installation of pheromone trap @ 20/ha ETL (5-10% dead hearts)used for managing the pest. Results of the on farm trial showed that the yield was increased by 20.12% and no. of nymph and adult /hills was decreased by 296.34 %. The net return and BC ratio were increased by Rs. 5,946.8 per ha and 0.18 respectively given in Table below.

Table: Performance of Integrated management of stem borer in paddy

Details	No. of trials	Yield (q/ha)	Net Return	Nymph & adult population /hill	BC Ratio
No use of chemical (Farmer's Practices)	63	36.63	20654.2	32.5	1.84
Application of Fipronil 0.3G @ 33 kg/ha at 5 to 7 days before transplanting in nursery + Clipping of leaf tips of the seedlings at a time of transplanting + installation of pheromone trap @ 20/ha+ Foliar spraying of Indoxacarb 14.5 SC @ 75 a.i. /ha at 30 and 60 DAT at ETL (5-10% dead hearts). (Recommended practice)		44.0	26601.0	8.2	2.02

Management of leaf minor in Tomato

Problem Identified: Low yield of Tomato due to heavy infestation of leaf minor

Technology Assessed: Assessment of Trizophos and Cyomaizine for management of leaf minor in tomato

KVK Balasore and Gajapati from Odisha were conducted on farm trial for assessing the performance of Trizophos and Cryomaicine against leaf minor in tomato. Application of one spray of Trizophos 40 EC@ 1.0 lit./ha followed by Cryomaicine 75 WP @ 400g/ha 15 days after Ist spray for managing the pest. Result of the on farm trial showed that the yield was increased by 29.94% and per cent leaf minor infestation was decreased by 190.6 %. The net return and BC ratio were increased by Rs. 29,330.0 per ha and 0.30 respectively given in Table below.

Table: Performance of Trizophos and Cyomaizine for management of leaf minor in tomato

Details	No. of trials	Yield (q/ha)	Net Return	Infestation (%)	BC Ratio
No use of chemical (Farmer's Practices)	26	197	77060	9.3	2.25
One spray of Trizophos 40 EC@ 1.0lit./ha followed by Cryomaicine 75 WP @ 0.25g/lit.of water 15 days after Ist spray (Recommended practice)		256.3	106390	3.2	2.55

Management of leaf minor in Tomato

Problem Identified: Low yield of chilli due to heavy infestation of sucking insect

Technology Assessed: Assessment of yellow sticky trap for management of sucking insect in chilli

KVK Jhabua from Madhya Pradesh and Bastar from Chhattisgarh were conducted on farm trials for assessing the performance of yellow sticky trap against sucking insect in chilli. Application of yellow sticky traps @ 15/ha for managing the sucking pest of chilli. Results of the on farm trial showed that the yield was increased by 21.15% and insect population / m^2

infestation was decreased by 184.6 %. The net return and BC ratio were increased by Rs. 22,383 per ha and 0.41, respectively given in Table.

Table: Performance of Yellow sticky trap for management of sucking insect in Chilli

Details	No. of trials	Yield (q/ha)	Net Return	Insect /m^2 (No.)	BC Ratio
No use of chemical (Farmer's Practices)	09	180.10	63195	7.4	2.07
Installation of Yellow sticky trap @ 15/ ha (Recommended practice)		218.2	85578	2.6	2.48

Integrated Disease Management

Blast in Paddy

Problem Identified: Low yield of paddy due to high incidence of blast disease
Technology Assessed: Assesment of tricyclozole for blast management in paddy

Incidence of blast severely damages the paddy crop especially in the old varieties. KVK Bijapur, Narayanpur from Chhatisgarh and Dhekanal, Jagatsinghpur from Odisha conducted on farm trials on blast management in paddy. Tricyclozole @ 0.06% was used for blast management. Results of the on farm trial showed that the yield was increased by 27.55 % and blast incidence was decreased by 309.23 %. The net return and BC ratio were increased by Rs. 1875 per ha and 0.36 respectively.

Table : Performance of tricyclozole for blast management in paddy

Details	No.of trials	Yield (q/ha)	Disease incidence (%)	Net Return	BC Ratio
Indiscriminate use of any fungicide after severe infestation (Farmer's Practices)	34	30.05	26.6	19618.75	2.16
Application of Tricyclozole @ 0.06% (Recommended practice)		38.33	6.5	21493.75	2.52

Wilt Management in Pigeon pea

Problem Identified: Low yield of pigeon pea due to severe incidence of wilt disease
Technology Assessed: Assessment of Integrated wilt management in pigeon pea

Remarkable reduction in yield has been observed due to heavy wilt incidence in pigeon pea. KVK Morena and Panna from Madhya Pradesh had conducted on farm trials on wilt management in pigeon pea. IDM module i.e. summer plaughing + seed treatment by Carboxin + Thiram @ 3 gram/kg seed + soil treatment with *Trichoderma viridae* @ 5 kg/ha with 50 kg vermicompost was assessed for wilt management. Results of the on farm trial showed that the yield was increased by 28.59 % and wilt incidence was decreased by 200 %. The net return and BC ratio were increased by Rs. 6119 per ha and 0.29 respectively.

Farmers were satisfied with this technology for wit management in pigeon pea and they realized that IDM module is only option for wilt management.

Table : Performance of Integrated wilt management module in pigeon pea

Details	No.of trials	Yield (q/ha)	Disease incidence (%)	Net Return	BC Ratio
No seed treatment / seed treatment with Thiram @ 2g/ kg seed (Farmer's Practices)	10	10.21	37.5	19257	2.11
summer ploughing + seed treatment by Carboxin + Thiram @ 3 gram/kg seed + soil treatment with *Trichoderma viridae* @ 5 kg/ha with 50 kg vermicompost (Recommended practice)		13.13	12.5	25376	2.40

Collar rot Management in Groundnut

Problem Identified: Low yield of ground nut due to high mortality of plant during seedling stage from collar rot

Technology Assessed: Assessment of Integrated management of collar rot in ground nut

Collar rot is a major disease, causes high mortality of seedlings which responsible for low yield of ground nut old susceptible varieties. Five KVK (Bargarh, Gajapati, Koraput, Nayagarh and Puri) from Odisha conducted on farm trials on collar rot management in ground nut. IDM module i.e. seed treatment by Carboxin(Vitavax) @ 2 /kg seed followed by soil treatment with *Trichoderma viridae* @ 5kg/ ha with 50 kg vermicompost and rouging and destroying the infected plants by burning outside the field assessed for collar rot management. Results of the on farm trial showed that the yield was increased by 38.80 % and disease incidence was decreased by 200.28 %. The net return and BC ratio were increased by Rs. 12,611 per ha and 0.42 respectively.

Table : Performance of Integrated management of collar rot in ground nut

Details	No.of trials	Yield (q/ha)	Plant mortality (%)	Net Return	BC Ratio
No seed treatment/treatment by any fungicide (Farmer's Practices)	65	11.7	20.9	15731.4	1.49
Seed treatment by Carboxin(Vitavax) @ 2 /kg seed followed by soil treatment with *Trichoderma viridae* @ 5 kg/ ha with 50 kg vermicompost and rouging and destroying the infected plants by burning outside the field (Recommended practice)		16.24	6.96	28342.4	1.82

Leaf curl Management in Chilli

Problem Identified: Low yield of chilli due to severe incidence (15-45%) of leaf curl disease in chilli

Technology Assessed: Assessment of IPM module for leaf curl management in chilli

KVK Damoh, Dhar, Harda, Sidhi from Madhya Pradesh and Jajpur from Odisha conducted on farm trials on leaf curl management in chilli. IDM module i.e. seed treatment with Thiomethaxom -75WG @3 g/ kg + One Spray of NSKE @ 5 % and one spray of Imidacloprid @ 125 ml/ ha before flowering at 15 days interval was assessed for leaf curl management. Result of the on farm trial showed that the green chilli yield was increased by 27.40 % and disease incidence was decreased by 138.61 %. The net return and BC ratio were increased by Rs. 49,498 per ha and 0.8 respectively. Farmers were satisfied with this technology for leaf curl management in chilli.

Table : Performance of IDM module for leaf curl management in chilli

Details	No.of trials	Yield (q/ha)	Disease incidence (%)	Net Return	BC Ratio
Spray of insecticides (Farmer's Practices)	33	155.58	21.07	113303	3.68
Thiomethaxom -75WG @3 g/ kg + One Spray of NSKE @ 5 % and one spray of Imidacloprid -17.8SL @ 125 ml/ ha before flowering at 15 days interval (Recommended practice)		198.22	8.83	162801	4.48

Mungbean Yellow Mosaic Viral Disease Management in Black gram

Problem Identified: Heavy yield reduction (up to 50%) of black gram due to severe incidence of Mungbean yellow mosaic virus disease in black gram

Technology Assessed: Assessment of Thiomethaxom for mungbean yellow mosaic disease in black gram

Yellow mosaic virus disease of black gram is a major disease causes up to 50 % yield loss in black gram due to use of susceptible varieties and non adoption of suitable integrated disease management module for management. KVK Ashok Nagar and Katni from Madhya Pradesh have conducted on farm trials on mungbean yellow mosaic virus (MYMV) management in black gram. MYMV management technology i.e. seed treatment with Thiomethaxom-75WS @3 g/ kg + one spray of Thiomethaxom-25WS @ 125 ml/ ha at early onset of disease was assessed for MYMV management. Results of the on farm trial showed that the black gram yield was increased by 43 % and disease incidence was decreased by 103.16 %. The net return and BC ratio were increased by Rs. 12,007.5 per ha and 0.64 respectively. Farmers were satisfied with this technology for MYMV management in Black gram.

Table : Performance Thiomethaxom for management MYMV in black gram

Details	No.of trials	Yield (q/ha)	Disease incidence (%)	Net Return	BC Ratio
Spray of insecticides (Farmer's Practices)	10	6.79	35.35	21927.5	2.61
Seed treatment with Thiomethaxom-75WG @3 g/ kg + One Spray of Thiomethaxom-25WG @ 125 ml/ ha at early onset of disease (Recommended practice)		9.71	17.4	33935.0	3.25

Leaf curl Management in Tomato

Problem Identified: Low yield of tomato due to severe incidence of leaf curl disease
Technology Assessed: Assessment of Imidachloprid for leaf curl management in tomato

Leaf curl in tomato is a major disease causes heavy yield loss in tomato due to use of susceptible varieties and nonadoption of suitable leaf curl management technology. KVK Balaghat from Madhya Pradesh and Sambalpur from Odisha have conducted on farm trials on leaf curl management in tomato. Leaf curl management technology i.e. seed treatment with seed treatment with Imidacloprid-70WS @5 g/ kg + One Spray of NSKE @ 5 % and one spray of Imidacloprid @ 125 ml/ ha before flowering at 15 days interval was assessed for leaf curl management. The result of the on farm trial showed that the tomato yield was increased by 27.45 % and disease incidence was decreased by 138.61 %. The net return and BC ratio were increased by Rs. 36,799.0 per ha and 0.85 respectively.

Table : Performance of IDM module for leaf curl management in Tomato

Details	No.of trials	Yield (q/ha)	Disease incidence (%)	Net Return	BC Ratio
Spray of insecticides (Farmer's Practices)	33	155.58	21.07	113303	3.68
Seed treatment with Imidacloprid-70WS @5 g/ kg + One Spray of NSKE @ 5 % and one spray of Imidacloprid @ 125 ml/ ha before flowering at 15 days interval (Recommended practice)		198.22	8.83	162801	4.48

Resource Conservation Technologies

Problem identified: Low yield due to late sowing and less return due to high cost of primary tillage
Technology Assessed: Assessment of zero tillage technique of wheat in rice-wheat cropping system

Rice-wheat is a major cropping system followed in the state of Madhya Pradesh. Use of long duration paddy varieties and non availability of proper soil moisture, the sowing of wheat delayed which resulting in low yield. Primary tillage increases the cost of cultivation and

sowing of rabi crop also delayed. KVK, Datia and Morena assessed zero tillage technology (Direct sowing of wheat by zero tillage technique by happy seeder after paddy harvest) to save time, residual soil moisture and cultivation cost. Results of these trials showed that the technique enhanced the yield of wheat by 13.14 percent and effective tillers per plant increased by 60.71 per cent. Cultivation cost of Rs. 1,800 also saved in zero tillage technique with increase in net return and BC ratio by Rs.10,045 and 0.57 compared to farmers' practice.

Table- Performance of zero tillage in wheat

Details	No. of trials	Yield (q/ha)	Effective tillers/plant	Cultivation cost saving (Rs/ha)	Net Return (Rs/ha)	BC Ratio
Wheat sowing after primary tillage (Farmers practice)	10	38.74	8.40	-	37329	2.29
Direct sowing of wheat after paddy harvest by happy seeder (Recommended practice)		43.83	13.50	1800	47374	2.86

Problem identified: Low yield due to lack of moisture and heavy weed infestation during early crop stage

Technology Assessed: Assessment of plastic mulching for weed management and moisture conservation in Tomato

Tomato is a huge water demanding vegetable commonly grown across the zone. Non availability of proper soil moisture and heavy weed infestation during early stage, crop growth restricted resulting in low yield. Plastic mulching is a cost effectice technogy which not only conserves the soil moisture and reduces irrigation requirement but also checks the weeds infestation and insect, pest and disease incidence. KVK Kanker, Bolangir and Nayagarh planned and conducted 31 trials on assessement of plastic mulching in tomato. Results of these trials at showed that the technique enhanced the yield of tomato by 20.93 percent and reduced the weed biomass (g/m^2) by 408.39 per cent. Technology also enhanced the net return and BC ratio by Rs.7,727 and 0.21 compared to farmers' practice.

Table- Performance of plastic mulching in tomato

Details	No. of trials	Fruit Yield (q/ha)	Weed biomass (g/m^2)	Net Return (Rs/ha)	BC Ratio
No mulching (Farmers practice)	31	326.53	106	84813	2.17
Plastic mulching (Recommended practice)		394.87	20.85	92540	2.38

Problem identified: Low yield due to poor rainwater management in Soybean

Technology Assessed: Assessment of Broad Bed Furrow (BBF) sowing system for rainwater management in soybean

KVK Narsinghpur, Neemuch, Shivpuri and Ujjain assessed Broad Bed Furrow (BBF) sowing system by BBF planter in soybean as compared to the normal sowing (sowing in furrows on flat bed). As excess rainfall adversely affects the germination and crop growth. In the Broad

Bed Furrow (BBF) sowing system, soybean is sown on the raised beds. At every raised bed, four rows of soyabean are planted and after every bed one furrow made for rainwater management. 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 conducted at 20 locations showed that this system of sowing enhance the yield by 26.94 per cent. The increase in number of pods per plant was observed by 11.82 per cent. Similarly the net return and BC ratio were Rs. 12,045 and 0.44 higher with the assessed technology.

Table- Performance of Broad Bed Furrow (BBF) sowing system in soybean

Details	No. of trials	Yield (q/ha)	Pod/plant (Nos.)	Net return (Rs/ha)	BC Ratio
Sowing in furrows at flat bed (Farmers Practice)	20	14.96	44.32	33455	2.72
Sowing of soybean on raised bed by Broad Bed Furrow (BBF) planter (Recommended practice)		18.99	49.56	45500	3.16

Agroforestry

Problem identified: Nonjudicious use and low return per unit area from space between eucalyptus and teak based agri silvicultural system

Technology Assessed: Assessment of yield potential and economics of turmeric and ginger between eucalyptus and teak based agri silvicultural system

Trees Like teak and eucalyptus has very less canopy in comparison to other plantations. The interspace between teak and eucalyptus may be utilized by growing shade loving crops like ginger and turmeric. KVK Jabalpur and Nabarangpur planned and counducted 18 trials on assessment of yield potential and economics of turmeric and ginger between eucalyptus and teak based agrisilvicultural system. Results of these trials showed that the agri silvicultural system produced 114.2 q/ha additional yield of spices with the net return of Rs. 189925 over the farmers practice. The retults indicated that the technology is effective and profitable for the farmers as it giving additional benefit from the unutilized interspace between plantations.

Table- Performance of turmeric and ginger between eucalyptus and teak based agri silvicultural system

Details	No. of trials	Yield (q/ha)	No. of rhizomes/plant	Weight of rhizomes/plant (gram)	Net Return (Rs/ha)	BC Ratio
Teak and eucalyptus plantation (Farmers practice)	13	-	-	-	-	-

Details	No. of trials	Yield (q/ha)	No. of rhizomes/plant	Weight of rhizomes/plant (gram)	Net Return (Rs/ha)	BC Ratio
Turmeric and ginger cultivation between eucalyptus and teak based agri silvicultural system (Recommended practice)		114.2	9	183.75	189925	3.7

Problem identified: **Low productivity per unit area, keeping tree alleys fallow in silvicultural system**

Technology Assessed: **Assessment of Hybrid Napier and Guinea grass in silvipastoral system**

The interspace between plantations in silviculture system may be utilized by growing perrinial fodder grasses in silvipastoral system. Keeping above problem on priority, KVK Puri and Nabarangpur of the zone planned and counducted 26 trials on assessment of hybrid Napier and Guinea grass in silvipastoral system. Results of these trials showed that the silvipastoral system produced 800 q/ha additional yield of grasses with the net return of Rs. 36000 over the farmers practice. The retults indicated that the technology is effective and profitable for the farmers as it giving additional benefit from the unutilized interspace between plantations.

Table- Performance of hybrid Napier and Guinea grass in silvipastoral system

Details	No. of trials	Yield (q/ha)	No. of tillers /clump	Net Return (Rs/ha)	BC Ratio
Plantation (Farmers practice)	26	-	-	-	-
Hybrid Napier and Guinea grass in silvipastoral system (Recommended practice)		800	3	36000	1.81

Problem identified: **Low productivity of soybean between interspaces of clonal eucalyptus plantation (8x15 m) in heavy soil**

Technology Assessed: **Assessment of yield potential of early paddy with clonal eucalyptus plantation**

Soyabean cultivation is being practiced by the farmers between the interspaces of clonal eucalyptus plantations producing low yields. The interspace between clonal eucalyptus plantations may be utilized by growing short duration paddy for higher return. KVK Jabalpur of the zone planned and counducted five trials on assessment of yield potential of early paddy with clonal eucalyptus plantation. Results of these trials showed that the agrisilvicultural system produced 37 q/ha yield of paddy with the additional net return of Rs.

2,72,050 over the farmers practice. The retults indicate that paddy can be grown between short rotation clonal plantations of eucalyptus without affecting the yield of companion crop.

Table- Performance of early paddy with clonal eucalyptus plantation

Details	No. of trials	Yield (q/ha)	No. of tillers /plant	Net Return (Rs/ha)	BC Ratio
Soybean cultivation between clonal eucalyptus plantation (8x15 m) (Farmers practice)	5	9.25	-	37900	3.3
Early paddy cultivation between clonal eucalyptus plantation (8x15 m) (Recommended practice)		37	8	309950	6.16

Problem identified: No use of interspaces left between guava plantations (5 m x 5 m)

Technology Assessed: Assessment of yield potential and economics of guava based agrihorticultural system

Sufficient space left between guava plantations which remains unutilized. The interspace between these plantations may be utilized by growing vegetables in agrihorticultural system and additional return can be obtained. KVK Jabalpur of the zone planned and counducted five trials on assessment of yield potential and economics of guava based agrihorticultural system. Results of these trials showed that the agrihorticultural system produced 20 per cent higher yield of guava and additional 100 q/ha yield of vegetables with the additional net return of Rs. 60,000 over the farmers practice. The retults indicated that vegetables can be successfully grown between the interspaces of guava for more profitability.

Table- Performance of yield potential and economics of guava based agrihorticultural system

Details	No. of trials	Yield (q/ha)	Net Return (Rs/ha)	BC Ratio
Guava plantation (5x5 m) (Farmers practice)	5	25	10000	1.2
Guava+vegetables (tomoto, brinjal and chilli) (Recommended practice)		Guava - 30 Vegetables - 100	70000	2.1

Crop Diversification

Crop Diverfication by Kharif Onion

Problem identified: **Less benefit from paddy during kharif season**
Technology Assessed: **Assessment of Agri Found Dark Red variety of onion during kharif for increasing profitability**

Paddy is grown in Madhya Pradesh, Chhattisgarh and Odisha states during kharif season. The net return from paddy is comparatively less to that of vegetables like onion. It may be better substitute in the upland/midland areas of the zone where it can successfully cultivated for increasing profitability. KVK Hoshangabad and Sundargarh-II of the zone planned and counducted 18 trials on assessment of Agri Found Dark Red variety of onion during kharif for increasing profitability. Results of these trials showed that kharif onion yield recorded to be 177 q/ha with the additional net return of Rs. 139500 over the farmers practice (paddy). Retults indicated that cultivation of onion is profitable for the farmers as it giving additional benefit in comparison to paddy.

Table- Performance of onion during kharif season

Details	No. of trials	Yield (q/ha)	Bulb weight (gram)	Net Return (Rs/ha)	BC Ratio
Paddy cultivation (Farmers practice)	18	36	-	23000	2.04
Onion var. Agri Found Dark Red (Recommended practice)		177	80	162500	2.57

Crop Diverfication by Sweet Corn

Problem identified: **Less benefit from hybrid cultivation during kharif season**
Technology Assessed: **Assessment of improved hybrid sweet corn**

Maize is grown in considerable areas in Madhya Pradesh, Chhattisgarh and Odisha states during kharif season. The net return from hybrid maize is comparatively less to that of sweet corn hybrids. It may be better substitute in the maize growing areas of the zone where it can be successfully cultivated for increasing profitability. Keeping the above problem on priority, KVK Dewas (M.P.) and Nayagarh (Odisha) counducted 19 trials on assessment of improved hybrid sweet corn variety Madhuri during kharif for increasing profitability. Results of these trials showed that sweet corn produced 30.93 per cent higher yield and 75 per cent more cobs/plant over farmers practice. Similarly net return and BC ratio was Rs. 27648 and 0.85 units higher over the farmers practice (hybrid maize). The retults indicate that cultivation of sweet corn is profitable to the farmers as it giving additional benefit in comparison to hybrid maize.

Table- Performance of sweet corn hybrid during kharif season

Details	No. of trials	Yield (q/ha)	Cobs/plant	Net Return (Rs/ha)	BC Ratio
Hybrid maize cultivation (Farmers practice)	19	63.7	1.2	44906	2.38
Hybrid sweet corn cultivation (Recommended practice)		83.4	2.1	72554	3.23

Crop Diverfication by China aster

Problem identified: Less benefit from common flower crops like marigold
Technology Assessed: Assessment of China aster cultivation for increasing profitability

Flower cultivation gives higher return in comparison traditional crops being cultivated by the farmers in irrigated conditions, however, monocropping of common flower crops like marigold, the net return decreases due to extra availability of these flowers. China aster is a short duration crop which may be a better substitute in the common flower growing areas and it can be successfully cultivated for increasing profitability. KVK Indore (M.P.) of the zone planned and counducted five trials on assessment of China aster cultivation for increasing profitability. Results of these trials showed that China aster produced 3.3 per cent higher flower yield over farmers practice. Net return and BC ratio was Rs. 78460 and 0.33 units higher over the farmers practice (marigold). Retults indicated that cultivation of China aster is profitable to the farmers as it is short duration crop and giving additional benefit in comparison to marigold.

Table- Performance of China aster cultivation

Details	No. of trials	Crop duration (days)	Flower Yield (q/ha)	Net Return (Rs/ha)	BC Ratio
Marigold cultivation (Farmers practice)	5	180	106	46800	2.01
China Aster cultivation (Recommended practice)		130	109.5	125260	2.34

Small Scale Income Generating Enterprises

Problem identified: **Less income due to high mortality of seedlings raising in open field**
Technology Assessed: **Assessment of low cost polytunnel technique for nursery raising**

Four KVK's from Orissa *viz*. Deogarh, Dhenkanal, Jajpur, Nayagarh and Durg from Chhattisgarh conducted 44 trials to assess the low cost polytunnel technique for nursery raising. The size of poly tunnel was 10 feet long, 3 feet wide and 2 feet above the surface supported by bamboo frames covered by 100 micron polythene sheet for increasing germination with reduced mortality. Results showed 132.59 per cent higher seedlings over farmers practice with 127.65 per cent higher germination and 131.58 per cent increased survibility. Similarly the net return and BC ratio were higher by Rs. 1023 and 0.91. The trails revealed that the performance of ow cost polytunnel technique for nursery raising was more profitable than the farmers practice.

Table- Performance polytunnel technique for nursery raising

Details	No. of trials	No. of seedlings / bed	Germination (%)	Survival (%)	Net return (Rs/bed)	BC Ratio
Traditional nursery in open field (Farmers Practice)	44	675	35.8	38	165	1.19
Poly tunnel - 10 feet long, 3 feet wide and 2 feet above the surface supported by bamboo frames covered by 100 micron polythene sheet (Recommended practice)		1570	81.5	88	1188	2.10

Problem identified: **Non adoptability of sericulture due to hot climatic situation**
Technology Assessed: **Assessment of mulberry silk worm cultivation**

Due to hot climatic situations in Western Odisha, mulberry silk worm cultivation is not very much popular, however, with good management practices it can be done successfully in the region especially in Deogarh district. KVK Deogarh conducted 13 trials to assess the performance of mulberry silk worm cultivation. Results showed that 75 per cent higher cocoons obtained over farmers practice. Similarly the net return and BC ratio was Rs. 5000 and 0.41 units higher over farmers practice. The resuts also revealed that the performance of mulberry silk worm with proper management practices was more profitable than the traditional mulberry cultivation.

Table- Performance of mulberry silkworm cultivation

Details	No. of trials	No. of cocoons/ha	Net return (Rs/ha)	BC Ratio
Traditional mulberry cultivation (Farmers Practice)	13	6400	4300	1.72

Details	No. of trials	No. of cocoons/ha	Net return (Rs/ha)	BC Ratio
Mulberry cultivation with proper management practices (Recommended practice)		11200	9300	2.13

Problem identified: **Low yield due to non availability of alternative high yielding species**

Technology Assessed: **Assessment of yield potential of Oyster mushroom Sp. *Pleurotus eryngii***

Non availability of suitable and improved oyster mushroom species influences greatly its production. By introducing high yielding species the oyster mushroom can be enhanced. KVK Jharsuguda from Orissa conducted 13 trials to assess the performance of oyster mushroom sp. *Pleurotus eryngii*. Results revealed that 13.51 per cent higher mushroom obtained over farmers practice with lesser grain loss. Similarly the net return per bed and BC ratio was Rs. 25 and 0.24 units higher over farmers practice. The trails revealed that the performance of oyster mushroom (*Pleurotus eryngii)* was more profitable than the local mushroom species.

Table- Performance of Oyster mushroom Sp. *Pleurotus eryngii*

Details	No. of trials	Yield (kg/bed)	Grain Loss (%)	Net return (Rs/bed)	BC Ratio
Local mushroom species (Farmers Practice)	13	1.85	25.84	150	1.22
Oyster mushroom (*Pleurotus eryngii)* (Recommended practice)		2.10	11.61	175	1.46

Problem identified: **Low biological efficiency of paddy straw mushroom (10%) (Faulty Package of practices in casing time and harvesting)**

Technology refined: **Refinement of Production of milky mushroom**

KVK Bhadrak (Odisha) undertook 13 trials for performance of milky mushroom- *Calocybe indica*. The results showed an increase 75 % in the production over the farmer's practice. Net return showed an increase of Rs 87.5% over farmer practice. The trials revealed that the performance of milky mushroom was more profitable than farmer practice.

Table- Performance of Milky mushroom- *Calocybe indica*

Details	No. of trials	Yield (kg/bag)	Cost of Input (Rs)
Faulty package of practice (Farmers Practices)	13	20	40
Milky mushroom- *Calocybe indica* (Recommended practice)		35	50

Problem identified: **Poor utilization of paddy straw**
Technology Refined: **Refinement of low cost paddy straw mushroom**

KVK Puri (Odisha) conducted 13 trials with disinfection of straw with Bavistin (8gms) + Formaline (100ml)/100lits/water for low cost paddy straw mushroom. Results showed an increase 46.67 % in the production over the farmer's practice. Net return showed an increase of Rs 45.83% over farmer practice.

Table- Performance of low cost paddy straw mushroom

Details	No. of trials	Production (g/bed)	Net return (Rs)
15 kg of straw (Farmers Practice)	13	600	48
7.5 kg of paddy straw (Recommended practice)		880	70

Problem identified: **Low income of farm family due to unawareness of other sources of income generation**
Technology Assessed: **Assessment of mushroom production technology as an alternative source of income**

Twenty KVK's from zone *viz*. Morena (MP), Bijapur, Gariyaband, Korba, Mahasamund (CG), Angul, Balasore, Bhadrak, Bolangir, Boudh, Deogarh, Dhenkanal, Gajapati, Ganjam-I, Jajpur, Jagatsinghpur, Koraput, Mayurbhanj, Nuapada and Sundergarh-I (Odisha) conducted 245 trials to assess the performance of oyster mushroom. Results showed an increase of 44.4% per bag with 51.9% net return.

Table- Performance of Oyster mushroom

Details	No. of trials	Yield (kg/bag)	Net return (Rs/bag)
Local mushroom (Farmers Practice)	245	1.8	77
Oyster mushroom (Recommended practice)		2.6	117

Drudgery Reduction

Problem identified: **Excess use of man power in traditional method of grading and taking more time**
Technology Assessed: **Assessment of Paddle Operated Seed Cleaner**

A total of 10 trials were conducted by KVK Badwani (MP) during Kharif and Rabi season for the assessment of Paddle Operated Seed Cleaner for drudgery reduction of farm women. Results revealed that use of Paddle Operated Seed Cleaner showed an increase of 266.45% output with reduction in drudgery.

Table- Performance of Paddle Operated Seed Cleaner

Details	No. of trials	Output (Kg/hr)	Increase in output (%)
Mannual cleaning (Farmers Practice)	10	21.46	0
Paddle Operated Seed Cleaner (Recommended practice)		78.64	266.45

Problem identified: **Manual decortication needs more energy & low efficiency.**

Technology Assessed: **Assessment of performance of water chestnut decorticator.**

KVK Damoh and Shahdol (MP) assessed the technology and found that the output increased up to 1138% as compared to traditional method and the operational cost was also reduced by 1125%.

Table: Performance of water chestnut decorticator

Details	No. of Trials	Output (kg/hr)	Operational cost of decortication (Rs/ kg)	Increase in output (%)
Sarota (Farmers Practice)	10	4.2	4.41	0
Water chestnut decorticator (Recommended practice)		52.0	0.36	1138.0

Problem identified: **High infestation of weeds in Rice cultivation.**

Technology Assessed: **Assessment of Wheel weeder for weed control practices in system of rice intensification (SRI).**

KVK Chhindwara (MP) assessed the technology and found that the output increased up to 24.56% as compared to traditional method and weeding cost has reduced up to Rs. 1600/ha.

Table: Performance of Wheel weeder

Details	No. of Trials	Output (Sqm/hr)	Increase in output (%)
Khurpi (Farmers Practice)	05	28.5	0
Wheel weeder (Recommended practice)		35.5	24.56

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

Technology Assessed: **Assessment of Wheel Hoe for drudgery reduction and efficiency enhancement of farm women.**

KVK Chhattarpur, Dewas, Gwalior, Shahdol, Rajgarh (MP) and Balasore (Odisha) assessed the technology and found that the output increased up to 128.6% as compared to traditional method and reduced drudgery up to 69.92%.

Table: Performance of Wheel Hoe

Details	No. of Trials	Output (Sqm/hr)	Reduction in drudgery (Beats/min)
Khurpi (Farmers Practice)	43	43.0	20.9
Wheel Hoe (Recommended practice)		98.3	12.3

Problem identified: **Low efficiency and high drudgery of farm women during cleaning and grading of grains.**

Technology Assessed: **Assessment of Hand operated Double Screen Grain cleaner for reduction of Drudgery and enhancement of efficiency.**

KVK Chhattarpur, Dindori, Gwalior, Hosangabad, Shajapur (MP) and Kendrapara (Odisha) assessed the technology and found that the output increased up to 426.26% as compared to traditional method and reduced drudgery up to 19.33%.

Table: Performance of Hanging sieve

Details	No. of Trials	Output (kg/hr)	Reduction in drudgery (Beats/min)
Chhanna (Farmers Practice)	41	20.27	71.78
Hanging sieve (Recommended practice)		106.67	60.15

Problem identified: **Low efficiency and high drudgery in harvesting of okra.**

Technology Assessed: **Assessment of okra plucker in harvesting okra.**

KVK Ganjam-I and Mayurbhanj-II (Odisha) conducted 10 trials on assessment of okra plucker for farm women to address the problem of plucking by hand. Results showed an increase of 42.86% in plucking capacity with reduction of drudgery. The farm women also recorded a reduced heart rate while operating with the bhindi plucker.

Table- Performance of okra plucker for farm women

Details	No. of trials	Output (kg/ hr)	Heart rate (beats / min.)
Manual Plucking (Farmers Practice)	20	7	110
Okra plucker (Recommended practice)		10	108

Problem identified: **Low efficiency and high drudgery in farm women during seed grading.**
Technology Assessed: **Assessment of spiral seed grader for drudgery reduction.**
KVK Ratlam and Sagar (MP) assessed the technology and found that the output increased up to 492% as compared to traditional method and reduced drudgery up to 25.53%.

Table: Performance of Spiral seed grader

Details	No. of Trials	Output (kg/hr)	Reduction in drudgery (Beats/min)
Chhanna (Farmers Practice)	10	32.2	110.6
Spiral seed grader (Recommended practice)		190.7	88.1

Problem identified: **Time taking and high labour cost.**
Technology Assessed: **Assessment of Groundnut Stripper.**

KVK Badwani (MP) and Khurdha (Odisha) assessed the technology and found that the output increased up to 342.9% as compared to traditional method and reduced drudgery up to 82.54%.

Table: Performance of Groundnut Stripper

Details	No. of Trials	Output (kg/hr)	Reduction in drudgery (Beats/min)
Manual stripping (Farmers Practice)	21	45.2	11.5
Groundnut Stripper (Recommended practice)		200	6.3

Problem identified: **Low efficiency & high Drudgery of farm women during weeding.**
Technology Assessed: **Assessment of Grubber weeder for interculture in vegetables.**

KVK Shajapur (MP) conducted trails on assessment of Grubber weeder for farm women to address the problem of weeding by Local hand hoe. Results showed an increase of 163.64% in weeding capacity with reduction of drudgery. The farm women also recorded a reduced heart rate of 61.53% with the Grubber weeder.

Table- Performance of Grubber weeder for farm women

Details	No. of trials	Output (Sqm/ hr)	Heart rate (beats / min.)
Local hand hoe (Farmers Practice)	05	55	21
Grubber weeder (Recommended practice)		145	13

Problem identified: **High drudgery involved in manual sugarcane bud chipping.**
Technology Assessed: **Assessment of sugarcane bud chipper for drudgery reduction.**

KVK Angul, Bargarh, Dhenkanal and Jajpur (Odisha) assessed the chipping of sugarcane with sugarcane bud chipper and found that the working efficiency increased upto 83.2% and the drudgery was reduced by 29.35 %.

Table- Performance of sugarcane bud chipper for farm women

Details	No. of trials	Output (bud/ hr)	Heart rate (beats / min.)
Manual chipping (Farmers Practice)	52	152.3	5.64
Sugarcane bud chipper (Recommended practice)		279	4.36

Problem identified: **Low efficiency and high drudgery of farm women during sugarcane stripping.**
Technology Assessed: **Assessment of sugarcane stripper for drudgery reduction of farm women in sugarcane harvesting.**

KVK Ganjam-II and Bhadrak (Odisha) assessed the Sugarcane Stripper and found that the stripping efficiency increased upto 21.62% drudgery reduced to a considerable extent and saved up to 50% labour requirement.

Table- Performance of sugarcane Stripper for farm women

Details	No. of trials	Output (kg hr)	Heart rate (beats / min.)
Local sickle (Farmers Practice)	26	37	126
Sugarcane Stripper (Recommended practice)		45	115

Problem identified: **Less output and more drudgery due to manual winnowing by traditional winnowing basket.**
Technology Assessed: **Assessment of manual winnowing fan for drudgery reduction of farmwomen.**

KVK Jharsuguda, Bargarh and Jagatsinghpur (Odisha) assessed the manual winnowing fan and found that the winnowing efficiency increased upto 104.9% drudgery reduced to a considerable extent.

Table- Performance of manual winnowing fan for farm women

Details	No. of trials	Output (kg/ hr)	Heart rate (beats / min.)
Traditional winnowing (Farmers Practice)	39	20.6	128

Details	No. of trials	Output (kg/ hr)	Heart rate (beats / min.)
manual winnowing fan (Recommended practice)		42.2	116

Problem identified: Low efficiency and drudgery involved in manual threshing of sun flower.

Technology Assessed: Assessment of Sunflower thresher for drudgery reduction of farmwomen.

KVK Bolangir, Gajapati, Nayagarh and Sundargarh-II (Odisha) assessed Sunflower thresher and result showed an increase in threshing efficiency of 530% with 23.34% reduction of drudgery.

Table- Performance of Sunflower thresher for farm women

Details	No. of trials	Output (kg/ hr)	Energy exp. (kj / min.)
Manual threshing (Farmers Practice)	36	2	11.2
Sunflower thresher (Recommended practice)		12.6	9.08

Problem identified: High drudgery of Farmwomen in parboiling of paddy.

Technology Assessed: Assessment of Paddy Par boiling Unit for drudgery reduction of Farm women.

KVK Khordha, Mayurbhanj-II and Sundargarh-II (Odisha) assessed Paddy Par boiling Unit and results showed an increase in output of 114.3% with 20.58 % reduction in drudgery.

Table- Performance of Paddy Par boiling Unit for farm women

Details	No. of trials	Output (kg/ hr)	Energy exp. (kj / min.)
Manual boiling (Farmers Practice)	41	35	8.2
Paddy Par boiling Unit (Recommended practice)		75	6.8

Problem identified: High drudgery involved in decorticating mahua seed manually.

Technology Assessed: Assessment of manual mahua seed decorticator for farm women.

KVK Deogarh and Mayurbhanj (Odisha) conducted trials on assessment of mahua seed decorticator for farm women. Results showed an increase of 500% efficiency with reduced heart rate of 12.5 %.

Table- Performance of mahua seed decorticator

Details	No. of trials	Output (kg/ hr)	Heart rate (Beats / min.)
Hand beating (Farmers Practice)	26	1.5	126
Mahua seed decorticator (Recommended practice)		9.0	112

Problem identified: **Low efficiency and high drudgery of farm women in carrying agricultural harvested produce.**

Technology Assessed: **Assessment of manually drawn wheel mounted multipurpose trolley.**

KVK Ujjain (MP) assessed manually drawn wheel mounted multipurpose trolley which is easy to handle and carry more weight and volume of crop by exerting less energy in less time. The result showed the enhancement in efficiency and saving both respectively by 817% with 412%.

Table- Performance of manually drawn wheel mounted multipurpose trolley

Details	No. of trials	Output (kg/ hr)	Saving in Rs.
No use of wheel mounted multipurpose trolley (Farmers Practice)	5	18.8	270
Use of wheel mounted multipurpose trolley (Recommended practice)		172.4	1385

Problem identified: **Traditional practice for making ridge using Spade is time taking and tedious job.**

Technology Assessed: **Assessment of Hand ridger in vegetables crops (potato) to reduce drudgery of farm women.**

KVK Dindori, Rajgarh (MP) assessed Hand ridger for making ridges, turning the soil for bund construction. The result showed 150% increase in efficiency with reduced heart rate of 22.9%.

Table- Performance of Hand ridger

Details	No. of trials	Output (sqm/ hr)
Mannual ridge making (Farmers Practice)	12	40
Hand ridger (Recommended practice)		100

Problem identified: **High drudgery of farm women during sowing of Maize**

Technology Assessed: **Assessment of Women operated CIAE Seed Drill for sowing of Maize.**

KVK Mandla (MP) and Dantewada (CG) assessed Women operated CIAE Seed Drill for sowing of Maize. The result showed 91.67% increase in efficiency with reduced heart rate of 4.6%.

Table- Performance of Women operated CIAE Seed Drill for sowing of Maize

Details	No. of trials	Output (sqm/ hr)
Traditional sowing (Farmers Practice)	9	72
Women operated CIAE Seed Drill for sowing of Maize (Recommended practice)		138

Problem identified: **High physiological stress of farm women during fertilizer broadcasting.**

Technology Assessed: **Assessment of use of fertilizer broadcaster for drudgery reduction.**

KVK Rajgarh (MP) and Boudh (Odisha) conducted trials on assessment of fertilizer broadcaster for farm women. Results showed an increase of 58.3% efficiency with reduced heart rate of 21.43%.

Table- Performance of fertilizer broadcaster

Details	No. of trials	Output (sqm/ hr)	Heart rate (Beats. / min.)
Manual broadcasting (Farmers Practice)	18	6000	10.36
Fertilizer broadcaster (Recommended practice)		9500	12.58

Problem identified: **Manual planting of garlic involves high drudgery time and energy of farm women.**

Technology Assessed: **Assessment of garlic planter for efficiency enhancement of farm women involved in garlic sowing.**

KVK Hosangabad (MP) conducted trails on assessment of garlic planter for farm women. Results showed an increase of 3633.6% efficiency with reduced heart rate of 9.76%. They earned Rs 6675/- as incremental income.

Table- Performance of garlic planter

Details	No. of trials	Output (sqm/ hr)	Heart rate (beats. / min.)	Incremental income (Rs)
Mannual sowing (Farmers Practice)	18	29.76	82	0
Sowing by Garlic planter (Recommended practice)		1111.11	74	6675

Problem identified: **High physiological stress of farm women during harvesting of fruits.**
Technology Assessed: **Assessment of Fruit harvester.**

KVK Rajgarh (MP) conducted trails on assessment of Fruit harvester for farm women. Results showed an increase of 100% efficiency with reduced cost of input of 300 %.

Table- Performance of Fruit harvester

Details	No. of trials	Output (kg/ hr)	Cost of Input (Rs)
Local sickle (Farmers Practice)	05	21	400
Fruit harvester (Recommended practice)		42	100

Problem identified: **High infestation weeds in vegetable cultivation**
Technology Assessed: **Assessment of Peg type dry land weeder for weeds control in chilli crop**

KVK Chhindwara (MP) conducted trial on peg type dry land weeder for weed control in chilli crop and found upto 9.68% increase in efficiency. Weeding and intercultural cost has reduced up to Rs. 7000/ha.

Table- Performance of Peg type dry land weeder for weeds control in chilli crop

Details	No. of trials	Output (sqm/hr)	Net return (Rs)	BC ratio
Manual weeding (Farmers Practice)	05	150	230000	3.88
Peg type dry land weeder (Recommended practice)		170	255000	4.0

Problem identified: **Intercultural operation in transplantation in rice**
Technology Assessed: **Assessment of Cono weeder for intercultural operation in transplanted rice**

KVK Umaria (MP) assessed the cono weeder during paddy weeding. Result of this OFT showed that the use of cono weeder increased efficiency by 29.83% as compared to traditional practice. The net return was also increased by 33.25%.

Table: Performance of Cono weeder

Details	No. of trials	Output (sqm/hr)	Net return (Rs)	BC ratio
Manual weeding (Farmers Practice)	08	47.6	41533	2.72
Weeing by Cono weeder (Recommended practice)		61.8	55343	2.89

Storage

Problem identified: **Low income due to store grain pest (rice weevil) in rice**

Technology Assessed: **Assessment of TNAU insect trap in controlling store grain pest in rice**

Storage lossess of grains occurs due to attack of store grain pests because of inappropriate storage. KVK Jharsuguda of the zone conducted trials on proper storage of grains of rice to avoid looses due to attack of rice weevil pest during storage. TNAU isect trap controlled effectively the store grain pests of rice and 13.51 per cent yield increase was observed over farmers practice. Net return and BC ratio was also higher with the assessed technology. One quintal grain needs 12 insect traps as standard package.

Table- Performance of TNAU insect Trap for controlling store grain pest in rice

Details	No. of trials	Reduction in seed infestation 25% (kg/bag)	Net Return (Rs/bag)	BC ratio
Traditional storage practices (Farmers Practice)	13	75	150	2.40
TNAU isect trap (Recommended practice)		100	175	2.80

Problem identified: **Post harvest loss due to inadequate access to refrigeration facility**

Technology Assessed: **Assessment of zero energy cool chamber**

KVK Dhenkanal (Odisha) conducted trial on Zero Energy Cool Chamber with 165cm length, 115cm breadth, and 67.5 cm height with a cavity of 7.5cm. Zero energy cool chamber is a low cost alternative to store horticulture produce in the dry land villages, Suitable for places without electricity, regular watering in the sand should be maintained as per the climatic change. Time of storage of vegetables increased by 150% with saving in Rs. 1600/-.

Table- Performance of Zero Energy Cool Chamber

Details	No. of trials	Time of storage (days)	Saving (Rs.)
Open condition (Farmers Practice)	02	2	-
Zero Energy Cool Chamber (Recommended practice)		5	1600/-

Problem identified: **Heavy storage loss due to pulse beetle infestation**

Technology Assessed: **Assessment of mustard oil for controlling pulse beetle in green gram**

KVK Bargarh and Boudh (Odisha) conducted trial on mustard oil for controlling pulse beetle in green gram. Treated green gram with mustard oil @ 5ml/kg before storing. Time of storage of pulses increased by 11.9% with saving in Rs. 5200/-.

Table- Performance of mustard oil for controlling pulse beetle in green gram

Details	No. of trials	Grain damaged after six month (%)	Net return (Rs.)
Traditional system (Farmers Practice)	26	3.7	13500
Mustard oil for pulse beetle (Recommended practice)		15.6	18700

Problem identified: **Loss of viability of moong seeds during storage leads to low germination**

Technology Assessed: **Assessment of poly lines gunny bags for storage moong seeds**

KVK Puri (Odisha) conducted trial on poly lines gunny bags for storage moong seeds. Pest attack is reduced to 15%. By using 200 micron poly bag moong seeds can be stored for six months with saving in Rs. 250/-.

Table- Performance of poly lines gunny bags for storage moong seeds

Details	No. of trials	Grain damaged after six month (%)	Saving in Rs.
No use (Farmers Practice)	13	-	-
Poly lines gunny bags for storage moong seeds (Recommended practice)		15	250

Value Addition

Farm women are unaware about value addition to crops, forest produce and fruits for income and empowerment in the nutritional status of their families. Fourteen KVKs of the zone undertook trial for the assessment of the value addition aspect in the various areas which resulted in enhanced quality, rich nutritional status and higher net return of the value added products.

Problem identified: **Lack of knowledge and skill on value addition of groundnut**

Technology Assessed: **Assessment on preparation of peanut butter**

KVK Dhenkanal and Jajpur (Odisha) conducted trial on value addition of groundnut. Peanut butter was the value added product prepared from groundnut. Results indicated that after value addition Rs. 2290.00 per ten kg net return was gained over the farmer's practice. The increase in net income was noted more than 7.5 times than the farmer's practice. Peanut butter has good nutritive value and can be stored for 5 months.

Table- Performance of peanut butter for value addition of groundnut

Details	No. of trials	Incremental income (Rs)	Net return (Rs)
Lack of knowledge (Farmers Practice)	26	500	300

Details	No. of trials	Incremental income (Rs)	Net return (Rs)
Peanut butter (Recommended practice)		3640	2590

Problem identified: Wastage of food in absence of value addition

Technology Assessed: Assessment of income of farm women involved in value addition and processing of local food.

KVK Jabalpur, Sagar, Shahdol, Tikamgarh (MP), Korba (CG), Bolangir, Boudh, Ganjam-II, Mayurbhanj-II and Puri (Odisha) conducted trial on value addition of fruits (Karonda, Mahua) and vegetables (Tomato). Results indicated that after value addition Rs. 900.00 was gained as net profit. The women involved in value addition were satisfied with the value addition technique.

Table- Performance of value addition of fruits and vegetables

Details	No. of trials	Output (kg)	Cost of input (Rs)	Incremental income (Rs)
No value addition (Farmers Practice)	142	-	-	-
Value addition of fruits and vegetables (Recommended practice)		170	3200	4100

Problem identified: Low income of farm women through rose flowers

Technology Assessed: Assessment of income of farm women through value addition, packaging and marketing of rose flowers.

KVK Morena (MP) conducted trial on preparation of value added rose product- Gulkand, packaging and marketing. Results indicated that after value addition Rs. 13745 was gained as net profit. Value addition of rose flowers is appropriate for income generation of farm women.

Table- Performance of value added rose product Gulkand

Details	No. of trials	Output (kg)	Cost of input (Rs)	Incremental income (Rs)
No value addition (Farmers Practice)	05	-	-	-
Value added rose product Gulkand (Recommended practice)		200	13280	26925

Problem identified: **Quality inferiority of mahul flowers due to improper & insufficient drying**

Technology Assessed: Assessment of solar dehydrator for drying of mahua flowers.

KVK Nayagarh (Odisha) assessed solar dehydrator for drying of mahua flowers. Low cost solar drier using bamboo structure and black U-V sterilized polythene sheets of 200 micron size and found that the drying of mahua was increased upto 57%.

Table- Performance of solar dehydrator for drying of mahua flowers

Details	No. of trials	Days required for drying	No. of trees/season
Open condition (Farmers Practice)	05	7	181.72
Solar dehydrator for drying of mahua flowers (Recommended practice)		3	233.60

Income Generation

Problem identified: **Low income due to backyard farming of marigold local species**

Technology Assessed: Assessment of marigold var. Pusa Narangi for income generation

Cultivation of local marigold species results in less retun due to small flower size and less yield. Keeping above problem on priority, KVK Betul conducted trials on improved marigold variety Pusa Narangi at farmer's fields. A total of five trials were conducted on improved marigold variety Pusa Narangi. Results indicated that increase in flower yield was 41.46 per cent higher with improved variety over farmers practice. The number of flowers per plant was also higher (125 %) with the assessed variety. Similarly the net return and BC ratio was Rs. 52000 and 0.6 units higher with the improved variety. The variety is suitable with reference to flower yield and net return per unit area.

Table- Performance of improved nursery in plastic trays

Details	No. of trials	Yield (Q/ha)	No. of flowers/plant	Net Return (Rs./ha)	BC ratio
Local marigold species (Farmers Practice)	13	158	16	9400	1.75
Marigold var. Pusa Narangi (Recommended practice)		223.5	36	61400	2.35

Problem identified: **Low quality seedling due to improper nursery management**

Technology Assessed: Assessment of low cost poly tunnel for improved Nursery management during off-season

KVK Badwani (MP), Mahasamund (CG) and Sundergarh-I (Odisha) conducted trial on improved nursery management. A total of twenty four trials were conducted on improved nursery raising technique. Results indicated that germination was increased 53.23 % higher

with improved nursery raising technique and got increased incremental income as 225 percent.

Table- Performance of improved Nursery management

Details	No. of trials	Seedling/ bed	Germination %	Incremental income (Rs)
Flat bed nursery (Farmers Practice)	24	480	62	240
Low cost poly tunnel (Recommended practice)		1560	95	780

Problem identified: Low income of farm women due to use of local marigold variety

Technology Assessed: Assessment of improved variety of marigold var. pusa narangi for income generation

KVK Betul, Sagar and Shajapur (MP) conducted trial on improved variety of marigold var. pusa narangi for income generation. Results indicated that germination was increased 77.5 % higher with improved nursery raising technique and got increased incremental income as 114.8 percent.

Table- Performance of marigold var. pusa narangi

Details	No. of trials	No. of flowers/ plant	Yield (q/ha)	Incremental income (Rs)
Local variety (Farmers Practice)	15	42	120	1310
Marigold var. pusa narangi (Recommended practice)		58	213	2814

Problem identified: Marketing of raw water chestnut

Technology Assessed: Assessment of income generation in women through sale of lalgulara variety of water chestnut.

KVK Seoni (MP) conducted an OFT on sale of lalgulara variety of water chestnut through cooperative society and Kisan Sale counter. After assessment the output increased up to 78.95% with saving in Rs. 69550.

Table- Performance of Lalgulara variety of water chestnut

Details	No. of trials	Output (q/ha)	Cost of input (Rs)	Net return (Rs)
Old variety (Farmers Practice)	05	38	30000	65000
Lalgulara variety of water chestnut (Recommended practice)		68	45450	134550

Problem identified: **Low income of farm women due to unawareness about high yielding varieties**

Technology Assessed: **Assessment of HYV Sugar 75 of sweet corn (green cobs) for income generation of farm women**

KVK Hosangabad (MP) conducted trial on HYV Sugar 75 of sweet corn for income generation. Results indicated that they got increased incremental income of Rs.79000.00

Table- Performance of HYV Sugar 75 of sweet corn

Details	No. of trials	Production (q/ha)	Cost of input (Rs)	Incremental income (Rs)
Non cultivation of sweet corn (Farmers Practice)	05	-	-	-
HYV Sugar 75 of sweet corn (Recommended practice)		612	460	79000

Problem identified: **Low income of farm women due to production of low yielding varieties of vegetables**

Technology Assessed: **Assessment of hybrid vegetables production for income generation of farm women**

KVK Tikamgarh (MP) conducted trial on hybrid vegetables production for income generation of farm women. Results indicated that they got increased yield as 129.78% with incremental income of Rs.143574/. Hybrid vegetable cultivation help in increasing income of farm women.

Table- Performance of hybrid vegetables production

Details	No. of trials	Yield (q/ha)	Cost of input (Rs)	Incremental income (Rs)
Old variety (Farmers Practice)	05	125.6	33019	188400
Hybrid vegetables production (Recommended practice)		288.6	53143	432900

Problem identified: **Low income of farm women due to traditional method of composting**

Technology Assessed: **Assessment of utilization of Bio-slurry of Bio gas plant in increasing income of farm families by vermi-composting**

KVK Hosangabad and Tikamgarh (MP) conducted trial on vermi-composting for income generation of farm women. Results indicated increased yield as 58.2% with incremental income of Rs.116/.

Table- Performance of vermi-composting

Details	No. of trials	Yield (kg)	Cost of input (Rs)	Incremental income (Rs)
Simple waste (Farmers Practice)	10	63.22	50	100
Vermi-composting (Recommended practice)		100	150	316

Problem identified: **Poor milk yield due to vitamin and mineral deficiency**

Technology Assessed: **Assessment of vitamin and mineral mixture in milk productivity of Milch Cow**

KVK Bargarh and Deogarh (Odisha) conducted trial on vitamin and mineral mixture in milk production of cow. Results indicated increased milk production as 23.6% with incremental income of Rs.3820/.

Table- Performance of vitamin and mineral mixture in milk production of cow

Details	No. of trials	Milk production (lt/ cow/ 4month)	Cost of input (Rs)	Incremental income (Rs)
No use (Farmers Practice)	26	720	11100	18720
Vitamin and mineral mixture in milk production of cow (Recommended practice)		890	11700	23140

Problem identified: **Low family income and seasonal unemployment of farm women**

Technology Assessed: **Assessment of back yard rearing of improved poultry breed**

KVK Balasore, Jajpur, Koraput, Mayurbhanj and Sundargarh-I (Odisha) conducted trial on rearing of improved poultry breed in backyard. Increase in weight was recorded as 40.6% with incremental income of Rs.735/.

Table- Performance of back yard rearing of improved poultry breed

Details	No. of trials	Increase in wt. (kg/6 month)	Cost of input (Rs)	Incremental income (Rs)
Local breed (Farmers Practice)	65	3.2	120	2475
Improved poultry breed (Recommended practice)		4.5	750	3840

Problem identified: **Poor economic status of farm women due to no use of unused paper**

Technology Assessed: **Assessment of use of unused paper for making of paper bag and envelops for income generation.**

KVK Jabalpur (MP) conducted trial on use of unused paper for making of paper bag and envelops for income generation. Net profit was recorded as Rs. 195/- with saving in Rs.145/. Land less farm women will earn the income by making of Paper bag & envelop

Table- Performance of paper bag and envelops for income generation

Details	No. of trials	No. of bags produced	Cost of input (Rs)	Incremental income (Rs)
No use (Farmers Practice)	05	-	-	-

Details	No. of trials	No. of bags produced	Cost of input (Rs)	Incremental income (Rs)
Paper bag and envelops (Recommended practice)		49	50	245

Nutritional Security

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

Technology Assessed: Assessment of backyard nutritional kitchen garden.

The kitchen gardening is an imperative tool of our daily life. The main aim of kitchen, home, or nutritional 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 Burhanpur (MP) and Bijapur (CG) conducted 09 trials on backyard nutritional gardening and result showed increased yield 237.5% with saving of Rs.1425.

Table: Assessment of performance of backyard nutritional kitchen garden

Details	No. of Trials	Yield Kg/plot	Net Return (Rs)
Unplanned (Farmers Practice)	09	40	600
Plan round the year availability of nutritive vegetables & Fruits in the garden (25 x 10 m) (Recommended practice)		135	2025

Problem identified: Household food insecurity among farm women.

Technology Assessed: Assessment of soybean products for household food security of farm families.

KVK Chhatarpur, Khargone, Morena, Sehore and Tikamgarh (MP) conducted 40 trials on addition of soybean products in diet for household food security and found that10.3% Physical fit with good nutrition.

Table: Assessment of soybean products

Details	No. of Trials	Increase in Wt. (kg)	Cost of input (Rs)
No use of soybean in diet (Farmers Practice)	40	-	-
Soybean products (Recommended practice)		1.8	160

Problem identified: **Malnutrition among children.**

Technology Assessed: **Assessment of protein and iron rich food among children suffering from malnutrition.**

KVK Bilaspur, Durg, Raigarh and Surguja (CG) assessed the diet on 58 children. Average weight gain was recorded as 3.5 kg (31.25%) after nutritious food given by KVK and the percentage increase in Haemoglobin (Hb) was found 15.15% due to daily consumption of nutritious laddoo given by KVK for two month regularly.

Table: Assessment of protein and iron rich food

Details	No. of Trials	Increase in Wt. (kg)	Increase in HB (%)
Normal feed (Farmers Practice)	58	11.2	9.9
Protein and iron rich food (Recommended practice)		14.7	11.4

Problem identified: **Non availability of green fodder and excess cost of commercial feed.**

Technology Assessed: **Assessment of Azolla supportive feed for Milch cow.**

KVK Angul (Odisha) assessed Azolla supportive feed for Milch cow and found that 9.52% increased milk production with Rs. 750/- as incremental income. Use the Azolla cattle feed in 2:1 ratio (commercial feed and Azolla); it increases the quality and quantity of milk.

Table: Assessment of Azolla supportive feed for Milch cow

Details	No. of Trials	Milk production lt/cow/day	Cost of input (Rs)	Incremental income (Rs)
Normal feed (Farmers' practices)	13	10.5	3000	7875
Azolla supportive feed for Milch cow (Recommended practice)		11.5	2700	8625

Farm Machinery

Problem identified: **Low yield due to poor seed bed and time consuming field preparation**

Technology Assessed: **Field preparation by improved implement Rotavator**

Seed bed preparation is first and the most important tillage operation in *kharif* and *rabi* season. Fine seed beds are necessary for better growth in the root zone. Traditionally seed beds are prepared by bullock drawn plough and/or tractor drawn cultivator followed by *bukher* operation. Rotavator implies multiple cuts and thus pulverize the soil to very fine level, and thus prepared seedbeds enhance the plants growth. Rotavator has been assessed by KVK Jajpur and Korea in *kharif* season for rice crop and Neemuch, Ashoknagar, Shajapur for wheat crop and KVK- Mandsaur for chickpea crop in *rabi* season. Results showed 13.8% increase in Yield, 30% increase in field coverage, and 29% more net return due to seed bed preparation by Rotavator.

Table: Performance of improved implement Rotavator

Details	No. of trials (KVK)	Crop	Yield (q/ha)	Field capacity (ha/hr)	Net Return (Rs/ha)	B:C Ratio
Field preparation by cultivator/ plough (Farmers' practices)	13 (Jajpur) 5 (Korea) 5 (Neemuch) 5 (Shajapur) 5 (Ashoknagar) 5 (Mandsaur)	Rice	42.3	0.4	26455	2.00
		Rice	29.4	0.3	12861	1.40
		Wheat	17.33	0.3	33623	2.67
		Wheat	37.02	0.3	34172	1.80
		Wheat	35.3	0.3	36200	3.16
		Mustard	17.72	0.2	40210	3.10
Field preparation by Rotavator (Recommended practice)		Rice	44.9	0.4	31205	2.25
		Rice	32.7	0.4	20345	1.80
		Wheat	20.38	0.45	42528	3.06
		Wheat	41.7	0.4	42422	2.30
		Wheat	42.6	0.4	46450	3.66
		Mustard	20.28	0.26	47590	3.59

Problem identified: Low yield due to use of non-precision sowing implements

Technology Assessed: Sowing of crops with seed cum fertilizer drill

Seed sowing should be at proper depth, proper distance and with the fertilizers. Seed cum fertilizer drill place the seed at proper interval of distance and also place fertilizer just below or nearby the seed for maximum and efficient utilization. It saves seed, fertilizer, and time of operation and provides ease in inter-culture and plant protection operations. Seed cum fertilizer drill assessed by KVK Jajpur and Dantewada for sowing of green gram. Result showed 1.8 times field coverage, 43% more yield and 73% more net return by using seed cum fertilizer drill.

Table: Performance of improved implement Seed cum fertilizer drill

Details	No. of trials (KVK)	Crop	Yield (q/ha)	Field capacity (ha/hr)	Net Return (Rs/ha)	B:C Ratio
Sowing with bullock-drawn sowing implements (Farmers' practices)	13 (Jajpur)	Green gram	6.4	0.25	9500	1.49
	4 (Dantewada)		4.9	0.40	9300	1.90
Sowing with seed cum fertilizer drill (Recommended practice)			7.6	0.55	14000	1.69
			8.2	0.60	18600	2.30

Problem identified: **Extreme conditions of moisture availability leads poor yield of soybean in flat sowing.**

Technology Assessed: **Sowing of soybean on ridges by Raised bed planter**

Soybean crop is sensitive to moisture level and greatly affected by extreme conditions of water logging and moisture stress. Raised bed planter forms two beds with furrow and plants two rows on each bed at proper distance. Furrows are 20-25 cm deep and beds are 45-50 cm wide. Such raised beds manage optimum moisture levels near root zone while furrow facilitate the excess water to drain off safely. KVK Dhar, Shajapur and Mandsaur assessed Raised bed planter for sowing soybean in kharif, 2013 season. Due to moisture management in heavy rainfall and dry spell period by the raised bed and furrow system, soybean yield was increased upto 33%. Use of this planter resulted in Rs.10,000/-ha more net profit.

Table: Performance of improved implement Raised bed Planter Crop- Soybean

Details	No. of trials	Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
Sowing of soybean with seed drill (Farmers' practices)	5 (Dhar)	12.05	19055	2.04
	5 (Shajapur)	12.37	20914	2.2
	5 (Mandsaur)	14.64	26510	2.9
Sowing with Raised bed planter (Recommended practice)		16.06	32592	2.73
		16.20	33000	2.76
		15.07	30880	3.15

Problem identified: **High cost of manual harvesting**

Technology Assessed: **Harvesting through Vertical conveyer Reaper**

To mechanize the harvesting operation, vertical conveyer reaper machine is assessed by KVK Dantewada and KVK Dhamtari. Rice crop was harvested with this machine which resulted in saving of labour (5 hr/ha in place of 30 mandays). It also provided Rs.5,000 to 11,000/- more net return per ha.

Table: Performance of improved implement Zero till drill

Details	No. of trials (KVK)	Crop	Yield (q/ha)	Field capacity (ha/hr)	Net Return (Rs/ha)	B:C Ratio
Harvesting manually by Sickle (Farmers' practices)	4 (Dantewada)	Rice	24.5	0.03	17810	2.4
	4 (Dhamtari)	Rice	39.85	0.034	22798	1.8
Harvesting by vertical conveyer reaper (Recommended practice)			31.0	0.21	23140	2.5
			45.0	0.24	35460	2.4

Problem identified: **High cost of manual transplanting**
Technology Assessed: **Seeding of pre-germinated rice with Drum Seeder**

In the SRI method, high requirement of labour for transplanting is a problem. To overcome this problem, seeding of pre-germinated seed has been assessed by KVK Kanker and Dhenkenal by use of drum seeder. This machine drops pre-germinated rice seed at definite interval through the holes punched in the drum. This machine is human driven and can be easily operated by women. Results showed 10 times more field coverage with additionally 18% more yields which ultimately gives 39% more net returns.

Table: Performance of improved implement Drum Seeder

Details	No. of trials (KVK)	Crop	Yield (q/ha)	Field capacity (ha/hr)	Net Return (Rs/ha)	B:C Ratio
Transplanting of Rice manually (Farmers' practices)	5(Kanker)	Rice	36.12	0.033	20807	2.09
	13 (Dhenkenal)	Rice	40.5	0.03	27705	2.09
Seeding of pre-germinated seed by Drum seeder (Recommended practice)			48.42	0.36	32762	2.59
			41.3	0.33	33403	2.61

Problem identified: **High cost of manual weeding in Rice**
Technology Assessed: **Weeding in Rice by Power weeder**

Weeding operation is highly labour intensive. To overcome the labour demand for weeding, power weeder has been assessed by KVK- Jajpur and KVK- Mayurbhanj. This machine is self propelled. This machine can easily be operated by women as well. Results showed 10 times more field coverage with additionally 8-9% more yields which ultimately gives 25% more net returns.

Table: Performance of improved implement Drum Seeder

Details	No. of trials (KVK)	Crop	Yield (q/ha)	Field capacity (ha/hr)	Net Return (Rs/ha)	B:C Ratio
Weeding in Rice by cono weeder manually (Farmers' practices)	13 (Jajpur)	Rice	42.8	0.008	25140	1.89
	5 (Mayurbhanj)	Rice	38.3	0.011	15700	1.69
Weeding by Power weeder (Recommended practice)			43.4	0.1	27790	2.05
			44.4	0.12	22230	2.00

Problem identified: **High cost and time consuming manual harvesting**

Technology Assessed: **Harvesting through Reaper cum binder**

To mechanize the harvesting operation, reaper cum binder machine is assessed by KVK-Damoh and Ashoknagar for harvesting wheat and Dhankenal for harvesting rice. This machine binds the harvested loops also for ease in feeding for threshing. Reaper cum binder operation resulted in saving of labour (5 hr/ha in place of 25 mandays) and provided Rs.10,000 /- more net return per ha.

Table: Performance of improved implement Zero till drill

Details	No. of trials (KVK)	Yield (q/ha)	Field capacity (ha/hr)	Net Return (Rs/ha)	B:C Ratio
Harvesting manually by Sickle (Farmers' practices)	15 (5 each by Damoh, Ashoknagar, Dhankenal)	29.45	0.005	24655	2.5
Harvesting by reaper cum binder (Recommended practice)		32.55	0.2	34708	3.2

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 by pass fat and protected protein in buffaloes**

KVK Gwalior, Mandsour and Tikamgharh conducted OFT on Feeding bypass fat and protected protein resulting in increase avg. milk yield by 12.63 % and 16.78 percentage increase in net return.

Table: Performance of bypass fat and protected protein

Details	No. of trials	Avg. Milk Yield (lit/day/animal)	Net Return (Rs.)	B:C Ratio
No feeding of bypass fat and protected protein in the ration (Farmers' practices)	20	6.73	151.9	4.03
Feeding of formaldehyde treated bypass protein and bypass fat @ 100 gm each / animal / day (Recommended practice)	20	7.58	177.4	4.55

Problem diagnosed: **Poor quality nutrient diet results in the lack of essential mineral and vitamin requirement with leads to low production and profitability in milch animals**

Technology assessed: **Assessment of mineral mixture and vitamin supplementation on the milk production of milch animls**

KVK Sidhi, Mandsaur, Sehore, Satna, Umaria and Kanker conducted OFT to asses' mineral mixture and vitamin supplementation on the milk production of cow and buffalow from calving up to six month of lactation and observed 23.87 % increase in milk production per day per animal and 14.81% increase in net returns.

Table: Effect of min mix and vitamin supplement on production of cattle and buffaloes

Details	No of trial	Av. Milk yied (lit/lactation/animal)	Net Return(Rs.)	B:C ratio
Dry+green+cake without mineral and vitamin supplement (Farmers' practices)	20	1998	5400	1.97
Mineral and vitamin supplement @ 50 gram from date of calving to six month of lactation with balanced dry+green+concentrate (Recommended practice)	46	2475	6200	2.22

Problem identified: **Low production and profitability due to improper feeding management**

Technology assessed: **Balanced feeding with mixing dry fodder (straws), chaffed green fodder, chuni and concentrate mixture supplementation with mineral mixture salt vitamins ext.**

KVK Gwalior, Sehore and Jabalpur conducted OFTs on assessment of the balanced feeding by total mixed ration (TMR) mixing dry fodder(straws), chaffed green fodder, chuni and concentrate mixture supplementation with mineral mixture salt vitamins ext on the production and productivity of the cattle. Observation revealed that average increase in milk yield by 30.76% and 49.19 % increase in net return with better feed utilization by the animal due to palatability and less wastage feed residues.

Table: Effect of total mixed ration (TMR feeding) supplemented with mineral mixture and calcium vitamins on and milk production in lactating cows and buffalos

Details	No of trial	Av. Milk yied (kg/lactation /animal)	Net Return(Rs.)	B:C ratio
Improper feeding management – feeding dry fodder,greens,and concentrate separately at different intervals (Farmers' practices)	10	1950	37200	1.84

Details	No of trial	Av. Milk yied (kg/lactation /animal)	Net Return(Rs.)	B:C ratio
Balanced feeding by total mixed ration (TMR) mixing dry fodder(straws), chaffed green fodder, chuni and concentrate mixture supplementation with mineral mixture salt vitamins ext. (Recommended practice)	25	2550	55500	2.32

Problem identified: **Low production and profitability due to improper feeding management during lactation period just after calving especially during early, mid, lactation where lactating animal require high energy diet according to body weight and milk yield**

Technology assessed: **Assessment of challenge feeding according to body weight and milk production to compensate the energy loss can result in high pick yield and potential milk production.**

KVK Guna and Ratlam conducted OFTs on assessment of production potential of cattle by challenge feeding i.e. feeding concentrate mixture according to body weight taken at 15 day interval till body weight is maintained and according to milk production. Observation revealed that average increase in milk yield by 39%, increase in peak yield by 22.22% and 53.97 % increase in net return.

Table: Effect of challenge feeding during early, mid and late lactation according to body weight and milk production at 15 days interval till body weight is maintain in HF Cross bred high yielding cows

Technological Details	No. of trials	Avg. Milk yield (kg/lactation /animal)	Avg. Peak yield in kg/lactation/ animal	Net Return (Rs.)	B:C Ratio
Improper feeding management during mid early and late lactation just after calving not according to body weight and milk production (Farmers' practices)	05	2760	14	27680	1.84
The concentrate mixture is fed according to body weight taken at 15 day interval till body weight is maintained and according to milk production (Recommended practice)	13	3840	18	42620	2.0

Problem identified: **Low milk production and profitability due to high fiber diet, deficiency of essential minerals and enzymes in the ration resulting in incidence of anorexia acidosis and recurrent infection of digestive system and poor growth and health of cattle**

Technology assessed: **Assessment of direct feeding of yeast culture, fibrolytic enzymes, pre and probiotics on the milk production and body condition of the cattle and buffaloes**

KVK Khandwa, Mandsaur, Indore, Ratlam, Jabalpur, Ganjam, Nayagarh, Puri and Sagar conducted OFT on assessment of direct feeding of yeast culture, fibrolytic enzymes, and probiotics and in the ration resulting in increase avg. milk yield by 40.42%, decrease incidence of digestive disorders by 300 % and 51.25% increase in net return with good body condition score.

Table: Performance of direct feeding of yeast culture, fibrolytic enzymes, prebiotics/probiotics and in milk production and body condition of cattle and buffalos

Technology Option	No. of trials	Avg. Milk yield (kg/lactation /animal)	Incidences of digestive disorders (%)	Net Return (Rs.)	B.C. Ratio
No use of Yeast culture/fibrolytic enzymes and prebiotics in the ration (Farmers' practices)	30	1410	80	5580	1.45
Feeding yeast culture/fibrolytic enzymes, prebiotics and probiotics in the recommended doses (Recommended practice)	64	1980	20	8440	1.60

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 Datia, Rajnandgaon and Raisen conducted OFT on assessment green fodder production of barseem/hybrid Napier and perennial grass on milk production observing increase of avg. milk yield by 33.59% and 49.02% increase in net return.

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

Details	No. of trials	Avg. Milk yield (lit/lactation)	Net Returns (Rs./litr.)	B.C. Ratio
Local variety poor quality fodder production and feeding (Farmers' practices)	10	2268	7726	1.49
Barseem/ Hybird Napier with	14	3030	11514	1.74

Details	No. of trials	Avg. Milk yield (lit/lactation)	Net Returns (Rs./litr.)	B.C. Ratio
recommended practices and feeding (Recommended practice)				

Problem diagnosed: **Low production and profitability during drought period (April to July) due to unavailability of greens and low plane ration (Poor protein and energy diet)**

Technology assessed: **Assessment of Urea Mollases Mineral block (UMMB) /Azolla feeding for sustaining milk production during the drought period**

KVK Katni, Umaria, Khandwa and Raisen conducted OFT on Assessment of Urea Mollases Mineral block (UMMB) /Azolla feeding for sustaining milk production during the drought period resulting in increase avg. milk yield by 30.4% and 41.8% increase in net returns.

Table: Performance of Urea Mollases Mineral block (UMMB) /Azolla feeding on milk production during the drought period

Details	No of trails	Average milk yield (Lit/day)	Net returns	B:C ratio
Feeding only dry no greens during the drought period (Farmers' practices)	10	1875	33000	1.82
Feeding dry along with Urea Molosis Mineral block (UMMB) (300 gm) /Azolla(400 gm)/animal/day (Recommended practice)	26	2445	46800	1.93

Problem diagnosed: **Poor quality nutrient diet results in the lack of essential mineral and vitamin requirement with leads to low Milk production and profitability in milch animals**

Technology assessed: **Assessment of direct feeding of calcium and vitamins supplement on the milk production of milch animls**

KVK Gwalior and Raisen conducted OFT to asses direct feeding of oral calcium and vitamin supplementation on the milk production of Cow and Buffalo from calving up to six month of lactation and observed 31.42% increase in milk production per day per animal and 32.38% increase in net returns.

Table: Effect of direct feeding of calcium and vitamins supplement on production of cattle and buffalos

Technological detail	No of trial	Av. Milk yield/lactation /animal (liter)	Net Return (Rs.)	B:C ratio
Dry + green + cake without calcium and vitamin supplement (Farmers' practices)	5	2100	31500	2.06

Technological detail	No of trial	Av. Milk yield/lactation /animal (liter)	Net Return (Rs.)	B:C ratio
100 ml Oral calcium and vitamin supplement from date of calving to three month of lactation. balanced dry + green + concentrate (Recommended practice)	15	2760	41700	2.14

Problem diagnosed: **Low production and profitability due to increased incidence of prolonged postpartum heat and anoestrus due to poor feeding (i.e. deficiency of essential mineral mixture, vitamin and amino acids) in crossbred 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 / herbal drug or PGF2**

KVK Jabalpur and Umaria use herbal heat inducer, while Tikamgarh use PGF2 alpha on reproductive performance in cross bed cattle in which herbal medicine require longer period three to six month where as PGF2 alpha response early by which 60% animal of them become cyclic and got inseminated within 60-90 days after calving with increase in net return by 24.15%.

Table: Performance of herbal heat inducer and PGF2 alpha on management of prolonged postpartum heat and anoestrus problem

Technological details	No. of trials	Expression of estrous after calving (days)	Avg. Net Returns (Rs.)	B.C. ratio
Do not take care after calving on balance feeding of the cross bed cattle and also do not use any drugs (Farmers' practices)	05	120 - 180	54650	2.44
After parturition follow de-worming and supplementation of essential mineral mixture, vitamins, amino acids and recommended herbal medicines in the ration of the cross bed cattle for 03 to 06 months or PGF2 alpha 2ml I/M in non-pregnant anoestrous animals for induction of estrous (Recommended practice)	15	60 - 90	67850	2.65

Animal Disease Management

Problem identified: **Low production and profitability due to high incidence of calves mortality infested with heavy load of worms**

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

KVK Lahar(Bhind), Khandwa, Jabalpur and Sidhi conducted OFT on assessment of piprazine and fenbendazole antihelmentic drug which results in 500 % reduction in calf mortality, increase in dams yield by 28.6% and 42.89 % increase in avg. net return.

Table: Performance of piprazine/albendazol antihelmentic drug on calf mortality and milk production

Technological Details	No. of trials	Calf mortality (%)	Avg. dams sealed per lactation	Avg. Net Returns (Rs.)	B.C. Ratio
Do not follow the de-worming schedule occasionally provide deworming medicine that to local herbal drag and do not maintain hygienic condition (Farmers' practices)	10	60	1518	8587.5	1.49
Follow up de-worming schedule by piprazine broad spectrum antihelmentic drug i.e. de-worming before and after monsoon and follow the hygienic condition and cleanliness of the shed (Recommended practice)	26	10	1953	12271	2.6

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 doramactin/ivermectin drug**

KVK Lahar (Bhind), Guna, Katni, Mandla, Umaria, and Khandwa conducted OFT on assessment of doramactin/ivermectin for the management of ecto and endo parasite in cow and buffaloes. This results in reduction of incidence of endo and ecto parasite. Ecto parasite with increase in milk production by 26.4% and 47.5% in net return.

Table: Performance of doramactin/ivermectin drug for ecto and endo parasite management

Technological Details	No. of trials	Avg. Lactation yield (lit./day)	Avg. Net Returns (Rs.)	B.C. Ratio
Farmers follow drug to control endo & ecto parasite separately and that to occasionally (Farmers' practices)	10	1210	14520	2.2
Control of ecto and endo parasite combined by one composite drug (IVERMECTINE) twice in the year (Recommended practice)	30	1530	21420	2.8

Problem identified: **Low production and poor body condition score due to infestation of endo parasites (nematodes, cestodes and hook worms ext.)**

Technology assessed: **Management of endo parasite by following schedule of broad spectrum anti- helmantic drugs Oxyclozanide**

KVK Sagar conducted OFT on assessment of broad spectrum Oxyclozanide for the control of endo parasite in cow and buffaloes. This results in reduction of incidence of endo parasite with increase in milk production by 14.75% and 16.66% in net return.

Table: Performance of broad spectrum anti-helmantic drugs Oxyclozanide for endo parasite management

Details	No. of trials	Avg. Milk yield (lit./lactation)	Avg. Net Returns (Rs.)	B:C Ratio
Farmers do not follow drug to control endo parasite and generally use local and herbal home made drugs (Farmers' practices)	05	915	27000	5.3
control of endo parasite by following schedule of broad spectrum anti- helmantic drugs Oxyclozanide (Nilzan 100 ml in two dose) (Recommended practice)	05	1050	31500	5.5

Problem identified: **Low production and poor body condition score due to infection of ecto parasites (tick, mites, lice etc.)**

Technology assessed: **Management of ectoparasiticides by drug (flumethrin) and following hygienic condition of animal and shed**

KVK Sagar conducted OFT on assessment (flumethrin) drugs for the control of ecto parasite in cow and buffaloes. This results in reduction of incidence of ecto parasite (ticks) by 500 % with 36.2% in net return.

Table: Performance of ectoparasiticides (flumethrin) for tick's management

Technology Details	No. of trials	Tick incidence (%)	Avg. Net Returns (Rs.)	B.C. Ratio
Farmers do not follow drug to control ecto parasite and generally follow local measures available (Farmers' practices)	05	80	3120	1.7
Control of ecto parasite by following schedule of (flumethrin @ 2ml/lit of water) for animal spray and @ 1ml for spray in shed and surroundings. (Recommended practice)	05	20	4250	2.1

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

Technology assessed: **Assessment of feeding selenium and vitamin E to control sub clinical mastitis**

KVK Sehore, Katni and Tikamgarh assessed the prophylactic majors for mastitis by feeding selenium and vitamin E resulting in 700 % reduction in cases of mastitis and average increase in milk yield by 50.9%and 70% in net return.

Table: Performance of feeding selenium and vitamin E to control mastitis in milch animal

Technological Details	No. of trials	Disease incidence (%)	Milk yield per lactation	Avg. Net Returns (Rs.)	B.C. Ratio
Poor prophylactic majors for mastitis (No practice of cleaning of udder and regular testing of subclinical mastitis and no use of drugs (Farmers' practices)	10	40	1212	9696	1.5
Supplementation of 2 gram vitamin E + selenium per day per animal for 60 days during dry pried prior to calving for control of subclinical mastitis (Recommended practice)	20	5	1830	16483	2.43

Goatry

Problem identified: **Poor body growth and body condition due to infestation of endo parasites (nematodes, cestodes and hook worms) resulting in kid mortality low production and profitability**

Technology assessed: **Regular De-worming with broad spectrum antihelmentic drug**

KVK Balrampur, Bijapur, Korba, Korea, Raigarh, Kanker, Sidhi and Sehore conducted OFT on regular de-worming with broad spectrum antihelmentic drugs and Neem leaves which result in increase in 43.32 % body weight of kids with good body condition score the antihelmentsic drugs kills worms as well as intermediate stages where as neem leaves help in expulsion of adult worms only.

Table: Performance of regular de-worming with antihelmentic drug and Neem leaves

Technological Details	No. of trials	Body wt. (kg) at 3 month age	Body condition	B.C. Ratio
Do not follow up the regular de-worming schedule. Only take local available treatment (Farmers' practices)	10	8.54	Poor	2.20
Follow up the regular de-worming schedule with broad spectrum drugs (Fenbendazole, Albendazole and Piperzine) (Recommended practice)	33	12.24	Good	2.70

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

Technology assessed: **Assessment of performance of improved breeds of goat (Sirohi) for milk + meat production**

KVK Khurda conducted OFT on Assessment of improved bucks(sirohi) for up gradation of non-descript goats which result in increase in body wt. by 1.33 kg as compare to local by 1.14 kg/month.

Table: Performance of up-gradation of local breed by improved breed (sirohi)

Technological Details	No. of trials	Body Wt. kids at kg			Avg. growth rate in kg per month
		At birth	6 M	9 M	
Rearing of local non descript breeds of goat (Farmers' practices)	2	1.8	6.7	12.1	1.14
Improved sirohi bucks for up gradation of non-descript goats (Recommended practice)	2	2.4	8.1	14.4	1.33

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

Technology assessed: **Assessment of Feeding balance concentrate along with lime stone (mineral) vitamins probiotic on body wt. growth and milk production in goat**

KVK Guna and Jajpur conducted OFT on Assessment of feeding balance concentrate along with lime stone (mineral) vitamins probiotic on body wt. growth in goat. This results in increase in boby wt. by 50%, milk yield by 36.53% and net return by 53.28%.

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

Technology Details	No. of trials	Avg. Body wt. kids (kg) 03 month	Milk yield in lit. 90 days	Net returns (Rs.)	B.C. Ratio
Free range grazing and feeding imbalance concentrate and available greens (Farmers' practices)	5	8	255.76	1490	3.23
Feeding recommended balance concentrate mixture and greens along with free range grazing (Recommended practice)	17	12	349.2	2284	3.73

Problem identified: **Low production and profitability due to high incidence Fascioliasis in goat**

Technology assessed: **Regular antihelmentic drug management with supportive therapy and hygiene with control of snails in an around water reservoirs**

KVK Satna conducted OFT on assessment helmentic drug management in controlling Fascioliasis in goat which resulting 550 % reduction in Fascioliasis and 40% net return with fair body condition.

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

Technology Details	No. of trials	Incidence of Fascioliasis (%)	Net return (Rs.)	B.C. Ratio
Do not follow up the regular de-worming schedule. Only take local availabl treatment (Farmers' practices)	05	65	545.5	3.19
Regular antihelmentic drug (DISTODIN/FLUKIN/TRODAC) management with supportive therapy and hygiene with control of snails in an around water reservoirs (Recommended practice)	05	10	763.8	4.17

Problem identified: **Low production and poor body condition score due to infestation of ecto parasites (tick, mites, lice, etc.) in goat**

Technology assessed: **Management of ectoparacide by drug (flumethrinand/deltamethrin)**

KVK Ganjam conducted OFT on assessment drug (flumethrin/deltamethrin) drugs and for the control of ecto parasite in goat. This results in reduction of incidence of ecto parasite (ticks) by 333.33 % with 57.3% in net return.

Table: Performance of drug (flumethrin/deltamethrin) for ecto parasite management

Technology Details	No. of trials	Tick Incidence (%)	Av. Net return (Rs.)	B.C. Ratio
Farmers do not follow drug to control ecto parasite and generally follow local measures available (Farmers' practices)	10	65	1500	2.2
Control of ecto parasite by following schedule of drug (flumethrin/deltamethrin) (Recommended practice)	13	15	2360	2.81

Poultry

Problem identified: **Low income of Farm women due to low productivity of local breed in back yard/semi range system**

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

KVK Sagar, Puri, Sonpur, Bijapur, Kawardha, Korba, Korea, Raigarh and Bargarh conducted OFT on assessment of Improved dual purpose bird (Krishna J, Vanraja Grampriya, RIR, Black Rock and Rainbow rooster) in backyard free range system with better management results in increase in avg. body wt. by 56.77% and eggs by 50% with net return by 50.42 %.

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

Technology Details	No. of trials	Avg. body Weight at 6 month age (kg.)	Avg. No. of eggs/month	Return (Rs.)
Local colored bird (poor in egg and meat production) (Farmers' practices)	30	1.18	16	2340
Improved dual purpose color bird (Krishna J, Vanraja Grampriya, RIR, Black Rock and Rainbow rooster) with better health and feeding management (Recommended practice)	69	1.85	24	3520

Problem identified: **Mortality of chicks and poor production of backyard poultry in free range system due to poor management resulting in low production and profitability**

Technology assessed: **Assessment of aluminum electric brooder and plastic chick guard to control chick mortality**

KVK Jhabua conducted OFT on assessment of aluminum electric brooder and plastic chick guard to control chick mortality and production of backyard poultry results in reduction in chick mortality by 800 %, and increase in net return by 78.52%.

Table: Performance of aluminum electric brooder and plastic chick guard to control chick mortality

Technology Details	No. of trials	Mortality (%)	Net Return (Rs)	BC. Ratio
Backyard poultry in free range without balance feeding and improper care and management (Farmers' practices)	10	45	16300	2.69
Balance feeding with probiotic additive and proper health care and management (Recommended practice)	14	5	29300	3.06

Problem identified: **Low production of backyard poultry in free range system due to poor feeding management resulting in low production and profitability**

Technology assessed: **Assessment of *Azolla* feeding in poultry**

KVK Jajpur and Ganjam conducted OFT on Assessment of Azolla feeding in backyard poultry system results in increase in body wt. gain by 8-10%, and net return by 50%.

Table: Performance of *Azolla* feeding in poultry

Technology Details	No. of trials	Body Weight gain in grams per bird per month	Net Return per bird per month (Rs)	BC Ratio
Backyard poultry in free range without balance feeding and improper care and management (Farmers' practices)	10	370	120	2.0
Balance feeding with Azolla and proper health care and management (Recommended practice)	15	400	180	2.6

Duckery

Problem identified: Poor growth rate of desi type (Moti) ducks

Technology assessed: Evaluation of meat type duck, White Pekin

KVK Jajpur and Khurda conducted OFT on White Pekin duck and Jasugarh on cambal khaki duck under free range system results in increase in body wt. by 60.7%, net return by 87%, and 45.4% eggs/year with reduction in mortality.

Table: Performance of White Pekin and khaki cambal duck under free range system

Technology Details	No. of trials	Avg. No. of eggs/year	Body Weight at 12 month age (kg)	Net return per bird	BC Ratio
Rearing of desi type moti duck under free range condition without balance feeding and improper care and management (Farmers' practices)	05	110	2.8	294	3.06
Rearing of meat type white pekin duck/khaki cambal duck under free range with balance feeding and proper care and management (Recommended practice)	11	160	4.5	552	4.6

Fish Value Addition

Problem identified: Shelf life salted and dried fish is for only one month

Technology Assessed: Assessment of use of preservatives in salted and dried fish

KVK,Jagatsinghpur conducted on farm trials on Assessment of use of preservatives in salted and dried fish resulting in increase in shelf life of salted and dried fish up to 6 months.

Table: Effect of preservatives in salted and dried fish

Details	No. of trials	Shelf life of product	Visual inspection	Odour	Bacterial count after 1 month	Bacterial count after 6 months	Net Income (Rs./kg)	BC Ratio
Use of salt only (Farmers' practices)	26	1 month	Color changed after 1 month	Bad after 1 month	104	-	38	1.46
Application of preservatives as Sodium benzoate@0.25% and sodium dihydrogen		6 months	change in color after 6 month	Bad after 6 month	101	104	63	1.7

phosphate @1.5% and Potassium sorbate @0.5% of total salt (Recommended practice)								

Fish Breed Evaluation

Problem diagnosed: Mass mortality due to White spot disease in *Penaeus monodon*
Technology assessed: Assessment of resistant variety *Litopenaeus vannamei* in shrimp pond

KVK, Jagatsinghpur conducted on farm trials on Assessment of resistant variety *Litopenaeus vannamei* in shrimp pond resulting in increase in production @100% and net income 151%.

Table: Performance of resistant variety *Litopenaeus vannamei* in shrimp pond

Details	No of trial	Yield (q/ha)	Disease occurrence	Growth of shrimp (g)	Cost of cultivation (Rs/ha)	Net Income (Rs./ha)	BC Ratio
Culture of *Penaeus monodon* with stocking rate of 8/m2 **(Farmers' practices)**	5	37.5	Nil	22 (3 months)	6.25 lakh	8.75 lakh	2.4
Culture of *Litopenaeus vannamei* with stocking rate of 25/m2 **(Recommended practice)**		75	Nil	28 (3 months)	17.5 lakh	20 lakh	2.14

Fish Feed Management

Problem identified: Excess expenditure due to feed cost
Technology assessed: Assessment of reduced percentage of protein based feed for grow out carp culture

KVK, Jagatsinghpur conducted on farm trials on assessment of reduced percentage of protein based feed for grow out carp culture resulting in decrease in cost of cultivation 22.1% and increase in net income up to 12.8%

Table: Effect on reduced percentage of protein based feed for grow out carp culture

Details	No of trial	Yield (q/ha)	% change in yield	FCR	Cost of cultivation (Rs/ha)	Net Income (Rs./ha)	BC Ratio
Application of 30% protein based feed for first four month and 24% next four months of carp culture (Farmers' practices)	5	62.5		1.2	3,30,344	3,57,156	2.08
Application of 26% protein based feed for first four months and 20% next four months of carp culture (Recommended practice)		60	-4.16	1.5	2,57,038	4,02,962	2.56

Fish Production and Management

Problem diagnosed: Less income from only IMC culture
Technology assessed: Assessment of additional stocking of minor carp with IMC

KVK,Jagatsinghpur conducted on farm trials on additional stocking of minor carp with IMC resulting increase in production up to 40 % and net income up to 37.5%

Table: Effect of additional stocking of minor carp with IMC

Details	No of trail	Yield (q/ha)	Avg. Growth of IMC	Production of minor carp (q/ha)	Cost of cultivation (Rs/ha)	Net Income (Rs./ha)	BC Ratio
Fingerlings of IMC stocked @ 8000/ha (Farmers' practices)	5	40	710	Nil	2,00,000	2,40,000	2.2
Fingerlings of Minor carp stocked @8000/ha + IMC @ 8000/ha, Minor carp harvested after 4 months of cultivation (Recommended practice)		56	700	16.8	2,70,000	3,40,800	2.26

Fish Varietal Evaluation

Problem identified: Yield is less in only IMC culture

Technology Assessed: Assessment of performance of intercropping Java Punti (*Puntius gonionotus*)in three species IMC culture

KVK , Bhadrak and Dhenkanal conducted on farm trials on Assessment of performance of intercropping Java Punti in three species IMC culture resulting increase in yield 6.2% .

Table: Performance of intercropping java punti in composite fish culture

Details	No. of trials	Yield(q/ha)	Cost of cultivation(Rs)	Net Return (Rs)	B:C Ratio
Stocking of IMC only @5000/ha (Farmers' practices)	05	22.25	86500	96950	2.1
Stocking of IMC @4000/ha and java punti1000/ha (Recommended practice)	05	23.63	90200	117350	2.3

Fish Pond Water Management

Problem diagnosed: Less production of fish due to Poor water quality

Technology assessed: Assessment of performance of water probiotic in fish pond production.

KVK Bolangir, Nayagarh and Nuapada conducted OFT to assess the performance of water probiotic, Uni ecosense (Sanzyme India ltd.) @ 500 gm/ha /month in composite fish culture resulting in increase in fish production 33.2%. The potency of probiotic is 22×10^{9} and it contains *Bacillus subtilis, B.litheniformis, B.polimixa,Thiobacillus dinitrificanS, Lactobacillus sps., Aspergillus oryzae* and *A. niger*.

Table: Performance of water probiotic in composite fish culture

Details	No of trial	Yield(q/ha)	Cost of cultivation	Net Return(Rs.)	B:C ratio
Application of lime only(250 kg/ha) (Farmers' practices)	07	18.2	80110	100090	2.4
Application of lime(250 kg/ha) with water probiotic 500 gm/ha/month (Recommended practice)	07	24.25	93360	136040	2.7

Problem identified: Turbidity of newly excavated pond decreases fish production

Technology assessed: Assessment of Alum in controlling water turbidity in newly excavated pisciculture tank

KVK Dhenkanal and Mayurbhanj-II conducted OFT in assessment of Alum in controlling water turbidity in newly excavated pisciculture tank resulting in increase in transparancy 94% and fish production 9%.Alum was applied 40 kg/ha

Table: Performance of performance of alum in composite fish culture

Details	No of trial	Transparancy in cm by Sacchi disc	Yield(q/ha)	Cost of cultivation (Rs.)	Net Return(Rs.)	B:C ratio
Application of lime only (250 kg/ha) (Farmers' practices)	05	18	16.9	66550	54450	1.8
Application of lime (250 kg/ha)with alum 40 kg/ha (Recommended practice)	05	35	18.45	73200	70350	1.94

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 1844 were conducted on crops including oilseeds, pulses, cereals, vegetables crops, cash crops, agro forestry, millets , Important income generating enterprises , Home science and other important area covering the total area of 5810.19 ha in Zone VII including, 38953 units and 24591 beneficaries (Table 3.1).

Table 3.1: Summary of FLDs conducted in by KVKs of Zone-VII

Categories	No. of FLD	Area (ha)	Beneficiary
Cereal	373	1916.19	5450
Pulses	290	1610.44	4187
Oilseed	247	1079.85	4424
Vegetable	233	403.16	2196
Spices	132	336.69	1233
Fruit	25	43.77	196
Tuber	20	31.46	140
Flower	17	19.44	118
Sugar	13	24.2	90
Millet	10	47.4	130
Agroforestry	9	7.5	41
Fiber	8	30	84
Fodder	8	9.25	71
Intercropping	8	16.3	61
Forestry	7	5.3	43
ICM	6	33	87
Plantation	6	3.28	22
Medicinal	5	9.75	39
Integrated Farming System	1	0.4	4
Enterprises 1.Fodder**,** Integrated Fish Farming, Resource Conservation Technologies, Farm Mechanization, 2.Cattle, Drudgery Reduction, Nutritional, Nutritional security, Value addition, Income generation, Dairy, Duckery, Capacity Building & Group Dynamics,Goattry, Poultry, Storage,Value Adition, Bee Keeping, Lac cultivation, Mushroom, Vermicompost	37 200 (17521 units)	152.39	45 3741
Home Science	189 (21432 units)	-	2189
Total	**1844 (38953 units)**	**5779.77**	**24591**

Table 3.2: Summary of FLDs conducted in different areas by KVKs of Madhya Pradesh

Categories	No. of FLD	Area (ha)	Beneficiary
Pulses	175	948.89	2372
Oilseed	159	711.95	3413
Cereal	157	820.25	2425
Vegetable	92	150.65	648
Spices	77	238.45	754
Tuber	10	18.16	67
Flower	7	12.4	53
Fodder	6	8.25	56
Agroforestry	5	5	23
Fruit	5	15.19	37
Fiber	4	26	65
Medicinal	3	8.5	22
Forestry	2	2	14
Intercropping	2	7.2	18
Millet	2	3.4	12
Suger	2	7	10
Enterprises (units) 1. Farm Mechanization, Fodder , Integrated Fish Farming, Resource Conservation Technologies 2. Cattle, Drudgery Reduction, Nutritional security, Value addition, Income generation, Dairy, Duckery, Capacity Building & Group Dynamics, Fisheries, Goattry, Poultry, Storage,Value Adition, Bee Keeping, Lac cultivation, Mushroom, Vermicompost)	22 60 (2471 units)	40.76	25 1848
Home Science	75 (1556 units)	-	742
Total	**865 (4027 units)**	**3024.05**	**12604**

Table 3.3: Summary of FLDs conducted by KVKs of Chhattishgarh.

Categories	No. of FLD	Area (ha)	Beneficiary
Cereal	103	874.54	2099
Pulses	64	355.15	997
Oilseed	32	167.8	401
Vegetable	32	69.62	315
Spices	24	60.68	200
ICM	6	33	87
Millet	6	33	87
Tuber	3	8	28
Suger	2	8	15

Categories	No. of FLD	Area (ha)	Beneficiary
Fruit	1	12	12
Intercropping	1	5	13
Enterprises 1. Farm Mechanization, Fodder , Integrated Fish Farming, Resource Conservation Technologies	10	11.11	41
2.Cattle, Drudgery Reduction, Nutritional security, Value addition, Income generation, Dairy, Duckery, Capacity Building & Group Dynamics, Fisheries, Goattry, Poultry, Storage,Value Adition, Bee Keeping, Lac cultivation, Mushroom, Vermicompost	17 (91 units)		102
Home Science	19 (2 units)	-	185
Total	**320 (93 units)**	**1637.87**	**4582**

Table 3.4: Summary of FLDs conducted in different areas by KVKs of Odisha

Categories	No. of FLD	Area (ha)	Beneficiary
Cereal	113	221.4	926
Vegetable	109	182.89	1233
Oilseed	56	200.1	610
Pulses	51	306.4	818
Spices	31	37.56	279
Fruit	19	16.58	147
Flower	10	7.04	65
Sugar	9	9.2	65
Tuber	7	5.3	45
Plantation	6	3.28	22
Forestry	5	3.3	29
Intercropping	5	4.1	30
Agroforestry	4	2.5	18
Fiber	4	4	19
Fodder	2	1	15
Medicinal	2	1.25	17
Millet	2	11	31
Integrated Farming System	1	0.4	4

Categories	No. of FLD	Area (ha)	Beneficiary
Enterprises 1. Farm Mechanization, Fodder , Integrated Fish Farming, Resource Conservation Technologies 2.Cattle, Drudgery Reduction, Nutritional security, Value addition, Income generation, Dairy, Duckery, Capacity Building & Group Dynamics, Fisheries, Goattry, Poultry, Storage,Value Adition, Bee Keeping, Lac cultivation, Mushroom, Vermicompost	27 101 (14959 units)	100.52	65 1705
Home Science	95 (19874 units)	-	1262
Total	**659 (34833 units)**	**1117.81**	**7405**

Crop Diversification

Vegetables

Technology demonstrated	Crop-Area (ha)	Total Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
FLD on Broccoli cultivation.	0.8	20	169	350	113000	246750
Capsicum variety Indra with package & practices	2	20	Ongoing	-	87115	123482
Off-season cauliflower cultivation	0.4	10	New	142.8	-	2,07,100
Total	**3.2**	**50**				

Collector visiting KVK stall at Neelamguda Village of distt. Rayagada, Odisha on the occasion of Farmer's Fair

Farmer in his Brocoli field at Neelamguda Village of distt. Rayagada, Odisha

Rewa, M.P

Crop Diversification Can Change the Agriculture Scenario of The District

Introduction: Way of success from management graduate to success full agri entrepreneur Shri Akhilesh Pandey has done his MBA degree from A.P.S.University Rewa. He wished to utilize his management & marketing skill in his carrier. He met Mr. Anit Singh a progressive young farmer of Raipur Karchulian block & discussed his plan after setting inspiration from him Sh. Akhilesh Pandey contacted KVK Scientists in view of implementing his management & marketing skill in agriculture field.

KVK Interventions: Tomato variety (Kharif) HMT-256 with adopting proper nursery management, drip irrigation, INM & other technologies in 2 ha land.

Outcome: He was to much surprised with great joy by obtaining 448 qtl yield of Tomato. The total cost of cultivation was 68 thousand where as the gross return was 537600 (Rs. 1200 q/ha).He has invested about 1.5 lakh (50,000/acre) in Kharif 2013. He has gained Rs. 3.5 lakh as return till now. However he is expecting to gain Rs. 3-4 lakh more within 30-45 days.

ENTERPRISES- LPM

Technology demonstrated	Entrep - No.		Body weight(kg)		Average Net Return (Rs/Bird)	
		Total Participants	FP	Total Participants	FP	RP
Azolla as a source of protein in Buffalo	18	9	1.62	2.225	452	609
Breed Evaluation	4953	434	1.27	2.16	215	445
Poultry Management	6082	315	1.06	2.13	90	406.5
Total	**11053**	**758**				

Azolla feeding

Enterprises-Duckery

Technology demonstrated	Entrep - No.	Total Participants	Body Weight(kg/ Bird up to Six month)		Mortality (%)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP	FP	RP
Duck breed (Khaki Campbell)	105	30	5.53	6.23	52	76	348	425

Bargarh, Odisha

Duck Rearing for livelihood support

Introduction: Smt. Santosini Meher is an enthusiastic young dynamic farm-women of village Turkula. She always stands side by her husband in agricultural activities for raising their family income. Her family has two numbers of ponds in which they were used to practice traditional Pisciculture. During a diagnostic field visit she came in contact with KVK's scientists.

Intervention: By observing her curiosity toward duckery KVK advised her to start with rearing of 30 ducklings in a small scale basis. So she initially constructed a duck shed of 10'X4'X2.5' nearer to her pond. Then KVK, Bargarh provided her the khaki campbell breed of duck with the necessary technical guidance for the rearing management.

Outcome: After six months she started earning of Rs. 30-40 per day by selling the eggs. Out of this small unit she could able to earn a net profit of Rs. 16000 per annum by selling both egg and meat in the local market.For this unit she is expressed her heartily gratitude towards KVK as being a happy mother she is able to provide one egg daily to her child who was more preference towards egg than meat and fish. She has also planned to run this in a large scale with 100 no. of ducklings.

KVK, Intervention

Management of ducks

ENTERPRISES-FISHRIES

FLD: Partial harvesting of fish from community

Technology demonstrated	Crop- Area (ha) / Entrep - No.	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Fishries	119.45/616	485	17.09	34.37	87695.5	143461.3

ENTERPRISES-GOATERY

Sirohi Buck for up gradation of local goats

Technology demonstrated	No. of Enterprises	Total no. of Participants	Body Weight at 6 month(kg/Goat)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Feeding system in goats	100	50	9	11.02	1541.6	1854
Disease Management	160	70	7.03	8.5	4400	5750
Breed Evaluation	120	120				
Total	**380**	**240**				

ENTERPRISES-INCOME GENERATION

Technology demonstrated	Entrep - No.	Total no. of Participants	Yield (Kg/bed)		Average Net Return (Rs/Bed)	
			FP	RP	FP	RP
Musroom cultivation	2616	236	1.4	1.83	106.85	165.25

Technology Demonstrated	No. of Unit	No. of Beneficiaries	Economic Performance Indicator / Parameter						
			Production (kg./ Bed)		Yield(gm./kg dry straw)		Net Return		Saving in Rs
			FP	RP	FP	RP	FP	RP	
Mushroom	2985	302	1.03	1.45	608.4	865	72.28	140.5	84.5

Kanker, Chattishgarh

Mushroom spawn production: A profitable buisiness

Introduction - After passed her husband, Agas bai, shifted to singarbhat village 2 km away from district head quarter. She decided to do something unique on her own, but due to aloneness she fills helpless. She acquired information about mushroom production but lack of latest techniques and knowledge she was unable to produce mushroom, but her ambition was very strong to produce mushroom in large quantity. Her ambition took her to Krishi Vigyan Kendra, where she came in contact with KVK scientists and trained under Tribal Sub Plan at Krishi Vigyan Kendra Kanker.

Intervention - After training she gets enough knowledge about mushroom production. She purchase mushroom spawn from Krishi Vigyan Kendra Kanker and started mushroom production and gets good returned of about Rs. 15000/- net profit from it within two months. Her son in law also starts help her in mushroom production. He is very keen in doing new things, and decides to make a low cost inoculation chamber for her grandmother. He contacted with KVK, scientist and developed a low cost of about Rs.1000/- inoculation chamber and successfully inoculate and produce mushroom spawn. It is made up of white transparent plastic container size 1.5' x 2'. It is noteworthy that all the spawn packets are free from any contamination and mycelium running well in wheat medium. Whereas in the

market well equipped and sophisticated laminar air flow is more costly and many fold expensive as compared to low cost inoculation chamber.

Outcome - Seeing all the work, the nearby villager's contacted Agasi bai for mushroom production technique also demands low cost inoculation chambers for purchase.

Mushroom Production at village Singarbhat Kanker by Smt. Agas Bai

Hon'ble VC IGKV visited at Singarbhat growing mushroom and showing innovative low ssscost inoculation chamber

INTEGRATED CROP MANAGEMENT

Technology demonstrated	Crop- Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Cereal						
Maize	240.6	1010	24.2	36.79	15253	28412.4
Paddy	192.1	508	30.96	42.81	20476.4	33114.9
Sweet corn	5	10	83.06	131.3	25540	85100
Wheat	199.4	473	34.99	44.28	37825	51031
Fruit						
Banana	1.08	13	358	400	214800	247500
Ber	12	12	-	-	-	-
Intercropping						
Intercropping	8.1	38	37.56	50.52	26968.2	44634
Silvi pasture						
Fodder production	2	5	640	790	305000	376750
Millet						
Millet	5	14	14.25	21.6	5300	12255
Oilseed						
Ground nut	41	105	14.87	19.62	28034	42255.71
Linseed	24	50	4.93	7.01	8909	15169.6
Mustard	203.4	492	8.82	11.93	15646	23865.5
Niger	35.8	97	2.75	4.59	4537.56	10328.67
Sesame	35	101	4.22	5.57	11344.64	17354.9
Soybean	173.8	2040	11.06	14.27	21669.5	30725.5
Sunflower	29	47	12.35	15.17	37506	50587.5
Plantation						
Cassava.	0.1	4	212	290	68800	98500
Pulse						
Blackgram	145.2	339	5.88	7.72	11869	16746.3
Chick pea	365.4	903	10.03	12.81	25980.54	32187.94
Field Pea	33	80	9.35	15.32	28875	57242
Green gram	140.2	300	6.65	8.44	13457.15	20066.38
Lentil	23	62	4.84	7.73	8177.33	17062.66
Pigeon pea	114.2	315	9.44	13.33	22475.26	34211.2
Spice						
Chilli	11	30	192.5	228.5	148902.5	170846
Ginger	2.24	8	136	178	254100	350100
Onion	2.6	22	215	241	131123	195200
Turmeric	2.49	8	128	137.6		
Tuber						
Potato	5	13	145	230	80400	138300
Vegetable						
Bitter gourd	1	9	81	117	31000	59000
Brinjal	6.5	10	175	209	92400	116900
Cabbage	5.3	28	237.5	345	49000	92150
Cauliflower	5.9	38	181	259	65100	132400
Okra	6.5	40	68	90	29700	55600
Pumpkin	1.48	26	237.4	267.2	41117.5	49433
Tomato	60.8	176	216.26	306.45	120495.3	170731.8
Total	**2139.19**	**7416**				

Deogarh, Odisha

Successful experiences with small vegetable grower

Introduction - Raghava Ch. Sahoo is a 35 years old youth of Niktimal village of Tileibani block of Deogarh district. A certificate of passing +2 examination gave him nothing except desperation. He did not find a job anywhere. His parental assets were not as much to enable him to lead a prestigious living. From the 5 acres of upland, leaving 3 acres in Rice cultivation, hardly he was harvesting a quintal of greengram from the rest.

Intervention - Two years ago he got an opportunity to attend a KVK sponsored training programme on crop diversification in upland situation. Later on, he discussed with the KVK scientists who showed the way for best utilisation of the uplands throughout the year with all scientific cultivation practices. KVK facilitated him to have a subsidised bore well. He became beneficiary of their OFT, FLD on kharif brinjal, INM in tomato and cauliflower like off-season vegetables and IPM practices.

Outcome - Now Mr Sahoo is earning a net income of Rs. 1,15,000.00 annually in place of Rs.20,000.00 only. Within these two years, he has purchased a colour TV and a cell phone. Very recently, he has bought a bike. Now, he is in an independent profession and he has a good earning as well.His poly house and vermin-compost tank which are under construction now will bring more success in his endeavour. Hon'ble Governor of Odisha recently felicitated him as a progressive farmer of the state on the eve of foundation ceremony of Orissa University of Agriculture and Technology.

Low cost Polyhouse

Spraying of boron in Tomato

Harvested tomatoes

Off season Cauliflower

Quality Curds

Cost reduction in Brinjal cultivation

Rayagada, Odisha

Broccoli and Red cabbage: A profitable vegetable

1.	**Name and address of farmers**	Mr. Sanjay Ranguli Village : Bhamini Block: Ramnaguda Dist: Rayagada
2.	**Activities undertaken**	Popularisation of high value cole vegetable Broccoli in the campus of KVK as well as in farmer's field.
3.	**Involvement of KVK**	Basically Mr. Sanjay Ranguli, a leading bean grower in his locality in Bhamini of Ramnaguda block. He knew broccoli very well. But he thinks marketing might be a big problem. During the year 2013-14, Rabi Broccoli and red cabbage were demonstrated in the KVK, campus itself. As per his keen interest, we encouraged him to grow broccoli in 20 cents area of his field. All due cares were taken by him and KVK. The sizable broccoli (avg. 800 gm.) were taken to local market but price offered was at par with cauliflower. Finally, he met fast food shop and leading hotels in Gunupur. His broccoli were taken @ Rs. 15/- to Rs. 40/- per piece. From his 20 cents of land he produced around 24 qtl. His total income was Rs. 50, 200/-. He decided to grow broccoli in 1 acre in the coming rabi season and tie up with hotels and restaurant with Gunupur, Rayagada etc.
4.	**Success made**	This year he grew broccoli in 20 cents area and red cabbage in around 10 cent. The local hotels, restaurants, some local consumers and farmers were come to know the broccoli and red cabbage. Recently a leading SHG members from Gunupur from have visited the red cabbage field in the KVK campus.
5.	**Future strategy**	Now Mr. Sanjay Ranguli is much more interested to grow this crop in large area.
6.	**Impact on other farmer**	Being a progressive farmer Mr. Ranguli has become an initiating agent of growing high value vegetable broccoli and red cabbage. The marketing was not a big problem.

Mr. Ranguli in his Brocoli field

Mr. Ranguli in his Red Cabbage (var. Scarlet) field

Collector visiting KVK stall at
Neelamguda village of distt. Rayagada, Odisha on the occasion of Farmer's Fair

INTEGRATED DISEASE MANAGEMENT

Technology demonstrated	Crop- Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Cereal						
Paddy	54.8	187	35.17	41.8	22716.14	29086.95
Wheat	4	10	32.5	37.07	29785	35860.5
Medicinal						
Ajwain	2.5	5	9.6	11.65	30500	39050
Betel vine	0.05	5	44.6	52	806000	1168000
Oilseed						
Ground Nut	7.8	32	14.37	18.75	29865	45580
Mustard	2	5	13.16	14.77	22562	26514
Sesame	3	10	3.03	6.19	25650	38027.5
Soybean	1	12	12.1	14.84	11080	14980
Pulse						
Black gram	10	39	6.16	8.6	11956.3	18190.25
Chickpea	56	149	7.77	10.7	12707.5	19384.44
Green gram	5	38	5.46	6.83	8746.25	13201.75
Pigeon pea	6	12	11.1	13.43	17436	25609
Spice						
Chilli	6.5	25	73.06	114.76	55766.6	111606.6
Coriander	5	12	11.49	13.11	34100	40250
Ginger	4	23	98.23	112.83	181130	219250
Onion	6.4	20	197.4	237.53	98520	125893.3
Tuber						
Potato	7.5	27	169.9	223.2	87898.6	115263
Colocasia	6	10	108.11	166.88	101623	114552
Vegetable						

Technology demonstrated	Crop- Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Bitter guard	0.4	13	57	72	117500	140000
Brinjal	10	56	204.31	257.85	101750.66	133260.3
Cucumber	2	10	81.6	104.25	44850	68030
Okra	4	35	61.73	85.68	89886.6	96686.6
Pointed gourd	6	35	122.4	144.7	250000	315600
Tomato	7.6	40	153.51	202.4	61750.2	90006.75
Total	**217.55**	**810**				

Paddy Blast

Kandhamal, Odisha

Raikia Bean cultivation is profitable for tribal people.

Introduction: - Sri Rabindra Pradhan of village Sudhipada of G.Udayagiri block is a traditional cultivator of Raikia bean. Initially he cultivated one acre of Raikia bean with traditional practices. He got an yield of 30q from his one acre of land & selling it in the local market @ Rs.1500/q with a net profit of Rs./-26,700/acre. He was not well aware about scientific method of cultivation which debarred him from adopting new technologies as well as rain fed farming situation al so contributed to lower yield.

Intervention: - K.V.K, Kandhamal has trained the farmers on the benefit of seed treatment, line sowing with application of FYM. Front Line Demonstrations were conducted on Plant protection measures to control bacterial leaf blight & use of bio fertilizers, bio pesticides & INM.

Outcome:- Due to heavy demand of Raikia bean in the market, KVK has advised him to go for more area coverage under raikia bean cultivation & provide him technical guidance. In the year 2013-14, he has cultivated Raikia Bean in four acre of land for commercial purpose. He got a yield of 224q from his four acre land & selling it @ Rs.1500/q, he got a gross income of Rs.336000/- & a net profit of Rs.2,80000/-. Raikia bean production is a remunerative enterprises for the resource poor farmers. Seed treatment, line sowing, use of staking materials, use of bio fertiliser and INM , IPM practices resulted in production of good quality of pod yield with Benefit –cost ratio of 3.4. Due to his achievement Sri Pradhan was awarded by Hon'ble Governor of Odisha in the OUAT foundation day as a progressive farmer.

Raikia bean at Vegetative stage

Raikia bean at harvesting stage

Farmer receiving the award from Hon'bl Governor of Odisha

INTEGRATED FARMING SYSTEM

Technology demonstrated	Crop-Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Fishrie s + Fruit + Poultry + Duckry	1.4	12	25	25 qtl + papaya, banana, abanaraja, duckery	100000	135000
Karonda on waste land	1.05	10	-	92.6% survival of the plant		
Pigeon Pea + Anola	2	5	(Aonla alon) 130	(Aonla+ Pigeon pea) 130+6.6	89000	102880
Teak + Turmeric	0.1	2	161.5	184.85	240175	289550
Total	**4.55**	**29**				

Jagdalpur (Bastar),Chattishgarh

Integrated farming system models for marginal and small tribal farmers of Bastar

Background

- This technology is mainly targeted the upland and midland situations
- Available land are Homestead garden - Badi (5%), Marhan (30%) and Tikra (25%) in Upland
- In Bastar region about 6-8 per cent (50,000 - 70,000 ha) area of total land are suitable for the horticulture based farming situation
- Livelihood improvement of tribals
- Income generation
- Food safety, nutrition availability and sustainability
- Include Fruit plants, (Mango, Chiku, Kaju, Citrus and Aonla) and fuel plant (*Acasiya*, *Glyrisidia, Mangium*, Arjuna etc.) with crops as intercultural

Interventions of KVK-Bastar (2003) : Secret of Success as Progressive Framers

- Tube well for irrigation from SGSY Scheme
- KVK provided skill up gradation through training, FLD's, OFT, Exposure visit according to need base technology
- Operating round the year cultivation of improved varieties/hybrids with recommended package of practices
- Sprinkler and Drip irrigation under scheme of NHM & Agriculture Department
- Well planned layout of improved varieties of fruits Mango (25), Banana (100), Coconut (50) along with intercropping of vegetables
- NADEP (2), Vermicomposting (2), FYM, balance fertilizer application
- Cropping intensity 275 (%)
- 25 Poultry Birds Improved Breed (White Leg Horne) & 6 Naghans Duck and One Cow 4-5 Liter per day Milk production
- Fruits of mango, banana, coconut and marigold selling in local market for additional income



Field view of Sh. Tulsiram at Malgaon village of Bakawand block

Agri-horti Model Visited by Dr. K. D. Kokate, Hon'ble DDG (AE) ICAR

Sh. Mangal Singh Bansal, Hon'ble Minister of state (Law & Transportation) at Krishi Vigyan mela, Pusa IARI, New Delhi

Progressive farmers award received from Chief Minister, C.G. Govt. Dr. Raman Singh

INTEGRATED NUTRIENT MANAGEMENT

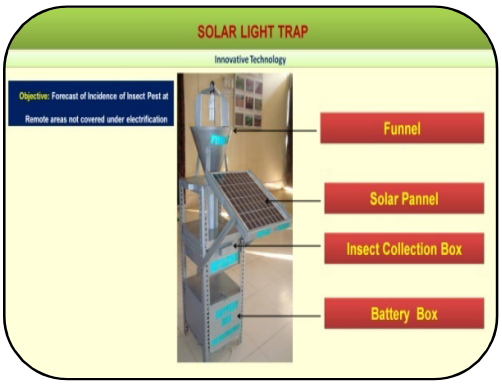
Technology demonstrated	Crop- Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Cereal						
Maize	11.25	40	43.44	53.14	29490	39762.5
Paddy	79.5	292	35.68	42.61	25012.8	37219.3
Sorghum	2	5	25.54	30.48	29988	36744
Wheat	42.5	112	32.25	38.29	31154.9	37261.6
Fiber						
Cotton	3	10	14.12	17.96	37530.7	49267.5
Flower						
Marigold	3.5	15	107.55	135.2	46800	68760.5
Fruit						
Citrus	1.69	14	26	30	42,000	54,000
Papaya	0.8	15	451	559	33228	62701
Medicinal						
Betelvine	1.2	12	46.42	52.12	891200	1147200
Oilseed						
Groundnut	28	108	13.37	17.56	30238.3	45516.6
Linseed	2	5	7.5	9.84	10900	16140
Niger	5	21	1.9	3.45	4600	9800
Sesamum	11	30	6.48	8.54	21051.5	30855.75
Soybean	47.5	114	10.68	13.6	26372.9	35565.7
Sunflower	3.3	25	13.35	16.95	37150	53340
Pulse						
Black gram	7	16	7.25	10.22	24937.5	37015
Chickpea	44.9	123	11.16	13.11	20692.64	26774.94
Field pea	7	20	11.97	15.82	25775	38600
Green gram	66.2	184	5.56	7.1	14036	20320
Pigeon Pea	16.4	44	8.96	13.01	25783.6	37146.2
Spice						

Technology demonstrated	Crop- Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Chilli	4.4	20	106.85	120.35	88855.06	103022.1
Coriande	2	10	3.3	4.2	17700	23200
Garlic	15	46	120.05	140.45	171314	224437.6
Ginger	1	5	109.6	155.6	190000	194900
Kharif Onion	2.4	10	169.53	189.32	136002.9	154685
Onion	19.49	75	229.12	287.98	114730.69	116490
Turmeric	1	5	108.9	166.3	49390	102730
Tuber						
Colocassia	3	10	314	277.5	137900	118255
Potato	4	15	202.35	247.12	95147.8	154879
Vegetable						
Brinjal	29.6	72	266.45	315.5	106278	131621
Cabbage	14	70	215.27	296.77	60937.5	93212.5
Cauliflower	5.8	35	220.18	261.6	86979.5	111698.4
Cucurbits	5.2	13	138	158	85700	103163
French Beans	2.8	23	68	89	58000	82200
Garden Pea	10	70	76.7	118.9	70310	120850
Okra	3.3	35	136.5	166	89500	101400
Radish	2.5	33	146.5	169.26	77320	96926.3
Runner Bean	2	10	82.4	139.6	53980	112120
Tamato	10	54	304.78	356.67	126249.8	157832.6
Total	**521.68**	**1816**				

INTEGRATED PEST MANAGEMENT

Technology demonstrated	Crop- Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Cereal						
Maize	9	35	31.43	37.19	16042.2	21378.4
Paddy	40.6	184	35.1	41.87	27620.17	40171.94
Wheat	19	52	33.71	38.93	33973.1	43537.7
Fiber						
Cotton	24	60	21.2	25.11	69157.66	84859.66
Fruit						
Mango	4.5	29	-			
Papaya	0.4	5	329	407	115750	145510
Oilseed						
Coconut	1	10				
Groundnut	2	10	15.75	18.03	46280	54740
Linseed	1.4	7	4.29	6.75	5480	11650
Mustard	16.4	56	7.49	8.66	8742.12	13527.98
Soybean	38.8	98	12.06	15.05	22352.78	29811.39
Pulse						
Black gram	3.4	15	6.61	8.01	15420	20057.33

Technology demonstrated	Crop- Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Chickpea	52.2	145	9.32	11.91	13229.7	20064.35
Green gram	6	10	5.2	7.4	7,600	16,300
Pigeon Pea	2.4	17	9.75	14.45	19516.5	35751.5
Spice						
Chilli	10.4	25	120.42	137.92	82352.96	97521.2
Coriander	102	205	11.1	11.84	57896.5	76479.5
Garlic	2	5	88.6	128.5	168000	265250
Onion	11.2	43	188.47	198.22	66560.5	82910
Sugar cane	1	5	95.9	115.2	167480	185440
Vegetable						
Bitter guard	2.4	20	93.04	107.03	71722.33	125899
Brinjal	14.9	94	205.7	261.06	100284.09	141930.1
Cabbage	9	43	184.2	216.06	91972	111960
Cauliflower	1	5	160.2	221.6	44790	65050
Cucumber	2	10	252	298	92,900	1,17,600
Okra	1.2	18	97.3	119.95	51023	50238.5
Tomato	9	54	181.45	205	104951.5	120207.2
Watermelon	1	10	204	298	24200	43200
Total	**388.2**	**1270**				



Solar Light Lamp

Use of insecticide

INTEGRATED PLANT NUTRIENT MANAGEMENT

Technology demonstrated	Crop- Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Chickpea	5	13	12.2	18	24500	40400
Paddy	6	15	30.95	42.78	53590	69892.5
Pigeon Pea	2.4	6	12.13	13.58	51631	60217
Soybean	2	5	9.1	11.42	8250	17269
Wheat	5	13	23.5	42	19600	47700
Total	**20.4**	**52**				

NUTRITIONAL SECURITY

Technology demonstrated	Entrep - No. / Crop area(ha)	Total no. of Participants	Results (Kg/day)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Preparation of weaning mix for the children as per RDA	13	13	10	15	240	630
Vegetable	14	95	100.05	173.35	56300.28	11185.08
Total	**27**	**108**				

Value added soya product

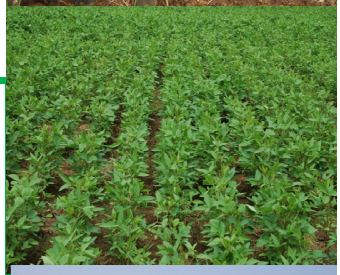
RESOURCE CONSESORVATION TECHNOLOGY

Technology demonstrated	Entrep - No. / Crop area(ha)	Total no. of Participants	Results (Kg/day)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Intercropping						
Eucalyptus + wheat	1	5	43.7	41.2	52235	46960
Cereal						
Paddy	61.6	146	38.37	50.58	43596.75	55330
Wheat	9	20	39.16	45.99	45649.6	50027
Oilseed						
Mustard	5	30	8	21.69	19000	53000
Soybean	13	32	9.86	11.34	20827.46	25957.2
Pulse						
Pigeon pea	5	5	1642	1982	45802	57566
Vegetable						
Tomato	5	5	218	342	59000	101000
Total	**99.6**	**243**				

CONSERVATION AGRICULTURE THROUGH RESOURCE CONSERVATION TECHNOLOGY

Moisture stress during critical growth stages of the crops

Custom Hiring Centre - 23



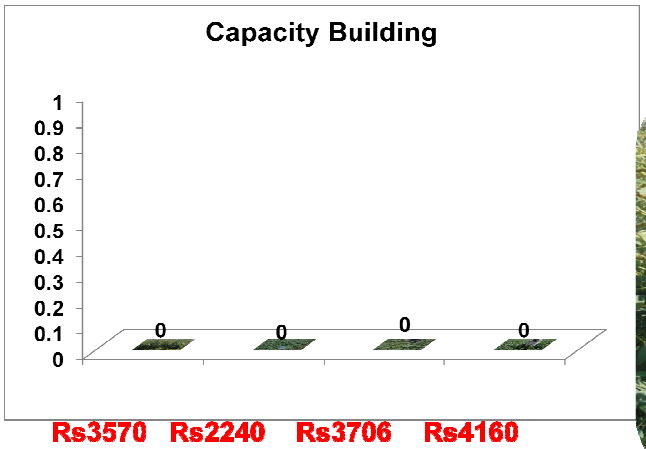
Moisture conservation and water saving Technologies

- Deep summer ploughing
- Ridge and furrow sowing of kharif pulses and oilseeds
- Dry sowing of wheat
- Zero tillage sowing of wheat
- Advancement in sowing time of Rabi crops
- Mulching

In-situ moisture conservation

Intervention : Ridge and furrow Sowing

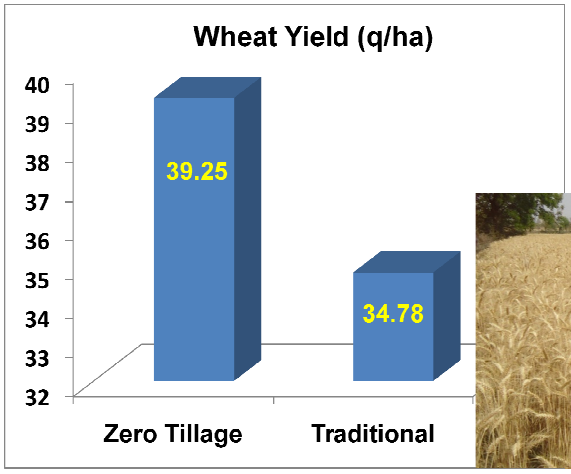
No. of villages covered - 179
Area covered - 1868 ha
No. of Farmers - 1538



Appropriate Utilization of Available Moisture

Intervention : Zero tillage

No. of villages covered - 87
Area covered - 998 ha
No. of Farmers - 614



VARIETAL EVALUATION

Technology demonstrated	Crop- Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Cereal						
Babycorn	3	18	40.2	19.01	22590	57425
Maize	104.5	238	31.52	43.5	20695.6	46239.11
Barley	4	10	14.8	18.03	12552	16719
Oat	3	30	-	486.03	40000	52200
Paddy	380	915	34.02	44.92	23782.4	35959.08
Wheat	248.8	573	31.7	39.76	31649.9	42757.6
Flower						
Gaillardia	1.4	6	249.2	221.6	104480	166340
Marigold	15.34	97	89.39	127.4	72103.33	116946.6
Fodder						
Berseem	7.5	43	244.33	318	34466.66	49783.33
Oat	0.75	3	174	223	35500	45750
Fruit						
Banana	1.4	10	286	514	197108.5	286607
Papaya	4.0	31	530.4	885.54	204311	368318.3
Medicinal						
Ajwain	1	5	10.28	12.34	87800	129080
MIllet						
Finger Millet	34	84	10.34	16.67	8237	21456
Kodo millet (Kodo)	7.4	27	7.43	11.36	5067.33	11933.33
Little millet (Kutki)	1	15	4.3	7.9	3180	9224
Oilseed						
Groundnut	27.4	72	14.19	18.26	37993	53002.33
Linseed	16	52	4.56	7.02	8096.6	14058.2
Mustard	75	184	8.06	10.57	15365.2	19704.6
Niger	16.6	54	3.07	4.79	7721.25	13547.75
Safflower	12.6	28	5.05	6.2	7740	11550
Sesame	26	67	4.34	5.88	22003	31147.2
Soybean	67.4	155	9.17	11.45	19216.1	25569.4
Sunflower	11	26	12.8	17.4	23460	35080
Total	**1069.09**	**2743**				

Seoni, M.P

District Level innovation on farmers Participatory Paddy Hybrid Seed Production - A needful step to sustain farming

Introduction - Seoni district comes under disadvantageous district of India the district is characterized by dominating tribal population. Total population of the district is 13,78,876 out of which 11, 76,608 come under the scheduled caste and scheduled tribe. The Economy of district is predominantly based on agriculture and the main food crops are Paddy, Soybean, Maize in Kharif and Wheat, Gram in Rabi

KVK Intervention - To make quality hybrid seed available at village level Krishi Vigyan Kendra Seoni has initiated an ambitious programme of farmer's participatory Paddy hybrid Seed Production in farmers adopted village Kanchna, Dondiwada and the nearby villages. A

series of trials on hybrid paddy seed production were conducted from Rabi 2009-10 to Kharif 2012 to popularize the enterprise.

Hybrid Paddy seed production (JRH -5) programme at Farmers field

S.N.	Year/ Season	Area (ha)	Production (q)	Productivity(kg/ha)
1.	Rabi 2009-10	5.0	18.05	361
2.	Kharif 2010	4.0	18.68	466
3.	Rabi 2010 - 11	4.0	18.69	467
4.	KhariF 2011	6.0	45.60	685
5.	Rabi 2011-12	4.2	26.96	674
6.	Kharif 2012	10.0	78.00	780
	Total	**34.0**	**201.21**	**559**

Outcome - Being inspired by the success of Shri A.P. Bhoyar, A Total of 38 Paddy growers are now registered under hybrid seed production of paddy by the KVK, and started production of hybrid paddy seed variety JRH-5 in 18 ha. In last three years they are produce about 202 qt. Hybrid seed. The average productivity of hybrid seed in 5.59 q/ha. The seed has been distributed in 3300 acre which produce 92400 qt paddy. A Successful Paddy Hybrid growing farmer Mr. Ayodhya Prasad Bhoyar of KVK adopted village Kanchna has got district level as well as State level Excellent farmer award by Agriculture department Government of M.P.






Balrampur, C.G.

Entrepreneurship development of farmer's Group

Introduction: - Name of the group: - Surya Swasahayta Samooh (Changro)
Name of Village: - Changro(Block-Shankargarh, Dist-Balrampur-Ramanujganj)
Total No. of members :- 15
Name of members: - Smt. Devanti (President), Smt. Mooni (Secretary) , Smt.Poonam , Smt Shete , Smt Rangini, Smt Manet, Smt Barsati , Smt Karmaeet , Smt Bidal, Smt Dilpati, Smt Sita, Smt Parasmani, Smt Pateswari, Smt Phoolkumari & Smt Chandrawati.

Intervention - Prior to intervention of KVK the Jeeraphool growing farmers of the village were selling raw Rice to the traders @ Rs. 19 to 23 per kg. with 67% recovery of rice they were earning Rs. 30-32 per kg. of scented jeeraphool rice.However after milling and packaging of the same traders were selling @ Rs. 52-55 per kg. After intervention of KVK, Scientists came to know about this fact and submitted the proposal under TSP to bridge up the gap and provide the additional profit of Rs. 20.00 per kg to the farmers by farming the Farmers' Interest Group namely **Surya swayam sahayata samooh** .KVK scintists advised the farmers not to sell raw Rice and facilitated the tribal group for milling, packaging in 5 kg. Packing with **Changro Jeeraphool rice** as brand name as per their will under TSP. Since no chemical fertilizer and pesticide is being used by the farmers this rice contains aroma and good marketing potential. It was proved true when this group sold their 7.0 Qtl. Rice in the Rashtriya Krishi Vigyan Mela stall in IGKV Raipur during Feb.22-25, 2014.In their path of progress **Dr. S.K.Patil Hon'ble Vice-Chancellor of IGKV provided them a Bag Closure Machine** for packing of the packets on 13.02.2014 at KVK Balrampur.The group was given an Electronic Weighing Machine by the Collector, Balrampur for weighment of 5 kg packets.District Administration was impressed with the efforts of KVK and farmers , and provided the group a mini Rice Mill from Integrated Action Plan (Budget for Naxal affected areas).

Outcome - At present this SHG is working in profit and moving in forward/right direction. KVK has provided technical knowledge, moral support and technical inputs to this SHG for the successful milling, packaging and marketing of scented variety of Jeeraphool Rice. In the last season this group has marketed about 12 q of Jeeraphool Rice @ Rs. 250/- per packet of 5 kg, thus earning about Rs. 60000 after the investment of Rs. 36000 only and by doing so.There is a huge demand for this organic rice from many consumers across the state and traders .This group has emerged as profittable SHG in this district and now capable to develop their entrepreneurship.

During last two years efforts of KVK the area under Jeeraphool is increasing, however the area under hybrid rice is increasing in the rest parts of the district. The purchase of Rice in the cooperative society Dipadih which includes Changro was minimum.

Zeeraphool dhan

Formation of FIG

Distribution Bag Closer Machine to the farmers by Dr. S.K. Patil, Hon'ble Vice Chancellor, IGKV, Raipur

Winnowing of Jeeraphool

WEED MANAGEMENT

Technology demonstrated	Crop- Area (ha)	Total no. of Participants	Results (q/ha)		Average Net Return (Rs/ha)	
			FP	RP	FP	RP
Cereal						
Maize	4	10	20.35	25.91	10538	16768
Paddy	69.94	185	34.11	41.69	24687.9	34371.4
Wheat	35.7	87	34.13	40.12	36645.35	45968.2
Medicinal						
Isabgol	5	12	10.61	12.17	52230	61212
Oilseed						
Groundnut	5	20	18.15	22.9	33155	47780
Mustard	4	10	10.55	12.9	17667.5	23228
Niger	5	10	4.1	6.2	7050	12470
Soybean	19	51	10.15	12.65	27895.3	38418.18
Pulse						
Black gram	5	12	8.06	9.58	21902	27636
Chickpea	4	10	8.35	10.37	6640	12747.5
Green gram	4	10	7.14	9.1	12092.5	17335
Pigeon Pea	3.2	9	5.25	8.8	3228	14168
Spice						
Garlic	4	15	80.91	97.48	147719.5	180698
Onion	15.3	65	212.01	245.35	75153.37	94205.12
Turmeric	3	24	90.6	140.7	343300	813850
Tuber						
Potato	3.16	10	210.23	241.04	163330.4	192739.4
Vegetable						
Cauliflower	1	5	182.4	203.6	65,840	82,810
Guar	1	10	5.38	6.85	8564	12180
Tomato	4	20	232.26	276.9	93645	144800
Total	**195.3**	**575**				

Conoweeder in Paddy

INCOME GENERATION

Technology Demonstrated	No. of Unit	No. of Beneficiaries	Economic Performance Indicator / Parameter						
			Production per unit (kg/Bird/ year)		Egg Yield(No./ Bird))		Net Return(Rs./Unit)		Saving in Rs
			FP	RP	FP	RP	FP	RP	
Poultry Production	1855	200	1.17	2.4	60	150	543	977.66	531
Total	**1855**	**200**							

Jhabua, M.P.

Livelihood Security and Income through High Value Poultry Breed Kadaknath

(Native black bird of Jhabua, Madhya Pradesh)

Background

An Indian poultry breed, *Kadaknath* is native to Jhabua district of Madhya Pradesh which is reared by most of the tribes as backyard without any vaccination and hygiene and offered only kitchen west and small amount of grains, therefore its growth rate is very low and mortality rate is high.The original name of Kadaknath was “kalamasi” meaning the fowl having black flesh. The Kadaknath birds reveal appreciable degree of resistance to diseases than any other exotic breeds of fowl in its natural habitat in free ranging. Kadaknath birds also resistant to extreme climatic environment like poor housing, poor management and poor feeding. The meat & egg of Kadaknath are rich source of Protein (25-47%) and lower source of Fat (1-5%).

Krishi Vigyan Kendra, Jhabua observed that high market demand, existence of backyard poultry system of its rearing, slow growth on natural feeding (186 days sexual maturity) and more than 50 % mortality before maturity are major factors which affect the survival, growth and productivity of this breed.

Description of technology

- Entrepreneur : Kadaknath Rearing
- Breed : Kadaknath
- Rearing System : Deep liter system (10X12 sq feet)
- Vaccination : Vaccine (F1/B1, Lasota, R2B and *gumboro*
- Balance Feed : Starter, Finisher

Kadaknath hatchery established

Hatchery inauguration

Hatcher and shetter machine with eggs

➢Now 19000 chicks of *Kadaknath* was produced in this hatchery unit and made available to *Kadaknath* growers costing Rs. 8.15 lakh

Eggs in hatchery	3050
Chicks in brooder house	900
Birds in grower house	650
Birds in layer house	450

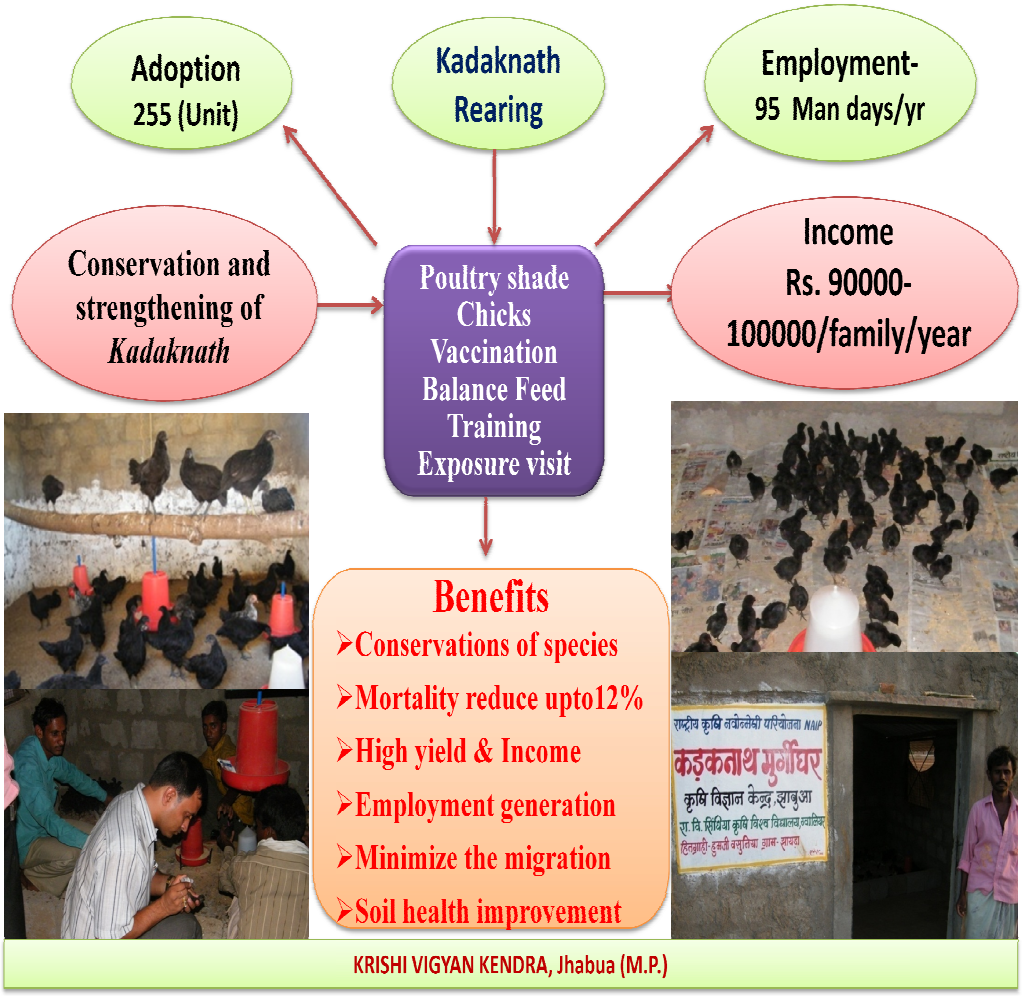
Layer house

Brooder house

Success Point

- Kadaknath is a native breed of Jhabua, which is reared by most of the tribes as backyard.
- The Kadaknath birds reveal appreciable degree of resistance to diseases than any other exotic breeds of fowl in its natural habitat in free ranging.
- Kadaknath birds resistant to extreme climatic environment, poor housing, poor management and poor feeding.
- Higher monetary return due to higher market Price High market demand

Out come


Adoption
255 (Unit)
Kadaknath
Rearing
Employment-
95 Man days/yr
Conservation and
strengthening of
Kadaknath
Poultry shade
Chicks
Vaccination
Balance Feed
Training
Exposure visit
Income
Rs. 90000-
100000/family/year
Benefits
➢Conservations of species
➢Mortality reduce upto12%
➢High yield & Income
➢Employment generation
➢Minimize the migration
➢Soil health improvement
कड़कनाथ मुर्गीघर
कृषि विज्ञान केन्द्र, झाबुआ
KRISHI VIGYAN KENDRA, Jhabua (M.P.)

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, 8286 courses benefitted to 2, 00,365 participants including farmers and farm women, rural youth, extension personnel and sponsored from different agencies given in Table 4.1.

Table 4.1: State wise, category wise training programmes conducted by the KVKs in Zone VII during 2013-14

Type	No. of courses				Participants			
	CG	MP	Odisha	Zone VII	CG	MP	Odisha	Zone VII
Farmers & Farm Women	1077	2922	1022	5021	41625	49335	25541	116501
Extension personnels	76	247	117	440	2552	6628	1536	10716
Rural youth	171	170	210	551	3964	3710	3764	11438
Sponsored	729	1518	27	2274	23978	61217	493	61710
Total	**2053**	**4857**	**1376**	**8286**	**72119**	**120890**	**31334**	**200365**

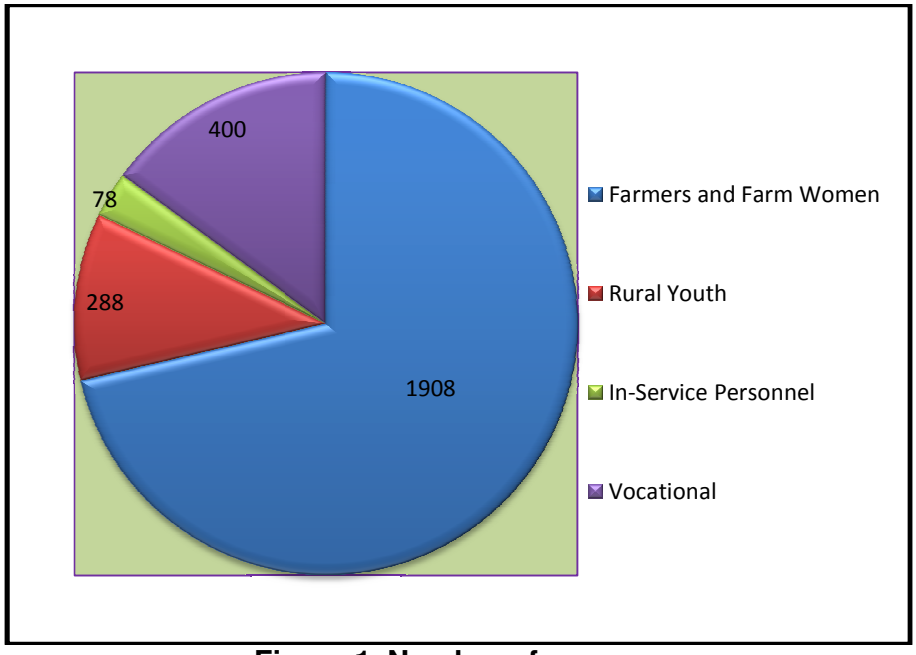


Figure 1. Number of courses

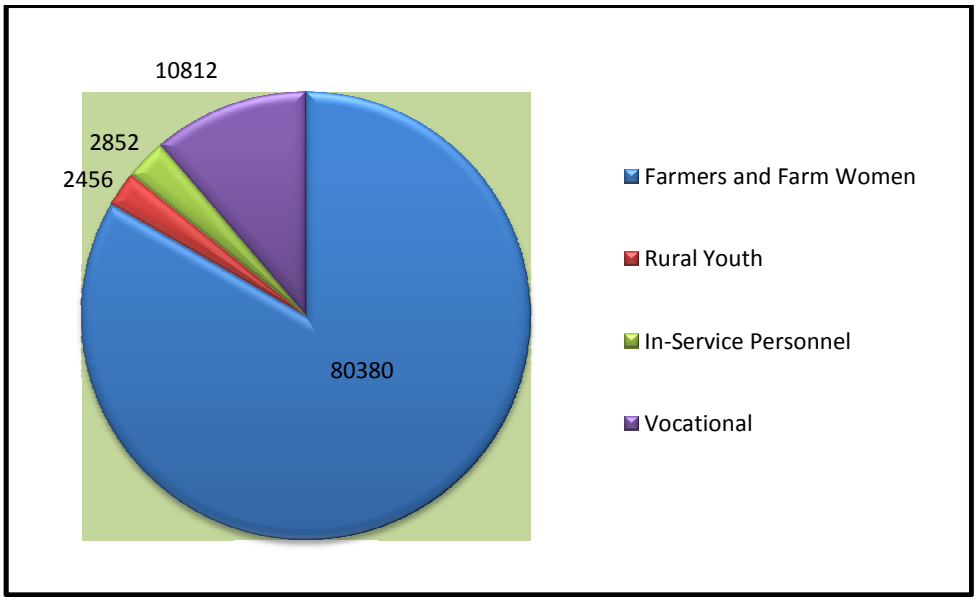


Figure 2. Number of Participants

Table 4.2: Sponsored Training programmes for farmers and farm women by the KVKs in Zone VII during 2013-14

Major Theme	No.	Total		
		Male	Female	Total
Capacity Building	900	41327	1716	43043
Agronomy	322	14441	700	15141
Horticulture	274	4968	772	5740
IPM	179	5809	1299	7108
ICM	67	2194	214	2408
Agril. Engg.	58	2336	595	2931
INM	54	1826	129	1955
Income Generation	22	315	128	443
Livestock	10	303	87	390
Fishries	3	99	19	118
IFS	3	79	0	79
Production of Input at Site	3	94	0	94
Home Science/Women in Agriculture	2	0	61	61
Value Addition	2	0	61	61
Other	9	737	71	808
Total	**1908**	**74528**	**5852**	**80380**

Table 4.3: Sponsored Training programmes for rural youths by the KVKs in Zone VII during 2013-14

Categrory	No.	Total		
		Male	Female	Total
Agronomy	134	710	44	754
Agril. Engg.	103	126	7	133
Horticulture	15	418	110	528
Plant Protection	8	284	24	308
Production of Input at Site	7	153	3	156
Capacity Building	5	102	35	137
Value Addition	5	118	35	153
Livestock	4	108	12	120
Soil Health Management	2	58	2	60
Fishries	1	19	0	19
ICT	1	18	2	20
Other	3	68	0	68
Total	**288**	**2182**	**274**	**2456**

Table 4.4: Sponsored Training programmes for Extension Personnel by the KVKs in Zone VII during 2013-14.

Categrory	No.	Total		
		Male	Female	Total
Agronomy	67	1819	167	1986
Plant Protection	3	476	106	582
Soil Health Management	3	84	4	88
Horticulture	2	79	5	84
Agril.Engg.	1	50	0	50
Other	2	57	5	62
Total	**78**	**2565**	**287**	**2852**

Table 4.5: Details of Vocational training programmes carried out by KVKs for rural youth in Zone VII during 2013-14.

Categrory	No.	Total		
		Male	Female	Total
Small Scale Income Generation	63	34	36	70
CRP	61	391	107	498
Horticulture	53	19	0	19
Value addition	46	293	53	346
PIS	42	104	5	109
Livestock	37	5	0	5
Fishries	18	34	0	34
Home Science	15	940	251	1191
CBD	12	1225	93	1318
AGE	11	14	2	16
SFM	7	1306	842	2148
Fodder production	3	241	330	571
IFS	3	41	0	41
IPM	3	1188	191	1379
Agroforestry	2	144	22	166
Sugercane	2	620	719	1339
Medicinal	1	347	327	674
Storage	1	27	13	40
Other	20	696	152	848
Total	**400**	**7669**	**3143**	**10812**

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 110276 activities were conducted and 11.44 lakh farmers, farm women, rural youth and extension workers were benefited (Table 5).

Table 5.1: Details of extension activities organized by the KVKs of Zone-VII during 2013-14

Activity	No. of activities (Achieved)	Details of participants												
		Farmers/ Others							Extension Personnels			Totals of farmers and Extension Personnels		
		Others		SC/ST		Total								
		M	F	M	F	M	F	T	M	F	T	M	F	T
Agri mobile clinic	230	23268	564	3317	555	26585	1119	27704	2082	1010	3092	28667	2129	30796
Animal Health Camp	195	6763	896	3291	692	30626	1588	32214	320	27	347	30946	1615	32561
Aqua health Camp	1	13				13	0	13	3		3	16	0	16
Awareness programme	1	35	0	4	1	39	1	40			0	39	1	40
Celebration of important days	276	9637	4473	5675	2773	15312	7246	22558	566	196	762	15878	7442	23320
Diagnostic visits	4189	12482	2232	9020	2117	21502	4349	25851	827	148	975	22329	4497	26826
Exhibition	318	96330	20228	38532	12154	134862	32382	167244	3473	772	4245	138335	33154	171489
Exposure visits	358	6720	1027	3323	815	10043	1842	11885	174	35	209	10217	1877	12094
Extension Literature	743	33536	4761	14976	2624	48512	7385	55897	1907	342	2249	50419	7727	58146
Ex-trainees Sammelan	170	3539	604	1482	414	5021	1018	6039	141	36	177	5162	1054	6216
Farm	6314	2964	1861	2808	245	5772	4319	62046	173	339	207	5946	4658	64119

advisory Services		4		3	8	7			4		3	1		
Farm School	2	54	-	1	-	55	0	55	-	-	0	55	0	55
Farm Science Club conveners meet	130	1498	227	484	133	1982	360	2342	78	11	89	2060	371	2431
Farmers Seminar	143	3923	677	2418	772	6341	1449	7790	299	96	395	6640	1545	8185
Farmers visit to KVK	70532	64980	10112	43488	9425	108468	19537	128005	3160	365	3525	111628	19902	131530
Field Day	764	14570	2696	10863	2883	25433	5579	31012	932	195	1127	26365	5774	32139
Film Show	2250	25849	6436	17193	6731	43042	13167	56209	1326	292	1618	44368	13459	57827
Field Diagnostic camp	1	29	0	1	0	30	0	30			0	30	0	30
FIG meeting	2	49	1	10	0	59	1	60			0	59	1	60
Group meetings	1306	8895	3106	7010	3484	15905	6590	22495	1953	150	2103	17858	6740	24598
Interface with scientist	37	555	76	953	180	1508	256	1764	45	19	64	1553	275	1828
Kisan Ghosthi	573	12205	1864	8015	2198	20220	4062	24282	613	95	708	20833	4157	24990
Kisan Mela	137	88454	16491	57816	14472	146270	30963	177233	3916	807	4723	150186	31770	181956
KMA	51	10505	25	2479	0	12984	25	13009	56	3	59	13040	28	13068
Lectures delivered as resource persons	3544	53424	10101	25694	7218	79118	17319	96437	2100	500	2600	81218	17819	99037
Mahila Mandals conveners meetings	154	1092	2065	679	1007	1771	3072	4843	111	82	193	1882	3154	5036
Method Demonstrations	646	4986	1544	4006	1597	8992	3141	12133	511	139	650	9503	3280	12783
Newspaper coverage	1442	2500	0	0	0	2500	0	2500	0		0	2500	0	2500
Popular articles	882	6377	553	3108	636	9485	1189	10674	1457	396	1853	10942	1585	12527
Radio talks	553	0	0	0	0	0	0	0	0	0	0	0	0	0
Scientific visit to farmers field	11998	30374	5439	21117	5439	51491	10878	62369	753	154	907	52244	11032	63276
Seed treatment Campaign	2	47	9	8	0	55	9	64	0	0	0	55	9	64
Self Help Group conveners meetings	338	1256	2291	876	1360	2132	3651	5783	106	101	207	2238	3752	5990
Soil health Camp	106	3203	433	1506	276	4709	709	5418	198	20	218	4907	729	5636
Soil test campaigns	1157	3311	357	2120	341	5431	698	6129	135	16	151	5566	714	6280
Technological Week	6	988	132	2372	558	3360	690	4050	176	16	192	3536	706	4242
TV talks	439	2500	0	0	0	2500	0	2500	0	0	0	2500	0	2500

Video conference	40	5988	22	3015	13	9003	35	9038	2200	12	2212	11203	47	11250
Village Sanitation camp	1	5	0	23	2	28	2	30	1	1	2	29	3	32
Workshop	245	2855	488	2244	469	5099	957	6056	2784	279	3063	7883	1236	9119
Total	**110276**	**572439**	**101791**	**325202**	**83797**	**918213**	**185588**	**1103801**	**34137**	**6654**	**40791**	**952350**	**192242**	**114592**

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

Table 5.2: Details of extension activities organized by the KVKs of Madhya Pradesh during 2013-14

Activity	No. of activities	Details of participants												
		Farmers/ Others							Extension Personnels			Totals of farmers and Extension Personnels		
		Others		SC/ST		Total								
		M	F	M	F	M	F	T	M	F	T	M	F	T
Agri Mobile Clinic	216	23080	507	3085	513	26165	1020	27185	2071	1010	3081	28236	2030	30266
Animal Health Camp	119	4335	287	1379	247	26286	534	26820	194	10	204	26480	544	27024
Celebration of Important Days	144	6836	2884	3459	1251	10295	4135	14430	242	68	310	10537	4203	14740
Diagnostic Visits	1383	6104	593	3268	620	9372	1213	10585	368	48	416	9740	1261	11001
Exhibition	139	79892	14637	27601	7284	107493	21921	129414	2773	520	3293	110266	22441	132707
Exposure Visits	176	3136	477	1059	197	4195	674	4869	50	10	60	4245	684	4929
Extension Literature	342	21844	3386	7849	991	29693	4377	34070	1433	303	1736	31126	4680	35806
Ex-trainees Sammelan	79	2045	281	624	135	2669	416	3085	83	19	102	2752	435	3187
Farm Advisory Services	3456	19778	636	23296	1628	43074	2264	45338	1253	221	1474	44327	2485	46812
Farm School	2	54	-	1	-	55	0	55	-	-	0	55	0	55
Farm Science Club conveners meet	26	158	43	77	15	235	58	293	13	3	16	248	61	309
Farmers Seminar	55	1921	178	1023	271	2944	449	3393	121	45	166	3065	494	3559
Farmers Visit to KVK	38771	48987	7217	28466	5675	77453	12892	90345	2517	257	2774	79970	13149	93119
Field Day	331	6926	840	4008	1045	10934	1885	12819	417	56	473	11351	1941	13292
Film Show	1028	11976	2547	5781	1794	17757	4341	22098	659	128	787	18416	4469	22885
Group Meetings	247	2468	655	1826	529	4294	1184	5478	1569	57	1626	5863	1241	7104
Interface with Scientist	30	152	18	589	110	741	128	869	20	8	28	761	136	897
Kisan Ghosthi	316	9081	1172	5139	1226	14220	2398	16618	442	46	488	14662	2444	17106
Kisan Mela	72	74430	12241	39777	8110	114207	20351	134558	2652	433	3085	116859	20784	137643
KMA	51	10505	25	2479	0	12984	25	13009	56	3	59	13040	28	13068
Lectures Delivered	1930	37800	5369	15449	3593	53249	8962	62211	1308	234	1542	54557	9196	63753

as Resource Persons														
Mahila Mandals Conveners meetings	91	1020	1271	679	432	1699	1703	3402	102	46	148	1801	1749	3550
Method Demonstrations	193	1931	628	924	524	2855	1152	4007	189	48	237	3044	1200	4244
Newspaper Coverage	463	Mass				0	0	0			0	0	0	0
Popular Articles	491	3837	538	3086	621	6923	1159	8082	1451	394	1845	8374	1553	9927
Radio Talks	281	Mass				0	0	0			0	0	0	0
Scientific Visit to Farmers Field	3686	15609	1570	9210	1386	24819	2956	27775	548	93	641	25367	3049	28416
Seed Treatment Campign	1	15	9			15	9	24			0	15	9	24
Self Help Group Conveners Meetings	116	1022	1004	650	289	1672	1293	2965	71	14	85	1743	1307	3050
Soil Health Camp	56	2063	207	949	150	3012	357	3369	128	8	136	3140	365	3505
Soil Test Campaigns	66	1729	162	768	148	2497	310	2807	97	10	107	2594	320	2914
Technology Week	5	845	84	2332	549	3177	633	3810	176	16	192	3353	649	4002
TV Talks	181	Mass				0	0	0			0	0	0	0
Vedio Conference	40	5988	22	3015	13	9003	35	9038	2200	12	2212	11203	47	11250
Village Sanitation Camp	1	5	0	23	2	28	2	30	1	1	2	29	3	32
Workshop	71	1659	251	919	193	2578	444	3022	816	92	908	3394	536	3930
Total	**54655**	**407231**	**59739**	**198790**	**39541**	**626593**	**99280**	**725873**	**24020**	**4213**	**28233**	**650613**	**103493**	**754106**

M=Male, F=Female, T=Total

Table 5.3: Details of extension activities organized by the KVKs of Chhatishgarh during 2013-14

Activity	No. of activities (Achieved)	Details of participants												
		Farmers/ Others							Extension Personnels			Totals of farmers and Extension Personnels		
		Others		SC/ST		Total								
		M	F	M	F	M	F	T	M	F	T	M	F	T
Agri mobile clinic	2	1	0	9	1	10	1	11	0	0	0	10	1	11
Animal Health Camp	21	273	48	366	65	639	113	752	31	5	36	670	118	788
Celebration of important days	28	393	341	619	385	1012	726	1738	61	35	96	1073	761	1834
Diagnostic visits	737	1642	129	2231	221	3873	350	4223	290	48	338	4163	398	4561
Exhibition	97	2195	831	5827	2666	8022	3497	11519	193	83	276	8215	3580	11795
Exposure visits	97	1713	165	1445	355	3158	520	3678	62	16	78	3220	536	3756
Extension Literature	205	2693	35	3638	783	6331	818	7149	279	30	309	6610	848	7458
Ex-trainees Sammelan	46	711	15	380	8	1091	23	1114	18	0	18	1109	23	1132
Farm advisory Services	596	5265	90	2634	96	7899	186	8085	271	35	306	8170	221	8391
Farm Science Club conveners meet	7	46	22	56	35	102	57	159	5	3	8	107	60	167
Farmers Seminar	19	959	224	267	122	1226	346	1572	79	28	107	1305	374	1679
Farmers visit to KVK	10680	7259	787	7944	892	15203	1679	16882	437	91	528	15640	1770	17410
Field Day	113	2686	522	3008	666	5694	1188	6882	197	40	237	5891	1228	7119
Film Show	228	2940	469	3906	886	6846	1355	8201	282	52	334	7128	1407	8535
Group meetings	193	1714	451	1498	570	3212	1021	4233	176	38	214	3388	1059	4447
Kisan Ghosthi	148	1793	411	2184	591	3977	1002	4979	130	37	167	4107	1039	5146
Kisan Mela	25	6072	1375	11523	3022	17595	4397	21992	509	115	624	18104	4512	22616
Lectures delivered as resource persons	890	6820	2181	5902	1306	12722	3487	16209	319	115	434	13041	3602	16643
Mahila Mandals conveners meetings	27	0	141	0	171	0	312	312	2	8	10	2	320	322
Method Demonstrations	140	1197	306	1685	528	2882	834	3716	175	50	225	3057	884	3941
Newspaper coverage	719	Mass												
Popular articles	241													
Radio talks	124	Mass												
Scientific visit to farmers field	1252	1962	168	2460	270	4422	438	4860	127	29	156	4549	467	5016
Self Help Group conveners meetings	64	79	96	166	229	245	325	570	15	4	19	260	329	589
Soil health Camp	11	65	18	137	6	202	24	226	9	1	10	211	25	236
Soil test campaigns	1045	696	64	673	45	1369	109	1478	8	1	9	1377	110	1487
TV talks	41	Mass												

Workshop	108	878	162	1139	188	2017	350	2367	1682	137	1819	3699	487	4186
Total	**17904**	**50052**	**9051**	**59697**	**14107**	**109749**	**23158**	**132907**	**5357**	**1001**	**6358**	**115106**	**24159**	**139265**

M=Male, F=Female, T=Total

Table 5.4: Details of extension activities organized by the KVKs of Odisha during 2013-14

Activity	No. of activities (Achieved)	Details of participants												
		Farmers/ Others							Extension Personnels			Totals of farmers and Extension Personnels		
		Others		SC/ST		Total								
		M	F	M	F	M	F	T	M	F	T	M	F	T
Agri mobile clinic	12	187	57	223	41	410	98	508	11	0	11	421	98	519
Animal Health Camp	55	2155	561	1546	380	3701	941	4642	95	12	107	3796	953	4749
Aqua health Camp	1	13				13	0	13	3		3	16	0	16
Awareness programme	1	35	0	4	1	39	1	40			0	39	1	40
Celebration of important days	104	2408	1248	1597	1137	4005	2385	6390	263	93	356	4268	2478	6746
Diagnostic visits	2069	4736	1510	3521	1276	8257	2786	11043	169	52	221	8426	2838	11264
Exhibition	82	14243	4760	5104	2204	19347	6964	26311	507	169	676	19854	7133	26987
Exposure visits	85	1871	385	819	263	2690	648	3338	62	9	71	2752	657	3409
Extension Literature	196	8999	1340	3489	850	12488	2190	14678	195	9	204	12683	2199	14882
Ex-trainees Sammelan	45	783	308	478	271	1261	579	1840	40	17	57	1301	596	1897
Farm advisory Services	2262	4601	1135	2153	734	6754	1869	8623	210	83	293	6964	1952	8916
Farm Science Club conveners meet	97	1294	162	351	83	1645	245	1890	60	5	65	1705	250	1955
Interface with scientist	7	403	58	364	70	767	128	895	25	11	36	792	139	931
Farmers Seminar	69	1043	275	1128	379	2171	654	2825	99	23	122	2270	677	2947
Farmers visit to KVK	21081	8734	2108	7078	2858	15812	4966	20778	206	17	223	16018	4983	21001
Field Day	320	4958	1334	3847	1172	8805	2506	11311	318	99	417	9123	2605	11728
Field Diagnostic camp	1	29	0	1	0	30	0	30			0	30	0	30
FIG meeting	2	49	1	10	0	59	1	60			0	59	1	60
Film Show	994	10933	3420	7506	4051	18439	7471	25910	385	112	497	18824	7583	26407
Group meetings	866	4713	2000	3686	2385	8399	4385	12784	208	55	263	8607	4440	13047
Kisan Ghosthi	109	1331	281	692	381	2023	662	2685	41	12	53	2064	674	2738
Kisan Mela	40	7952	2875	6516	3340	14468	6215	20683	755	259	1014	15223	6474	21697
Lectures delivered as resource persons	724	8804	2551	4343	2319	13147	4870	18017	473	151	624	13620	5021	18641
Mahila Mandals conveners meetings	36	72	653	0	404	72	1057	1129	7	28	35	79	1085	1164
Method Demonstrations	313	1858	610	1397	545	3255	1155	4410	147	41	188	3402	1196	4598

Newspaper coverage	260	2500	0	0	0	2500	0	2500	0		0	2500	0	2500
Popular articles	150	2540	15	22	15	2562	30	2592	6	2	8	2568	32	2600
Radio talks	148					0	0	0			0	0	0	0
Scientific visit to farmers field	7060	12803	3701	9447	3783	22250	7484	29734	78	32	110	22328	7516	29844
Seed treatment Campion	1	32	0	8	0	40	0	40			0	40	0	40
Self Help Group conveners meetings	158	155	1191	60	842	215	2033	2248	20	83	103	235	2116	2351
Soil health Camp	39	1075	208	420	120	1495	328	1823	61	11	72	1556	339	1895
Soil test campaigns	46	886	131	679	148	1565	279	1844	30	5	35	1595	284	1879
Technological Week	1	143	48	40	9	183	57	240	-	-	0	183	57	240
TV talks	217	2500	0	0	0	2500	0	2500	0	0	0	2500	0	2500
Workshop	66	318	75	186	88	504	163	667	286	50	336	790	213	1003
Total	**37717**	**115156**	**33001**	**66715**	**30149**	**181871**	**63150**	**245021**	**4760**	**1440**	**6200**	**186631**	**64590**	**251221**

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

6. Technology week

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 6.1: Details of technology week organized by the KVKs of Zone-VII during 2013-14

No. of KVK	Types of Activities	No. of Activities	Number of Participants	Related crop/livestock technology
81	Agri-Entrepreneurship meet	1	25	Groundnut, Greengram, Blackgram
	Animal health camp	16	1307	Vaccination of livestock,
	Aqua Health Camp	1	16	Pisciculture
	Awareness	18	1223	Crop production, SRI, Dual purpose poultry rearing, Mushroom cultivation,
	Bio Fertilizer (q)	7	73	Vermi compost
	Bio Product distribution (Kg)	129	359	*Tricoderma, Pseudomonas*
	Celebrationn of special day	179	8743	Parthanium weed management, world environment day etc.
	Demonstration	8	445	ICM, Implements, Livestocks
	Diagnostic Practical's	273	4341	Field crops, vegetables, spices and medicinal crops
	Distribution of fingerlings (No)	2	29500	Comman carp & Magur
	Distribution of lac seed qts	1.85	60	Brood lac
	Distribution of Literature (No.)	1743	23790	Groundnut, soybean, blackgram, pearlmillet, wheat, chickpea, mustard, lentil, tomato, cucurbits etc.
	Distribution of Livestock specimen (No.)	1	35	Bull for breed improvement
	Distribution of Planting materials (No.)	12519	732	Fruit & vegetables
	Distribution of Poultry chicks	0	600	Livestock technology
	Distribution of Seed (q)	210	1042	Soybean, Wheat, Chickpea, Mustard, Coriander
	Distribution of seedlings	1	25	Brinjal, Chilli
	Distribution of vegetable seed	0	50	Vegetable Crops

No. of KVK	Types of Activities	No. of Activities	Number of Participants	Related crop/livestock technology
	Ex- Trainees Meet	12	444	Discuss about latest technology and feedback about adoption of technology
	Exhibition	50	6693	Latest technologies, livestock etc.
	Exposure visit	12	310	Seasonal crops
	Farm Visit	494	9584	Cereals, oilseeds, pulses, vegetables livestocks etc.
	Farmer scientist interaction	17	3046	Agri enterpreneurs
	Farmers Fair	24	29429	other enterprises
	Farmers visited to KVKs	698	28146	Improved Agricultural technology
	Field day	16	519	Crops, livestocks
	Film show	142	5328	fish and IFS's
	Ghosthies	95	4834	Crops,/livestocks
	Group Discussion	16	202	Discuss about latest technology and feedback about adoption of technology
	Health Camp	1	346	INM, IPM, IDM
	Lecture organized	247	5601	Kharif and rabi crop management practices
	literature distribution	1	120	News letter
	Meeting	2	88	Incomegeneration actvity like rearing vanaraj in backyard, rearing improved duckling in backyard pond
	Method demonstration	5	185	Crop management and Farm mechanisation
	Mobile Agri Clinic	1	45	Plant Protection,Horticulture,Fishery
	News Paper	3	0	
	Plant Health Camp	2	166	IPM & INM
	Road show	5	410	
	Seed treatment campaign	4	175	Crops
	Seminar	9	2235	Newly devloped agricultural technologies
	SHG	5	266	
	Soil Health Camp	5	1154	Soil sample collection
	Soil Test Campaign	4	212	Soil testing for soil health management
	Training	98	3948	Agricultural technologies in crops, livestocks & others
	Vermicompost	1	20	Organic farming
	Total	**17078.85**	**175872**	

Table 6.2: Details of technology week organized by the KVks of Chhatishgarh during 2013-14

No. of KVK	Types of Activities	No. of Activities	Number of Participants	Related crop/livestock technology
1	Bio Fertilizer (q)	1	8	Vermi compost
1	Bio Product distribution (Kg)	1	13	*Tricoderma, Pseudomonas*
9	Celebration of special day	161	7814	Parthanium weed management,Crop technology
4	Diagnostic Practical's	207	1032	Cereals, Pulses, Vegetables, Fruit Crops and Other enterprises
1	Distribution of fingerlings (No)	1	15	Comman carp & Magur 5000 Nos.
1	Distribution of lac seed (qts)	1.85	60	Lac technology
5	Distribution of Literature (No.)	453	2454	Crop cultivation, Live stock management, Mushroom, Lac, Vegetables & Plant protection, IKM.
1	Distribution of Planting materials (No.)	1	17	Wilt resistant variety of brinjal
1	Distribution of Poultry chicks (No.)	600	600	Livestock technology
4	Distribution of Seed (q)	18	155	Improved variety of vegetables and Finger millet
1	Distribution of vegetable seed(kg)	295 .30	50	Vegetable technology
5	Exhibition	16	1379	IPM, Fish production, Value addition
4	Farm Visit	397	583	Cereals, Pulses, Vegetables, Fruit Crops and Other enterprises
4	Farmers Fair	8	21189	Crops and Others Enterprises
1	Farmers visited to KVKs	6	142	
5	Film show	27	977	Fishries, Dairy, Mushroom, Goat, Post Harvest Technology
5	Ghosthies	23	1145	Crop cultivation, Live stock management, Mushroom, Lac, Vegetables & Plant protection, IKM.
3	Lecture organized	21	638	Crop production, Fishries, Dairy, Mushroom, Goat, Post Harvest Technology
1	Soil Health Camp	1	954	Agronomy/Soil sample collection through GPS/GIS system
2	Training	13	747	Crop cultivation, Live stock management, Mushroom, Vegetables
	Total	**1956.85**	**39972**	

Table 6.3: Details of technology week organized by the KVks of Madhya Pradesh during 2013-14

No. of KVK	Types of Activities	No. of Activities	Number of Participants	Related crop/livestock technology
4	Animal health camp	6	347	Vaccination & health check etc.
1	Awareness	2	185	Eradication of Parthenium
1	Bio Fertilizer (q)	5	35	Vermicompost
3	Bio Product distribution (Kg)	227	311	BGA
5	Celebration of special day	17	899	Hindi Chetna Saptah, Parthenium DAY, World Environment Day
2	Demonstration	7	245	Intensification of hybrid rice,Deworming in animal,Seed & Soil treatment
14	Diagnostic Practical's	56	3073	Demonstrations of Crops,impliments, tractor mounted sprayes, seed grader etc.
1	Distribution of fingerlings (No)	1	7	24500 fingerlings
13	Distribution of Literature (No.)	763	18767	Package of practices of different crops, vermi compost, LPM etc.
1	Distribution of Livestock specimen (No.)	1	35	
5	Distribution of Planting materials (No.)	14	245	Vegetable and Fruits
5	Distribution of Seed (q)	187	787	Soybean, Wheat, Chickpea, Mustard, Coriander
3	Ex- Trainees Meet	3	199	Latest technologies, farm machinery & equipment
12	Exhibition	24	2579	Implements, Seed samples, Technological Charts, Models etc.
2	Exposure visit	11	302	Technologies of kharif crop - Soybean, Paddy, Maize, Pigeon pea etc.
16	Farm Visit	78	5839	Crop cafeteria/Demonstration Plots/High density Guava Orchard/Vermicompost unit/Azola unit.
7	Farmers Fair	9	5065	Cereals, vegetables & fruit crops , Food Processing, Fruit Preservation and Forest Crops
17	Farmers visited to KVKs	679	19767	Farmers visit of crop cafeteria and seen to different variety of soybean, maize, til, tuar, fodder crop, vegetable , spices and medicinal crop
4	Field day	7	346	Production technology of filed crop, enhancement of fertilizer use efficiency & cropping system.

No. of KVK	Types of Activities	No. of Activities	Number of Participants	Related crop/livestock technology
15	Film show	64	2301	Vemiculture, farm implements, IPM,INM,Micro irrigation
17	Ghosthies	65	3467	Crop production, Live stock production, Woman in Agriculture, Horticulture
16	Lecture organized	175	3399	Kharif –Rabi crop/Gouty and Poultry Management/Fodder production
1	Meeting	1	48	Cultivation of Soybean Production
1	Method demonstration	1	40	Seed treatment
1	News Paper	3	mass	
1	Seminar	1	35	Integrated pest Management in Rabi Crops
1	SHG	1	41	
17	Training	66	2608	IPM,ICM, INM, Seed production, drudgery reduction, water conservation, formation of SHG, ITC etc.
1	Workshop	1	62	
	Total	**2475**	**71034**	

Table 6.4: Details of technology week organized by the KVks of Odisha during 2013-14

No. of KVK	Types of Activities	No. of Activities	Number of Participants	Related crop/livestock technology
1	Agri-Entrepreneurship meet	1	25	Groundnut, Greengram, Blackgram
8	Animal health camp	10	960	Vaccination, Treatment
1	Aqua Health Camp	1	16	Pisciculture
11	Awareness	16	1038	SRI, Dual purpose poultry rearing, Mushroom cultivation,Fishries
1	Bio Fertilizer (q)	1	30	Vermi compost
1	Bio Product distribution (Kg)	100	35	
1	Celebrationn of special day	1	30	Mushroom
1	demonstration	1	200	Maize Sheller, Manual cum electric operated maize Sheller, Small garden tool for farm women.
5	Diagnostic Practical's	10	236	INM & IPM in Cauli flower,cabbage,paddy, etc.,
5	Distribution of Literature (No.)	532	2569	Crop production, Horticulture, Plant protection, Ag. Engineering, Home Science, Fishery
4	Distribution of Planting	12503	270	Mango grafts, papaya seedlings, mushroom spawn

No. of KVK	Types of Activities	No. of Activities	Number of Participants	Related crop/livestock technology
	materials (No.)			
1	Distribution of Seed (q)	5	100	Paddy, Maize, Redgram , blackgram
1	Distribution of seedlings	1	25	Brinjal, Chilli
4	Ex- Trainees Meet	9	245	Crop and livestock
8	Exhibition	10	2735	Crop production, Horticulture, Plant protection, Ag. Engineering, Home Science, Fishery
1	Exposure visit	1	8	Ornamental fish rearing
5	Farm Visit	19	3162	Crop production, Horticulture, Plant protection, Ag. Engineering, Home Science, Fishery
11	Farmer scientist interaction	17	3046	Crop Diversification for sustainable livelihood
6	Farmers Fair	7	3175	Crop production, Horticulture, Plant protection, Ag. Engineering, Home Science, Fishery
5	Farmers visited to KVKs	13	8237	Agricultural technology
2	Field day	9	173	Pig rearing, floriculture unit, planting material production unit, Groundnut area
9	Film show	51	2050	IPM, IDM, SRI Fertilizer Broadcaster, Vermicompost, vegetable growing in Polyhouse, mushroom cultivation
4	Ghosthies	7	222	Awareness on Sweet corn cultivation, Honey bee
3	Group Discussion	16	202	Crop production, Horticulture, Plant protection, Ag. Engineering, Home Science, Fishery
1	Health Camp	1	346	Live stock (Cow, Buffalo, Goat, Sheep, Poultry Bird etc.
9	Lecture organized	103	3474	Crop production, Horticulture, Plant protection, Ag. Engineering, Home Science, Fishery
1	Vermicompost	1	20	Vermicompost & verms
	Total	**13446**	**32629**	

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 33167.076 q of seed and 53.95lakhs 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 and planting material produced by the KVKs in Zone-VII

State	2013-14	
	Seed (q)	Planting Material (No.)
Madhya Pradesh	19255.709	1491959
Chhattisgarh	8502.205	585250
Odisha	5409.162	3318710
Total	**33167.076**	**5395919**

Table 7.2: Status of Seed Production (q) in Zone-VII

Crop Category	Crop	Quantity (qt.)	Value (Rs.)	Provided to no. of Farmers
Cereals	Maize	109.47	229500	5
Cereals	Paddy	7170.095	13046975	4896
Cereals	Wheat	4296.49	7962028	3939
Fiber	Cotton	8	52000	0
Flowers	Marigold	35.649	180770	120
Flowers	Rose plants	200		100
Fodder	Barseam seed	0.3	4500	5
Fodder	Chinese Cabbage	0.4	2000	0
Fodder	Dhanicha	12.8	35915	52
Fodder	Oat	1.1	6240	20
Fruits	Aonla	80	0	2
Fruits	Guava	150	23000	4
Fruits	Jack fruit	25	0	2
Fruits	Lemon	60	0	3
Fruits	Mango	50	20000	5
Fruits	Mango + Litchi Orchard	0	90000	0
Fruits	Papaya	5000	0	1000

Crop Category	Crop	Quantity (qt.)	Value (Rs.)	Provided to no. of Farmers
Intercropping	Pulses + Oilseed	5.15		
Millets	Finger Millet	20	49000	325
Millets	Kodo	6.4	25600	0
Millets	Ragi	3.6	12600	29
Oilseed	Groundnut	23.03	122248.75	24785
Oilseed	Linseed	18.7	86020	50
Oilseed	Mustard	81.15	694218	2954
Oilseed	Niger	11.57	66040	45
Oilseed	Safflower	15	45000	0
Oilseed	Sesame	15.085	120366	134
Oilseed	Soybean	2242.58	9527612.12	1308
Oilseed	Toria	8.48	61220	188
Ornamental Crop	Ornamental (Madhukamni,Chandni,Champa,Rose, Bogainvillea	102	2040	23
Plantation	Bamboo	0	7000	19
Plantation	Clonal Eucalyptus	2500	12500	6
Pulse	Blackgram	58.85	482330	157
Pulse	Chickpea	1934.865	8440819.88	929
Pulse	Greengram	34.53	218800	525
Pulse	Horse gram	2.5	3750	0
Pulse	Lentil	3.6	22666	81
Pulse	Pigeon pea	165.04	936790.96	614
Pulse	Sunhemp	1.2	3360	12
Spices	Chilli	199.69	9145	35
Spices	Fenugreek	16.75	1675	20
Spices	Ginger	0.4	1600	10
Spices	Onion	522.9	16005	62
Spices	Turmeric	611.5	269740	57
Spices	Garlic	6	22750	40
Tuber	Elephant Foot yam	2	10000	0
Tuber	Potato	3436	40695	110
Vegetable	Amaranths	0.04	800	10
Vegetable	Bottle Gourd	4.54	2450	10
Vegetable	Brinjal	676.24	8980	35
Vegetable	Bulk vegetables (Tomato, Brinjal, Onion, Papaya, Potato, Bean, cabbage, capsicum)	1407.225	13126	55

Crop Category	Crop	Quantity (qt.)	Value (Rs.)	Provided to no. of Farmers
Vegetable	Cabbage	52.81	9500	15
Vegetable	Cauliflower	13.28	11402	0
Vegetable	Coriender	10.4	8000	40
Vegetable	Cow Pea	0.1	3000	10
Vegetable	Guar	0	0.7	2500
Vegetable	Okra	337.4	18900	41
Vegetable	Pea	38.79	143190	35
Vegetable	Radish	26.55	665	20
Vegetable	Tomato	1068.02	19872	71
Vegetable	Spinach	143.4	2546	63
Other	Honey	0.18	5400	72
Other	Mushroom	4.227	22620	68
Other	Wheat Straw	136	44200	0
	Total	**33167.076**	**43279171**	**45716**

Table 7.3: Status of Seed Production (q) in Madhya Pradesh

Crop Category	Crop	Quantity (qt.)	Value (Rs.)	Provided to no. of Farmers
Cereals	Maize	39.47	96600	5
Cereals	Paddy	1180.845	3148789.6	1834
Cereals	Wheat	3972.99	7405478	3939
Fiber	Cotton	8	52000	0
Flowers	Marigold	34.789	178110	120
Fodder	Barseam seed	0.3	4500	5
Fodder	Chinese Cabbage	0.4	2000	0
Fodder	Oat	1.1	6240	20
Fruits	Aonla	80.00	0	2
Fruits	Guava	150	0	4
Fruits	Jack fruit	25	0	2
Fruits	Lemon	60	0	3
Fruits	Mango	50	20000	5
Intercropping	Pulses + Oilseed	5.15		
Millets	Kodo	6.4	25600	0
Millets	Ragi	3.6	12600	29
Oilseed	Ground nut	5.43	27272.75	24750
Oilseed	Linseed	18.7	86020	50
Oilseed	Mustard	77.15	692218	2954
Oilseed	Niger	5.92	41440	45
Oilseed	Toria	6.34	61220	188

Crop Category	Crop	Quantity (qt.)	Value (Rs.)	Provided to no. of Farmers
Oilseed	Sesame	5.785	69420	134
Oilseed	Soybean	2102.42	9527612.12	1308
Ornamental Crop	Ornamental (Madhukamni,Chandni,Champa,Rose, Bogainvillea	102	2040	23
Plantation	Bamboo	0	7000	19
Plantation	Clonal Eucalyptus	2500	12500	6
Pulse	Black gram	50.02	451450	112
Pulse	Chickpea	1768.47	8350079.88	909
Pulse	Greengram	30.11	218800	525
Pulse	Lentil	3.6	22666	81
Pulse	Sunhemp	1.2	3360	12
Pulse	Pigeon pea	83.44	739280.96	492
Spices	Chilli	196.5	4360	35
Spices	Onion	522.9	16005	62
Spices	Turmeric Seed	418.5	16740	12
Spices	Fenugreek	16.75	1675	20
Spices	Garlic	6	22750	40
Tuber	Potato	3405.5	27510	60
Vegetable	Amaranths	0.04	800	10
Vegetable	Broccoli	5.5	180	4
Vegetable	Spinach	143.4	2546	63
Vegetable	Bottle Gourd	4.54	2450	10
Vegetable	Cabbage	34.5	345	15
Vegetable	Brinjal	674	6740	35
Vegetable	Coriender	10.4	8000	40
Vegetable	Cow Pea	0.1	3000	10
Vegetable	Guar	0	0.7	2500
Vegetable	Okra	332.3	13800	41
Vegetable	Tomato	1068	19572	58
Vegetable	Radish	26.55	665	20
Vegetable	Pea	11.6	116000	35
	Total	**19255.709**	**31527436**	**40646**

Table 7.4: Status of Seed Production (q) in Chhattisgarh

Crop Category	Crop	Quantity (qt.)	Value (Rs.)	Provided to no. of Farmers
Cereals	Maize	70	132900	0
Cereals	Paddy	2272.02	2547926.4	1412
Cereals	Wheat	318	556550	0
Fruits	Guava Orchard	0	23000	0
Fruits	Mango + Litchi Orchard	0	90000	0

Crop Category	Crop	Quantity (qt.)	Value (Rs.)	Provided to no. of Farmers
Fruits	Papaya	5000	0	1000
Millets	Finger Millet	20	49000	325
Oilseed	Mustard	4	2000	0
Oilseed	Niger	3.9	14000	0
Oilseed	Safflower	15	45000	0
Oilseed	Sesamum	8.6	48000	0
Oilseed	Soybean	140.16	0	0
Ornamental Crop	Marigold	0.86	2660	0
Ornamental Crop	Rose plants	200		100
Other	Wheat Straw	136	44200	0
Pulse	Blackgram	7.03	15880	45
Pulse	Chickpea	166.395	90740	20
Pulse	Greengram	4.42	0	0
Pulse	Horse gram	2.5	3750	0
Pulse	Pigeon pea	35.11	181570	68
Spices	Chilli	3.19	4785	0
Spices	Ginger	0.4	1600	10
Spices	Turmeric	8	40500	10
Tuber	Elephant Foot yam	2	10000	0
Tuber	Potato	18.5	4785	0
Vegetable	Brinjal	2.24	2240	0
Vegetable	Cabbage	18.31	9155	0
Vegetable	Cauliflower	13.28	11402	0
Vegetable	Okra	5.1	5100	0
Vegetable	Pea	27.19	27190	0
	Total	**8502.205**	**3963933**	**2990**

Table 7.5: Status of Seed Production (q) in Odisha

Crop Category	Crop	Quantity (qt.)	Value (Rs.)	Provided to no. of Farmers
Cereals	Paddy	3717.23	7350259	1650
Fodder	Dhanicha	12.8	35915	52
Oilseed	Groundnut	17.6	94976	35
Oilseed	Niger	1.75	10600	0
Oilseed	Sesamum	0.7	2946	0
Oilseed	Toria	2.14	0	0
Pulse	Blackgram	1.8	15000	0
Pulse	Pigeon pea	46.49	15940	54
Spices	Turmeric	185	212500	35
Tuber	Potato	12	8400	50
Vegetable	Bulk vegetables	1407.225	13126	55

Crop Category	Crop	Quantity (qt.)	Value (Rs.)	Provided to no. of Farmers
	(Tomato, Brinjal, Onion, Papaya, Potato, Bean, cabbage, capsicum)			
Vegetable	Tomato	0.02	300	13
Other	Honey	0.18	5400	72
Other	Mushroom	4.227	22620	68
	Total	**5409.162**	**7787982**	**2084**

Table 7.6 Status of Planting Material production (Nos) in Zone-VII

Crop Category	Crop	Quantity (Nos)	Value (Rs.)	Provided to no. of Farmers
Flowers	Chrysanthemum	800	3	4
Flowers	Galladia	2000	400	200
Flowers	Gladiolus	5000	0	0
Flowers	Gudhal	1000	0	10
Flowers	Jasmin	71	568	21
Flowers	Marigold	123479	61711.2	297
Flowers	Tuberose	2000		6
Forest Species	Acacia	155610	99550	816
Forest Species	Amaltash	500	10	16
Forest Species	Australian Teak	1000	5000	15
Forest Species	Babul	10	50	1
Forest Species	Bamboo	8136	34755	159
Forest Species	Chironji	500	7500	15
Forest Species	Eucalyptus	1520	3605	19
Forest Species	Gambhar	170	850	20
Forest Species	Gmelina arborea	500	0	132
Forest Species	Goldon Duranta	5000	5	7
Forest Species	Gulmohar	2000	10	15
Forest Species	Hill broom grass	1050	5250	-
Forest Species	Kachnar	1900	10010	274
Forest Species	Mahogany	55	275	15
Forest Species	Mahua	100	4000	40
Forest Species	Mangium	1578	7890	252
Forest Species	Seasam	2000		6
Forest Species	Sissoo	370	1850	33
Forest Species	W. sirisa	30	150	5
Fruits	Anola	6073	51580	514
Fruits	Bael	2	20	2
Fruits	Banana	778	6023	77

Crop Category	Crop	Quantity (Nos)	Value (Rs.)	Provided to no. of Farmers
Fruits	Ber	41	820	16
Fruits	Custard Apple	652	11520	286
Fruits	Drumstick	8376	31180	653
Fruits	Guava	6094	105273	700
Fruits	Jackfruit	888	2395	147
Fruits	Jamun	1052	10420	257
Fruits	Karonda	5518	23149	215
Fruits	Katahal	500	5000	0
Fruits	Lemon	3185	21500	284
Fruits	Lime	108	2160	22
Fruits	Mango	12145	151493.5	441
Fruits	Papaya	56691	309345	1944
Fruits	Pomegranate	876	33520	76
Medicinal	Alovera	18	360	12
Medicinal	Brahmi	60	300	20
Medicinal	Sandal Wood	78	1560	45
Medicinal	Tulsi	500	5000	250
Oilseed	Coconut	8	80	4
Ornamental Crops	Ashok	1203	1045	63
Ornamental Crops	Croton	65	1300	28
Ornamental Crops	Dracaena	167	1670	62
Ornamental Crops	Ficus	105	1100	35
Ornamental Crops	Harad	17	340	9
Ornamental Crops	Hibiscus	93	930	45
Ornamental Crops	Manokamani	51	510	15
Spices	Chilli	303037	96401	1062
Spices	Fenugreek	27	170	45
Spices	Garlic	16	1600	5
Spices	Ginger	75	11250	5
Spices	Karre Patta	500	5000	250
Spices	Onion	2115905	131244	996
Sugar	Sweet Potato	73750	15436	109
Tuber	Turnip	11	155	19
Vegetable	Beet Root	3	45	2
Vegetable	Bitter Gourd	289	2850	34
Vegetable	Bottle gourd	274	2740	25
Vegetable	Brinjal	246779	116132	1520
Vegetable	Broccoli	26235	37235	72
Vegetable	Cabbage	206096	139848	541
Vegetable	Capsicum	70650	55650	100
Vegetable	Cauliflower	326736	236753	558
Vegetable	Cole crop	2000	800	40
Vegetable	Colour Capsicum	2700	10800	5

Crop Category	Crop	Quantity (Nos)	Value (Rs.)	Provided to no. of Farmers
Vegetable	Cucumber	100	500	12
Vegetable	Green capsicum	4650	9300	13
Vegetable	KnolKhol	754	660	23
Vegetable	Lettuce	9	180	8
Vegetable	Moonga	700	13000	260
Vegetable	Pointed gourd	3000	19600	48
Vegetable	Pumpkin	50	500	10
Vegetable	Solanaceous crop	6025	2410	82
Vegetable	Sponge Gourd	476	2850	39
Vegetable	Tomato	1076514	425090.85	6133
Vegetable	Water melon	200	1000	16
Other	Betel leaves	1500	425	
Other	Different	502000	25000	0
Other	Flemigia	1000	5000	5
Other	Others	1245	7275	470
Other	Sugarbeet	390		9
Other	Vidya	500	30	9
	Total	**5395919**	**2399965.55**	**21125**

Table 7.7: Status of Planting Material production (Nos) in Madhya Pradesh

Crop Category	Crop	Quantity (Nos)	Value (Rs.)	Provided to no. of Farmers
Flowers	Galladia	2000	400	200
Flowers	Gladiolus	5000	0	0
Flowers	Jasmin	71	568	21
Flowers	Marigold	1634	952.2	20
Forest Species	Amaltash	500	10	16
Forest Species	Bamboo	5094	5945	59
Forest Species	Eucalyptus	1500	3505	14
Forest Species	Goldon Duranta	5000	5	7
Forest Species	Gulmohar	1000	10	5
Forest Species	Kachnar	1900	10010	274
Forest Species	Mahua	100	4000	40
Forest Species	Tikoma	500	5	5
Fruits	Aonla	3873	50580	484
Fruits	Bael	2	20	2
Fruits	Banana	100	5000	50
Fruits	Ber	41	820	16
Fruits	Custard Apple	652	11520	286
Fruits	Drum stick	605	12100	270
Fruits	Guava	6094	105273	700

Crop Category	Crop	Quantity (Nos)	Value (Rs.)	Provided to no. of Farmers
Fruits	Jackfruit	888	2395	147
Fruits	Jamun	1032	10320	255
Fruits	Karonda	4518	23149	205
Fruits	Katahal	500	5000	0
Fruits	Lemon	3185	21500	284
Fruits	Lime	108	2160	22
Fruits	Mango	5407	14615	146
Fruits	Papaya	10433	31268	599
Fruits	Pomegranate	876	33520	76
Medicinal	Alovera	18	360	12
Medicinal	Tulsi	500	5000	250
Ornamental Crops	Ashok	1203	1045	63
Ornamental Crops	Croton	65	1300	28
Ornamental Crops	Dracaena	167	1670	62
Ornamental Crops	Ficus	105	1100	35
Ornamental Crops	Harad	17	340	9
Ornamental Crops	Hibiscus	93	930	45
Ornamental Crops	Manokamani	51	510	15
Ornamental Crops	Thuja	236	1360	48
Spices	Fenugreek	27	170	45
Spices	Garlic	16	1600	5
Spices	Ginger	75	11250	5
Spices	Karre Patta	500	5000	250
Spices	Onion	536701	33959	622
Tuber	Turnip	11	155	19
Vegetable	Beet Root	3	45	2
Vegetable	Bitter Gourd	289	2850	34
Vegetable	Bottle Gourd	24	240	15
Vegetable	Cucumber	100	500	12
Vegetable	KnolKhol	754	660	23
Vegetable	Lettuce	9	180	8
Vegetable	Sponge Gourd	476	2850	39
Vegetable	Tomato	384816	66451.85	2724
Vegetable	Water melon	200	1000	16
Other	Different	502000	25000	0
Other	Sugarbeet	390		9
Other	Vidya	500	30	9
	Total	**1491959**	**520206.05**	**8607**

Table 7.8Status of Planting Material production (Nos) in Chhattisgarh

Crop Category	Crop	Quantity (Nos)	Value (Rs.)	Provided to no. of Farmers
Flowers	Chrysanthemum	800	3	4
Flowers	Gudhal	1000	0	10
Flowers	Marigold	13000	3600	54
Forest Species	Acacia	145000	50000	55
Forest Species	Chironji	500	7500	15
Forest Species	Gmelina arborea	500	0	132
Forest Species	Gulmohar	1000	0	10
Forest Species	Seasam	2000		6
Fruits	Anola	2000		6
Fruits	Drum stick	200	0	46
Fruits	karonda	1000	0	10
Fruits	Papaya	3400	57500	624
Spices	Chilli	20550	5300	136
Spices	Onion	10000		40
Sugar	Sweet Potato	8650	3800	83
Vegetable	Bottle gourd	250	2500	10
Vegetable	Brinjal	23800	4330	105
Vegetable	Cabbage	88000	79000	142
Vegetable	Cauliflower	119000	113250	52
Vegetable	Moonga	700	13000	260
Vegetable	Pumpkin	50	500	10
Vegetable	Tomato	143850	123100	229
	Total	**585250**	**463383**	**2039**

Table 7.9 Status of Planting Material production (Nos) in Odisha

Crop Category	Crop	Quantity (Nos)	Value (Rs.)	Provided to no. of Farmers
Flowers	Merigold	108845	57159	223
Flowers	Tuberose	2000		6
Forest Species	Acacia	10610	49550	761
Forest Species	Australian Teak	1000	5000	15
Forest Species	Babul	10	50	1
Forest Species	Bamboo	3042	28810	100
Forest Species	Eucalypt	20	100	5
Forest Species	Gambhar	170	850	20
Forest Species	Hill broom grass	1050	5250	-
Forest Species	Mahogany	55	275	15
Forest Species	Mangium	1578	7890	252
Forest Species	Sissoo	370	1850	33
Forest Species	Teak	4468	31074	73
Forest Species	W. sirisa	30	150	5
Fruits	Amla	200	1000	24
Fruits	Banana	678	1023	27
Fruits	Drumstick	7571	19080	337
Fruits	Jamun	20	100	2
Fruits	Mango	6738	136878.5	295
Fruits	Papaya	42858	220577	721
Medicinal	Brahmi	60	300	20
Medicinal	Sandal Wood	78	1560	45
Oilseed	Coconut	8	80	4
Spices	Chilli	282487	91101	926
Spices	Onion	1564000	97285	334
Sugar	Sweet Potato	65100	11636	26
Vegetable	Brinjal	222979	111802	1415
Vegetable	Broccoli	26235	37235	72
Vegetable	Cabbage	118096	60848	399
Vegetable	Capsicum	70650	55650	100
Vegetable	Cauliflower	207736	123503	506
Vegetable	Cole crop	2000	800	40
Vegetable	Colour Capsicum	2,700	10,800	5
Vegetable	Green capsicum	4,650	9,300	13
Vegetable	Pointed gourd	3000	19600	48
Vegetable	Solanaceous crop	6025	2410	82
Vegetable	Tomato	547848	235539	3180
Other	Betel leaves	1500	425	
Other	Flemigia	1000	5000	5
Other	Others	1245	7275	470
	Total	**3318710**	**1448815.5**	**10605**

Production of Bio-products

Status of bio-agents/bio pesticides/ bio fertilizers production by the KVKs is presented in Table 7.10.

Table 7.10: Production of bio-agents / bio pesticides/ bio fertilizers by KVKs in Zone-VII During 2013-14

Major Group Bio agent/Bio fertilizers/Bio Pesticides	Name of the Product	Qty (in Kg)	Qty (in No.)	Value (Rs.)	Provided to no. of Farmers	Expected area coverage (ha.)	No. of KVKs
Bio Agents	*Esinia foetida*	737.9	1506	205050	355	18.67	18
Bio Fertilizer	Azolla	33	0	920	40	0.063	2
Bio Fertilizer	Vermicompost	46720.07	0	168710	411	18.1	16
Mushroom	Mushroom spawn	738	348	34016	377	0	5
Bio Agents	Trichoderma	1140	0	115000	623	290	3
Bio Agents	Baveria vasiana	40	0	2800	40	16	1
Bio Agents	Phosphorous Solubulizing bacteria	650		65250	231	190	1
Bio Fertilizer	Azolla	87	0	2540	71	0.063	3
Bio Fertilizer	Azotobactor	35	175	3500	100	35	1
Bio Fertilizer	BGA	1000	-	40000	128	100	1
Bio Fertilizer	PSB	1575	3600	155250	781	1090	3
Bio Fertilizer	Pseudomonas florescens	10		2000	3	5	1
Bio Fertilizer	Rhizobium	65	103400	2308000	1725	10440	3
Bio Fertilizer	Vermicompost	275665.07	1031	1166405	628	119.05	31

Table 7.11: Production of bio-agents / bio pesticides/ bio fertilizers by KVKs in Madhya Pradesh during 2013-14

Major Group Bio agent/Bio fertilizers/Bio Pesticides	Name of the Product	Qty (in Kg)	Qty (in No.)	Value (Rs.)	Provided to no. of Farmers	Expected area coverage (ha.)	No. of KVKs
Bio Agents	*Bauveria baissiana*	40		2800	40	16	1
Bio Agents	*Esinia foetida*	350.5	1506	54050	71	17.17	5
Bio Agents	Phosphorous Solubulizing bacteria	650		65250	231	190	1
Bio Agents	*Trichoderma* spp.	1135		113500	621	285	2
Bio Fertilizer	AZOLLA	54	-	1620	31		1
Bio Fertilizer	Azotobactor	35	175	3500	100	35	1
Bio Fertilizer	BGA	1000	-	40000	128	100	1
Bio Fertilizer	Rhizobium	65	103400	2308000	1725	10440	3
Bio Fertilizer	PSB	1575	3600	155250	781	1090	3
Bio Fertilizer	*Pseudomonas florescence*	10		2000	3	5	1
Bio Fertilizer	Vermi compost	208945	1	909695	200	97.8	10

Table 7.12: Production of bio-agents / bio pesticides/ bio fertilizers by KVKs in Chhatishgarh during 2013-14

Major Group Bio agent/Bio fertilizers/Bio Pesticides	Name of the Product	Qty (in Kg)	Qty (in No.)	Value (Rs.)	Provided to no. of Farmers	Expected area coverage (ha.)	No. of KVKs
Bio Agents	*Tricoderma viridi,*	5		1500	2	5	1
Bio Agents	*Esinia foetida*	30		3000	4	1	1
Bio Fertilizer	Vermicompost	20000	1030	88000	17	3.15	5
Mushroom Cutivation unit	Fresh Mushroom	15.1	-	1208	30	-	1
Spawn production unit	Mother/Commercial/pure	136.25	1119	8805	36	0	3

Table 7.13: Production of bio-agents / bio pesticides/ bio fertilizers by KVKs in Odisha during 2013-14

Major Group Bio agent/Bio fertilizers/Bio Pesticides	Name of the Product	Qty (in Kg)	Qty (in No.)	Value (Rs.)	Provided to no. of Farmers	Expected area coverage (ha.)	No. of KVKs
Bio Agents	Earthworm	178.7	0	89200	140	0.25	6
Bio Fertilizer	Azolla	33	0	920	40	0.063	2
Bio Fertilizer	Vermicompost	46720.07	0	168710	411	18.1	16
Mushroom	Mushroom spawn	738	348	34016	377	0	5

Production of Livestock materials

Status of Livestock Production production by the KVKs of Zone VII is presented in Table 7.13.

Table 7.14: Status of Livestock Production in KVKs under Zone-VII during 2013-14

Name of the animal / bird / aquatics	Breed	Type of Produce	Qty. (kg/qt./litre)	Value (Rs.)	No. of Beneficiaries	No. of KVKs
Cattle	Cross	Milk(Lit.)	23305	615361	57	2
Cow	Sahiwal	Milk(Lit.)	4892.55	107636.1	25	1
Cow	Red Sindhi cross Jersey	Milk(Lit.)	2702	54040	120	1
Buffalo	Murrha	Milk(Lit.)	5997.15	143931.6	25	1
Poultry	Rainbow rooster, Banraja & Kadaknath	21 to 90 days old chiks(Nos.)	39627	1496810	1740	17
Poultry	Rainbow Rooster	Bird (Kg)	60	7200	10	1
Duck	Khaki campbell	Ducklings (Nos.)	300	12300	30	2
Fish	Catla, Rohu (Jayanti Rohu), Silver carp and Mrigal	Fingerling(No.)	236500	157200	147	3

Name of the animal / bird / aquatics	Breed	Type of Produce	Qty. (kg/qt./litre)	Value (Rs.)	No. of Beneficiaries	No. of KVKs
Fish	Catla, Rohu (Jayanti Rohu), Silver carp and Mrigal	Adult Fish(Kg)	440.5	46500	307	7
Fish	MIC	Fingerlings (Nos.)	630000	78000	47	2
Fish	MIC	Spwan(Nos.)	9000000	62500	54	4
Fish	MIC	Yearlings(Nos.)	67584	64730	27	2
Fish	Indian major carp	Adult Fish	21.9	1314	33	1
Fish	Ornamental Fish	Spwan(Nos.)	801	3824	43	2
Fish	Tilapia	Yearlings(Nos.)	10000	10000	5	1
Mushroom spawn	Paddy straw & oyster	Spawn (Btl.)	200	2400	13	1
Rabbit	Angora	Rabbit, kitten(Nos.)	8	1000/-	6	1
Prawn	Scampi	Table Prawn	12400	2480	12	1

Table 7.15: Status of Livestock Production in KVKs under Madhya Pradesh during 2013-14

Name of the animal / bird / aquatics	Breed	Type of Produce	Qty. (kg/qt./litre)	Value (Rs.)	No. of Beneficiaries	No. of KVKs
Cow	Cross	Milk	9435	2,68,611	57	1
Cow	Sahiwal	Milk	4892.55	107636.1	25	1
Buffalo	Murrha	Milk	5997.15	143931.6	25	1
Poultry	Kadaknath	Birds/ chicks	15192	8,01,166	198	1

Table 7.16: Status of Livestock Production in KVKs under Chhatishgarh during 2013-14

Name of the animal / bird / aquatics	Breed	Type of Produce	Qty. (kg/qt./ litre)	Value (Rs.)	No. of Beneficiaries	No. of KVKs
Cow	Cross	Milk	13870	346750	0	1
Poultry	Vanraja, RIR	Chicks	600	15000	12	1
Fish	Catla, Rohu, Mrigal, Silver carp	Fingerlings	226000	115200	91	1
Fish	Catla, Rohu, Mrigal, Silver carp	Adult Fish (Kg)	242	35450	39	4

Table 7.17: Status of Livestock Production in KVKs under Odisha during 2013-14

Name of the animal / bird / aquatics	Breed	Type of Produce	Qty. (kg/qt./litre)	Value (Rs.)	No. of Beneficiaries	No. of KVKs
Cow	Red Sindhi cross Jersey	Milk(Lit.)	2702	54040	120	1
Poultry	Rainbow rooster & Banraja	21 to 90 days old chiks(Nos.)	23835	680644	1530	15
Poultry	Rainbow Rooster	Bird (Kg)	60	7200	10	1
Duck	Khaki campbell	Ducklings (Nos.)	300	12300	30	2
Fish	Catla, Rohu (Jayanti Rohu), Silver carp and	Fingerling(No.)	10500	42000	26	2

Name of the animal / bird / aquatics	Breed	Type of Produce	Qty. (kg/qt./litre)	Value (Rs.)	No. of Beneficiaries	No. of KVKs
	Mrigal					
Fish	Catla, Rohu (Jayanti Rohu), Silver carp and Mrigal	Table fish (Kg.)	198.5	11050	268	3
Fish	MIC	Fingerling(No.)	630000	78000	47	2
Fish	MIC	Spwan(Nos.)	9000000	62500	54	4
Fish	MIC	Yearlings(Nos.)	67584	64730	27	2
Fish	Indian major carp	Adult Fish(Kg.)	21.9	1314	33	1
Fish	Ornamental Fish	Spwan(Nos.)	801	3824	43	2
Fish	Tilapia	Yearlings(Nos.)	10000	10000	5	1
Mushroom spawn	Paddy straw & oyster	spawn	200 btl	2400	13	1
Rabbit	Angora	Rabbit, kitten	8	1000/-	6	1
Prawn	Scampi	Table Prawn	12400	2480	12	1

8. 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 46,054 soil samples and 1,056 water samples though which more than 47 thousand farmers of 2064 villages were benefitted (Table 8.1). The highest numbers of samples were tested in the state of Madhya Pradesh followed by Odisha and Chhattisgarh.

Table 8.1: Summary of soil and water samples tested by the KVKs in Zone-VII during 2013-14

State	Details	No. of Samples	No. of Farmers	No. of Villages covered
Madhya Pradesh	Soil samples	33149	32272	1008
	Water samples	19	19	17
Chhattisgarh	Soil samples	2095	1951	205
Odisha	Soil samples	10810	9021	622
	Water samples	1037	1013	212
Zone-VII	**Soil samples**	46054	43244	1835
	Water samples	1056	1032	229
	Total	**47110**	**44276**	**2064**

9. Scientific Advisory Committee meetings

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 further 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 139 SAC meetings conducted are presented in Table 9. Out of 100 functional KVKs, 92 KVKs have conducted their SAC.

Table 9: Status of SAC conducted by KVKs during 2013-14

State	No. of KVKs	No. of SACs
Chhattisgarh	20	15
Madhya Pradesh	47	90
Odisha	33	34
Zone VII	**100**	**139**

10.Technological backstopping through technical literatures and media

10.1 Newsletter

Status of Newsletter published by the KVKs during 2013-14 are presented in Table 9.1

Table 10.1: State wise Newsletter published by the KVKs during 2013-14

State	No. of issues	No. of Copies printed	No. of copies distributed
Madhya Pradesh	4	117500	115243
Chhattisgarh	4	45100	43891
Odisha	4	42400	36880
Zone-VII		**205000**	**196014**

10.2. Publications

Status of literature and print media published by the KVKs during 2013-14 are presented in

Table 10.2: Category wise literature and print media published by the KVKs of Zone VII during 2013-14

Category	No. of KVKs	Number
Research Paper	2	16500
Technical bulletins	25	91695
Technical reports	4	153
Other reports		
Abstracts	1	3000
Popular Articles	9	19927
Pumphlet (No. of Copies)	8	66500
Leaflets/Folder (No. of Copies)	27	156156
Book/Booklet (No. of Copies)	33	66875
Extension Literature	5	25200
Folder (No. of copies)	35	163160
News paper Coverage	2	36
Newsletter	3	10000
Technical Booklet	1	32750
Training Material	4	2235
Year Planner	3	600
DVDs (No. of Copies)	33	2190
Other (Diary, Pocket Bulletin)	10	8550
Total		**665527**

11. Details on HRD activities

Table 11.1: HRD activities organized by Zonal Project Directorate in collaboration with ICAR Institute in identified areas for KVK staff during 2013-14

Training Topic	Date	Venue	No. of Participants	Collaborating Institute
Review-cum Action Plan Workshop on Farm Mechanization	April 22-23, 2013	CIAE, Bhopal, M.P.	38	Central Institute of Agril Engineering, Bhopal
Brainstorming Session on Methodological issues in Extension Researches: Way Forward	April 26, 2013	ZPD, Zone VII, Jabalpur	98	ZPD, Zone VII, Jabalpur
Review-cum Action Plan Workshop in Fishery Technology	May 1-2, 2013	CIFA, Bhubaneswar	52	Central Institute of Freshwater Aquaculture, Bhubaneswar
Training- cum-Workshop for Home Science and Horticulture Specialists	May 3-4, 2013	OUAT, Bhubaneswar	65	Odisha University of Agricultural Technology
Training- cum-Workshop on Soil Fertility Management	May 3-4, 2013	IISS, Bhopal	54	Indian Institute of Soil Science, Bhopal
Training – cum-Workshop on Soybean	May 9, 2013	DSR, Indore	48	Directorate of Soybean Research, Indore
Training-cum-workshop on Rice Production Technology	May 14-15, 2013	CRRI, Cuttack	45	Central Rice Research Institute, Cuttack
Planning Workshop for Tribal Sub Plan and Specialized KVKs at KVK Kanker	July 9-10 2013	KVK Kanker, Chhattisgarh	52	
Training-cum-workshop for Animal Science Specialists in KVK at ZPD Zone VII	July 26-27, 2013	ZPD, Zone VII, Jabalpur	55	ZPD, Zone VII, Jabalpur
Training of Computer for Programme Assistant(Computer) of KVKs of M.P.	August, 23, 2013	ZPD, Zone VII, Jabalpur	47	ZPD, Zone VII, Jabalpur
KVK interface on Farm Mechanization	October, 8-9, 2013	ZPD, Zone VII, Jabalpur	26	ZPD, Zone VII, Jabalpur
Review Workshop of TSP, NICRA and KVK-ATMA Convergence Model	January, 29-30,2014	ZPD, Zone VII, Jabalpur	46	ZPD, Zone VII, Jabalpur
Total			**626**	

Table 11.2 KVK Visit/Workshop/Training/Symposium attended by the ZPD Staff/Scientist

S. No.	Particulars	No. of Programmes
1	Training	01
2	Workshop	03
3	Conference	04
4	Seminar	03
5	KVK Visit	82
6	Any other (Review Workshop/Training conducted)	26
Total		**119**

Table 11.4: Footfall of farmers in KVKs of Zone VII

State	No. of KVKs	Footfall during 2013-14		
		No. of Farmers	No. of officials	No. of VIPs
MP	44	98650	4859	452
CG	20	38385	4197	649
Odisha	33	29320	2586	264
Zone-VII	**97**	**166355**	**11642**	**1365**

12. Awards and Recognitions

Zonal Best KVK Award:

KVK Kanker has been awarded "Best Krishi Vigyan Kendra Award 2012" (Zone VII) by ICAR for their outstanding contribution in quality seed production of major agricultural crops, zero tillage, produced organic manure at village level, introduced root crops, rain water harvesting structures, mushroom production technology. To ensure livelihood security of the farmers, KVK established community Piggery, goat rearing unit, integrated mixed farming system and women's empowerment through backyard poultry and household nutritional garden, employment generation through transportation and marketing of vegetable produce, rainwater diversification for drought alleviation and crop diversification.

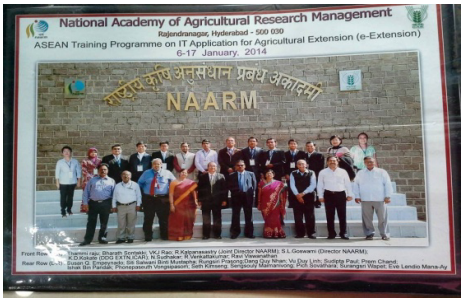
Jagjivan Ram Abhinav Kisan Puraskar

Sri Dolamani Sahu received the Award from Dr. Sharad Pawar, Hon'ble Agriculture Minister, Govt. of India on 16.07.2013 on the occasion of 85th Foundation day of ICAR.

Best Extension Scientist Award

Sri. Manoranjan Mohapatra, PC,KVK, Nuapada, Odisha was felicitated as best Extension Scientist award by His Excellency Governor of Odisha Sj. S.C. Jamir for his outstanding performance for the cause of farming community of Nuapada district.

International Exposure



Dr. Prem Chand, Scientist (Agril Econ) attended ASEAN Training Programme on "IT application for Agricultural Extension (e-Extension) at National Academy of Agricultural Research Management, Hyderabad during 06-17 January, 2014.

Best Poster Paper Award


National Seminar on
Climate Change and Indian Horticulture
Exploring Adaptation and Mitigation Strategies for Expeditious Resilience
25 – 27 May, 2013, Sabour, Bhagalpur, Bihar
Best Poster Paper Award
Presented to
S.R.K. Singh
for the paper entitled
Management options for adaptation and mitigation-feasible regional and farm-based measures
authored by S.R.K. Singh, Anupam Mishra, U.S. Gautam, A.P. Dwivedi and D. Kothari
presented in poster session Theme VII during National Seminar on Climate Change and Indian Horticulture held from 25 – 27 May, 2013 at Sabour, Bhagalpur, Bihar.
(M.L. Choudhary) Vice Chancellor BAU, Sabour
Chairman Poster Session Committee
(V.B. Patel) Organizing Secretary and Chairman (Horticulture)

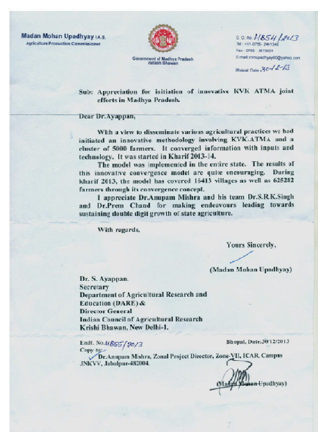
Dr. S.R.K. Singh, Sr. Scientist (AE) and his team, Zonal Project Directorate, Zone-VII, Jabalpur was conferred Best Poster Paper Award during National Seminar on **Climate Change and Indian Horticulture- Exploring Adaptation and Mitigation Strategies for Expeditious Resilience** organized by the Bihar Horticulture Society and Bihar Agriculture University, Sabour in recognition of his appreciable work done in the field of Climate Resilience Agriculture held during May, 25-27, 2013, at Sabour, Bhagalpur, Bihar.

Best Poster Presentation Award


National Seminar
On
PROTECTED CULTIVATION OF HORTICULTURAL CROPS AND VALUE ADDITION
29th - 30th November 2013
DEPARTMENT OF HORTICULTURE
ALLAHABAD SCHOOL OF AGRICULTURE
Sam Higginbottom Institute of Agriculture, Technology & Sciences
Certificate of Excellence
This is to certify that Dr./Mr./Ms. K. P. Singh, P. K. Jain, Prem Chand & R. Nair
from KVK - Banasthali University, Tonk - Rajasthan
has secured 1st position in poster session.
Theme: Conservation & Management of Genetic Diversity for Protected Cultivation
Prof. (Dr.) Gautam Ghosh Convener & Dean Allahabad School of Agriculture
Dr. Devi Singh Organizing Secretary

Dr. Prem Chand, Scientist (Agril. Econ.) attended Best Poster presentation award during National Seminar on **Protected Cultivation of Horticultural Crops and value addition**, 29-30 November, 2013 at department of Horticulture, Allahabad School of Agriculture, Allahabad, U.P.

Appreciation Letter


Madan Mohan Upadhyay I.A.S.
Agriculture Production Commissioner

Government of Madhya Pradesh
Vallabh Bhawan

D.O. No. 4854/2013
Tel : +91-0755- 2441348
Fax : 0755 - 2573031
E-mail: mmupadhyay60@yahoo.com
Bhopal Date 30-12-13

Sub: Appreciation for initiation of innovative KVK ATMA joint efforts in Madhya Pradesh.

Dear Dr.Ayappan,

With a view to disseminate various agricultural practices we had initiated an innovative methodology involving KVK-ATMA and a cluster of 5000 farmers. It converged information with inputs and technology. It was started in Kharif 2013-14.

The model was implemented in the entire state. The results of this innovative convergence model are quite encouraging. During kharif 2013, the model has covered 16413 villages as well as 625282 farmers through its convergence concept.

I appreciate Dr.Anupam Mishra and his team Dr.S.R.K.Singh and Dr.Prem Chand for making endeavours leading towards sustaining double digit growth of state agriculture.

With regards,

Yours Sincerely,

(Madan Mohan Upadhyay)

Dr. S. Ayappan.
Secretary
Department of Agricultural Research and Education (DARE) &
Director General
Indian Council of Agricultural Research
Krishi Bhawan, New Delhi-1.

Endt. No. 4855/2013 Bhopal, Date:30/12/2013
Copy to:-
Dr.Anupam Mishra, Zonal Project Director, Zone-VII, ICAR, Campus JNKVV, Jabalpur-482004.

(Madan Mohan Upadhyay)

Appreciation from Additional Secretary and Agricultural Production Commissioner, Government of Madhya Pradesh for excellent achievements of special Kharif Programme on KVK-ATMA Joint efforts for sustaining double digit growth in Madhya Pradesh.

13. 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 Mobile phone* 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 are key players 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 to the farmers. KVKs implemented the programme and during 2013-14, total 44915 text messages were sent which benefitted to 1198622 users by the operational KVKs in the Zone

Table 13.1: Details of KMA during 2013-14in KVKs of Zone VII

State	No. of KVK	No. of Messages	No. of Farmers	No. of Extension Personnel	Total Beneficiary
M.P.	45	3451	897875	29398	927273
CG	20	1413	144308	9701	154009
Odisha	29	40051	115111	2229	117340
Zone VII	94	44915	1157294	41328	1198622

2. Climate Resilience Agriculture through KVKs under NICRA

NICRA is operational in 14 KVKs in states of Madhya Pradesh, Chhattisgarh & Odisha in Zone VII. Zonal Project Directorate, Zone VII monitor the performance of NICRA KVKs namely Balaghat, Chhattarpur, Datia, Guna, Morena, Satna, Tikamgarh in Madhya Pradesh, Bhatapara, Bilaspur, Dantewada in Chhattisgarh, Kendrapara, Ganjam, Jharsuguda, Sonepur in Odisha. These KVKs are conducting the field activities as per their approved action plan.

- During 2013-14, under **Natural Resource Management module,** a total of 10160 farmers benefited covering area of the 4352.9 ha area in all activities. 8 old farm ponds and 17 drainage channels were renovated to avoid flooding. 16 new check dam were constructed, 959 farmers are benefited through In-situ moisture conservation practices and covering 753.02 ha area. STV based fertilizers applications were followed by 3897 farmers , 666 farmers used Zero tillage technology for saving residual moisture etc.
- **In Crop Production module**, a total of 7087 demonstrations were conducted on 2479.76 ha. area focused on drought tolerant varieties , advancement of planting dates of rabi crops to escape terminal heat stress, etc on chickpea, wheat, barley, moong, arhar and vegetable crops.
- **In Livestock and Fisheries module**, 7889 farmers benefited covering the 29935 Units during the year 2013-14. Out of 29935 Unit, 4029 animals were vaccinated to boost immunity through prevention and, 2270 animals were de-wormed, health check-up of 3094 animals was done and 497 animals were covered under breed upgradation.

- **In Institutional interventions module**, 4557 farmers benefited covering 2031.46 ha area in year 2013-14. Out of 4557 farmers, 2357 farmers benefited through Custom hiring service, 460 farmers by community nursery and 434 farmers through community irrigation covering the area of 1624.31 ha through CHC, 41.5 ha community nursery and 123.7 ha Community irrigation.
- A total of 8705 farmers benefited through capacity building which comprised 6770 male and 1961 female through 398 courses.
- In order to create awareness among the farmers in region, various extension activities were organized by KVK at the farms and the farmer's fields. A total of 10760 farmers benefited of which 1291 farmers through Field day, 1770 farmers by group discussion and 700 farmers benefited through Exposure Visit during the year.
- The testimony of the success of NICRA activities is the number of visitors including dignitaries to the custom hiring centers at NICRA village also wide publicity by the print and electronic media as well as through ICAR website and CRIDA newsletter.

3. Technological Demonstration for Harnessing Pulse Productivity

This programme addressed application of selected technologies related to five major pulse crops viz. chickpea, pigeon pea, green gram, black gram 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. In of Madhya Pradesh, Chattishgarh and Odisha state, 52 KVKs have conducted demonstration on the field of 775 farmers in area of 402.5 ha in Kharif-2013. The promising varieties of pulse crops like pigeon pea (JKM-189, TUT-501, ICPH-2671, Shekhar-2), black gram (PU-35, JU-3, JU-86) were taken for demonstration. During the Rabi 2013-14, in Madhya Pradesh, Chattishgarh and Odisha, 64 KVKs have identified 1055 farmers for demonstration on an area of 650.4 ha. Out of 1055 demonstrations 736 were conducted in Chickpea, 225 in Lentil, 72 in Green gram and 22 in Black gram respectively. The important pulse crops like Chickpea (JG-16, JG-11), Lentil (JL-3), Black gram, and Green gram were taken for demonstration.

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'. TSP is operational in 10 KVKs located in the tribal region of the M.P. and Chhattisgarh. 212 demonstrations were conducted in different pulse crops during the Kharif 2013 with an area of 85 ha with Black gram (PU-35, JU-3, JU-86) and Pigeon pea (JKM-189, TUT-501) varieties. During the Rabi 2013-14 the selected KVKs have conducted demonstration with 1040 farmers on an area of 416 ha. Varieties like JG-11, JG-16 of Chickpea and JL-3 of Lentil are being demonstrated for enhanced production of pulses. KVKs have organized Field Days for enhanced production of pulses.

Regarding the average demonstrated yield of important crops like gram was ranged from 10.3 to 19.76 qt.ha^{-1} to in demonstrated yield whereas, the average yield of framers' practices was ranged between 6.40 to 14.21 qt.ha^{-1} . In case of pegionpea, the average demonstrated yield was reported with range of 8.75 to 17.04 qt.ha^{-1} while, in farmers' practices the range of average yield was found between 8.05 to 14.90 qt.ha^{1}. The average yield of lentil demonstrations was reported with ranged between 6.00 to 13.30 qt.ha^{-1} against the farmer practices which was ranged from 3.50 to 11.75 qt.ha^{-1}. As per concern of fieldpea, the average yield of demonstration plots was recorded in range between 10.80 to 17.04 qt.ha^{-1} against the farmers' practices which was 8.77 to 15.02 qt.ha^{-1}. The average demonstrated yield of blackgram was recorded in range between 5.10 to 10.75 qt.ha^{-1} against the farmers' practice which was 3.65 to 8.78 qt.ha^{-1}. In case of horsegram, the average yield was 5.75 qt.ha^{-1} in demonstration plots against the farmers' practices which was reported 5.17 qt.ha^{-1}.

Farmers Training

FLD on Gram variety JG 130

Seed treatment

Gram + Coriander

5. ISOPOM on Maize-

In an effort to enhance the production and productivity of Maize under ISOPOM 240 demonstrations spread out in 240 acres of area were conducted. The new HYV and hybrids of maize like HQPM-1, Proagro4640, Scorpio, Hycel were demonstrated on farmers' field by six KVKs. During the Kharif 2013 with the average demonstrated yield 35.19 qt. ha^{-1} against the average productivity of the zone i.e. 20.91 qt. ha^{-1} . During the Rabi 2012-13, the demonstration on HYV and Hybrids of maize were undertaken with varieties: HQPM-1, Proagro6212, Hybrid-8255, P-3501, JM-216, Hycel, etc. Ten KVKs were conducted the demonstration in area of 300 acre with 300 numbers of demonstrations at farmers field. The average demonstrated yield of the above programme was 52.1 qt. ha^{-1} against the average productivity in Zone i. e. 41.23 qt. ha^{-1} in Rabi season.

6. DAHD Project

Externally funded Project

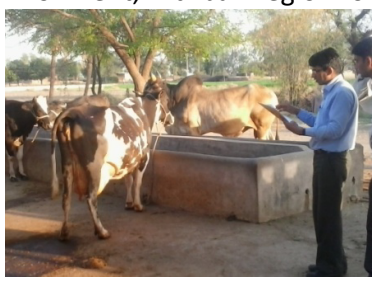
Title: Costs and Returns in Milk Production: Developing Standardized Methodology and Estimates for Various Production Systems

PI: Dr. Prem Chand, Scientist (Agricultural economics)

Funded by: Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India, New Delhi

Lead Centre: Dairy Economics, Statistics & Management Division, Dairy Economics, Statistics & Management Division, National Dairy Research Institute, Karnal, Haryana

The Department of Animal Husbandry, Dairying and Fisheries has sanctioned a two-year project on **"Costs and Returns in Milk Production: Developing Standardized Methodology and Estimates for Various Production Systems"** in Consortium mode, with Zonal Project Directorate, Zone-VII, Jabalpur as a consortia partner and NDRI as the Consortium Leader. This centre assigned to look after the two different production environments viz. Transient and under developed. Udder transient environment, Malwa region of Madhya Pradesh was selected while for underdeveloped production environment, tribal region of Chhattisgarh was selected. From the tribal region, two districts namely Surguja and Korea have been selected while from Malwa region, Ratlam and Indore districts have been selected as per the methodology decided by the sponsoring agency.



Data collection has been completed from 600 sample households (300 from each belt) during 2013-14 9 (November, 2012 to October, 2013) covering three seasons viz. summer, rainy and winter. The data has been entered in the software "MILKECAP" developed under the project. The project has been extended upto June, 2014.

7. PPV & FRA Awearness

India is predominating agriculture and 12th mega biodiversity hot spot in the world. The farmers are playing major role to conservation of biodiversity in the country. There is a need for **develop an effective system for empowered the farmers for their right for proteting the** plant varieties in different part of the country. Looking the importance of the above programmes, the Zonal Project Directorate, Zone-VII, ICAR, Jabalpur and PPV & FRA, New Delhi jointly launched the programme for creation of awareness among the farmer's and other stakeholders about the provision of Protection of Plant Varieties & Farmer's Right Act, 2001 in 20 KVKs of M.P., Chhattisgarh and Odisha and 01 at ZPD level for Programme Co-ordinators of KVKs under Zone-VII. Since the Zone-VII having 5 biodiversity hot spot of the country covering 41 KVKs in the district out of 100 KVKs of zone-VII .

Methodology/ Action Plan/ Road Map:-

Zonal Project Directorate, Zone-VII, ICAR, Jabalpur and PPV & FRA, New Delhi jointly effort to identify the district for the creation of awareness among the farmer's and other stake holders about the provision of Protection of Plant Varieties & Farmer's Right Act, 2001 in 05 hot spot in the Zone viz. 02 M.P. namely Malwa Plateau & Central highland, Bundelkhand and 01 in C.G. namely Bastar and 02 in Odisha namely Chota Nagpur and Koraput .

Bio-diversity hot spots in Zone-VII and PPV & FRA Programme:-

S. No.	Biodiversity	District	Programme conducted under PPV & FRA	No. of Crop & varieties applied for registration under PPV & FRA
1.	Chotanagpur	Mayurbhanj, Sundargarh		
2.	Bastar	*Bastar, Bilaspur, Durg, Jashpur, Kabirdham, *Kanker, Korba, Korea, Mahasamund, Kondagaon,	*Bastar *Rajnandgaon *Kanker	No. of crop - **07** No. of varieties - **30**

S. No.	Biodiversity	District	Programme conducted under PPV & FRA	No. of Crop & varieties applied for registration under PPV & FRA
		*Rajnandgaon		
3.	Koraput	*Koraput, Malkangiri, Sonepur, Jajpur, Nabarangpur, *Kalahandi, Bolangir, Rayagada	*Koraput *Kalahandi	No. of crop – **01** No. of varieties - **29**
4.	Bundelkhand	Damoh, Datia, Panna, Sagar, Tikamgarh, Chattarpur		
5.	Malwa Plateu & Central High lands	Shahdol, Raisen, Bhopal, Sehore, Shajapur, Indore, Ujjain, *Mandsaur, Rajgarh, Hoshangabad, Narsinghpur, *Jabalpur, Mandla, Umaria	*Mandsaur *Jabalpur	No. of crop – **03** No. of varieties - **08**
	05	**41**	**07**	

***KVKs conducted the Training-cum-Awareness Programme under PPV&FRA.**

Outcome of the programme:-

The programme outcome are 203 farmer's planting materials including 96 in Cereals, 33 in Vegetable, Fruits and Spices, 13 in Oilseeds, 43 in pulses and 18 in Millets applied for registration in PPV & FRA .

Classification of participants attended the programme.

KVK Name	No. of farmers	No. of Scientists	No. of State Govt. Officers/Officials	No. of NGO Persons and other participants
JNKVV, Jabalpur				
Dindori	110	03	03	04
Harda	193	03	07	12
Jabalpur	85	15	6	14
Satna (NGO)	169	04	34	03

KVK Name	No. of farmers	No. of Scientists	No. of State Govt. Officers/Officials	No. of NGO Persons and other participants
RVSKVV, Gwalior				
Dhar	105	09	40	03
Mandsaur	152	15	35	-
Jhabua	118	12	20	13
DES, Gwalior	107	41	20	37
IGKV, Raipur				
Raipur	251	124	10	33
Balrampur	100	09	07	02
Bastar	163	25	15	05
Kanker	110	9	7	5
Rajnandgaon	253	124	7	34
Surguja	100	8	1	10
Dantewada	100	07	03	02
OUAT, Bhubaneswar				
Dean, OUAT	82	32	6	18
Kalahandi	80	06	11	03
Sambalpur	86	9	5	10
Cuttack (ICAR)	83	10	01	6
Koraput	100	11	3	3
ZPD, Jabalpur	**55**	**33**	**23**	**-**
Zone-VII	**2602**	**509**	**264**	**217**

Future Strategy:-

1. Awareness of large number of farmers about registration of planting material under PPV & FRA Act.
2. Training of KVKs Scientist about PPV & FRA.
3. Training of ZPD Scientist abroad under PPV & FRA.
4. Increase the number of DUS testing Centre in each hot spot.
5. Increase the number of crop, varieties, medicinal plants, economic value plants for registration under PPV & FRA.
6. Training programme of farmers, NGO and other stakeholder who are directly involved in the PPV & FRA programme for sustain the programmes .

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. Farmer to Farmer Extension:

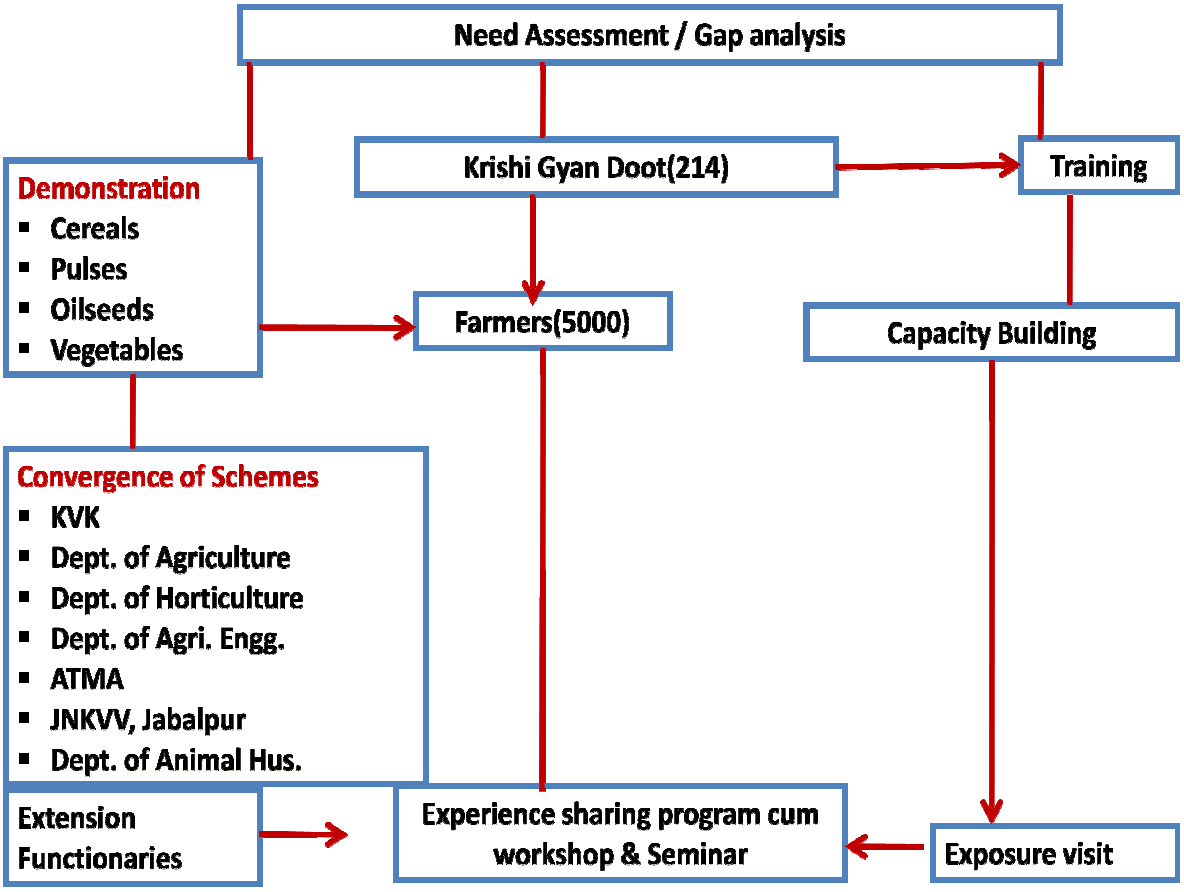
Farmer to Farmer (F-F) extension approach in agriculture is systematical utilization of community leadership and informal communication between the farmers to strengthen information flow and enhance agricultural production. Communication of scientific ideas will be more effective due to homogenous social system, norms, culture, available natural, social and scientific resources. It will reduce the burden on state extension systems, and new technologies will reach the critical mass, which can diffuse among societies afterwards. KVKs in this directorate are also using various models for dissemination of technology through Farmer to Farmer extension Model. Some of the models are given below.

KVK Models:

1. **KVK Satna:**

KVK is following a unique experiment for promoting agricultural activities through Krishi Gyan Doot to 5000 farmers in the district.

Technology Dissemination through Krishi Gyan Doot:

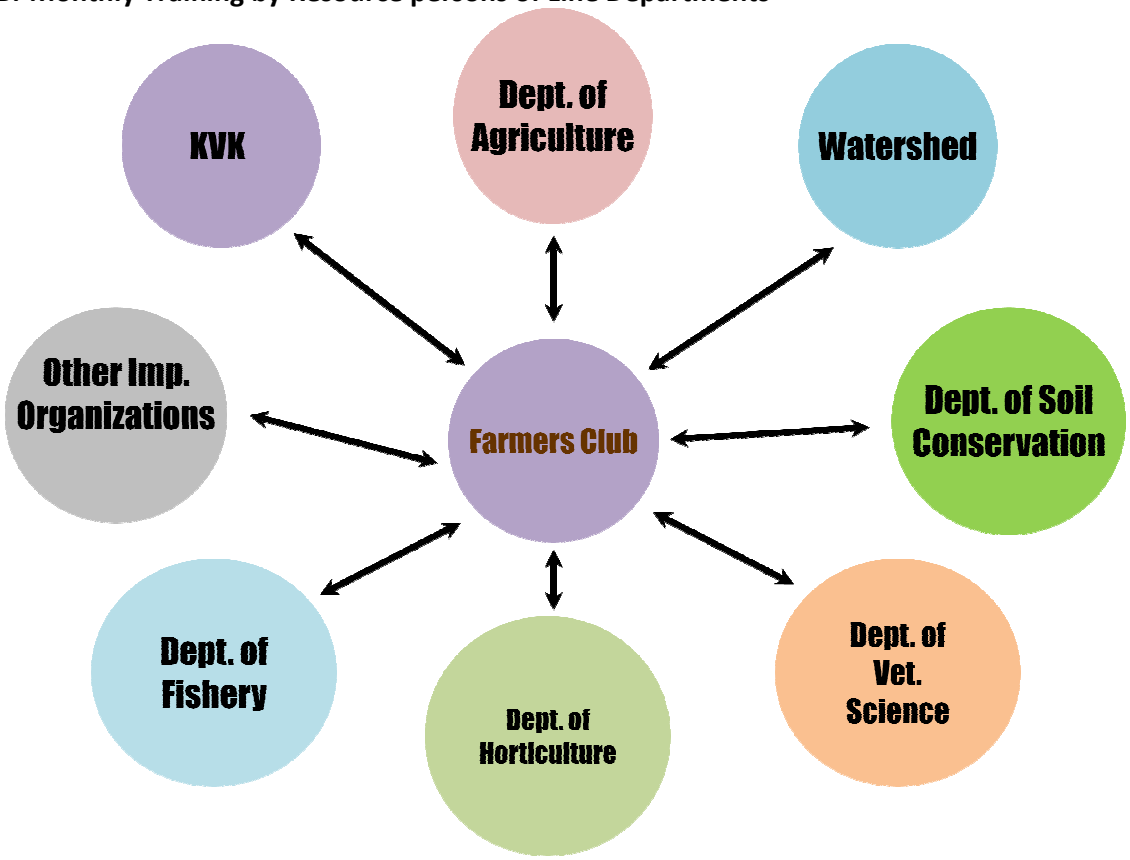


2. KVK Ganjam-I

Methodology:

Initially eleven farmers club were constituted in eleven blocks of the district on pilot basis. Identification of volunteers of Farmers Clubs as Para Extension Agents was done. Capacity building programmes for Volunteers were undertaken to enable them to provide location specific advisory services. Capacity building activities includes Bimonthly training, Diagnostic field visits, Farm literatures, Organizing demonstrations, Sharing knowledge and information with clientele, Motivating the farmers and farm women in adopting farm technology, Scientific exposures and SMS based agri-advisory services.

Bi-Monthly Training by Resource persons of Line Departments



2. National Initiative for Fodder Technology Demonstration (NIFTD):

The programme is implemented in 11 KVKs of this directorate with technical guidance from IGFRI, Jhansi. 11 KVKs are implementing this programme namely datia, Sagar, Panna, Chhattarpur,Ratlam, Neemuch from Madhya Pradesh and Deogarh, Angul, Sundergarh, Kalahandi and Nuapara. The programme includes various Technology Demonstration Modules as mentioned below.

Technology Demonstration Modules (TDMs)
In order to address the feed resources related issues of the selected villages under different districts, different interventions will are planned with three modules. However the specific intervention under each module for a particular village is need based and decided upon categories of livestock and farming resource situation of that village. The three intervention modules are as follows-

TDM 1: Forage production from arable lands

This module comprises of introducing suitable fodder crops/varieties with improved package of practices, location specific intercropping systems with high sustainable yields, forage production systems for assured supply of fodder under irrigated and rainfed situations, utilizing problem soils (acidic, salt affected, waterlogged sites) for fodder production and exploring possibility for use of non-competitive land use for fodder.

TDM 2: Forage production from non-arable lands

This module includes interventions related to enhancing forage production from rangelands/ degraded lands like introducing suitable range grasses/legumes/fodder trees, improved management practices of pastures, soil and water conservation practices, and establishment of silvipasture / hortipasture systems on private/community lands on participatory basis.

TDM 3: Forage utilization and processing for balanced diets

This module comprises of enrichment of crop residues and dry forages, feeding of green forages, bailing and densification of surplus fodder through custom hiring of required machines, preparation of hay and silages, formulation of complete feeds utilizing locally available feed and fodder resources, supplementation area specific mineral mixture and leaf meals, popularization of chaff cutters etc.

3. Parthenium Awareness Week Celebration in Zone VII:

KVKs under this directorate are organising Parthenium Awareness Week from 16.8.13 to 22.8.13 to create awareness about the hazards and various control measures of parthenium. Various activites like Lectures, Rallies, programme with school students, among farm women are organised during this week. farmers are made aware about the health hazards for animals as well as human because of this weed including number. of skin diseases caused by this weed. The farmers have been advised to adopt community approach in controlling this weed.

Kisan sangosthi were being organized in which scientists deliverd lectures about the parthenium, right from its germination to seed formation as well as their control measures through chemical, mechanical and biological methods.

Jabalpur, Indore, Harda, Khargone, Bhind, Rewa, Seoni, Shahdol, Mandla from Madhya Pradesh, Gajapati, Kalahandi, Nayagarh, Sambalpur from Odisha and Bilaspur, Dhamtari, Kanker, Rajnandgaon, Dantewara, Kawardha, Raigarh from Chhattisgarh have organised and elebrated Parthenium Awareness Week in the KVK.

4. Tribal Sub Plan- Odisha KVKs:

Tribal Sub Plan is operational in 22 tribal dominated KVKs of this directorate where tribal population in the district is more than 50 percent. The KVKs includes Dindori, Mandla, Badwani, Dhar, Jhabua from Madhya Pradesh, Bastar, Dantewara, Jashpur, kanker, Ambikapur, Balrampur, Bijapur and Narsynpur from Chhattisgarh and Gajapati, Kandhamal, Malkangiri, Mayurbhanj-I, Mayurbhanj-II, Nabarangpur, Rayagada, Sundergarh-I and Sundergarh-II from Odisha.

The programme for these KVKs has been finalised on the Workshop held at KVK Kanker on 9-10/7/2013. The activities are focussed on employment generation for tribal people. Various activities include Bee keeping, Mushroom Cultivation, backyard poultry, Homestead gardening to support nutrition of the tribal families. Homestead gardening has helped to some extent in improving nutritional intake of tribal peoples. Emphasis has also been given on vegetable cultivation, minor millets processing etc. Various training programmes are being organised for tribals to impart skills and knowledge to them about scientific practices. Group and community approaches are being followed in this programme. As the literacy percentage among tribals is very low, focus is being given to provide them with pictorial literature in the local language.

15. Zonal Project Directorate's Publications

i. Research Articles

1. S.R.K.Singh, A.P. Dwivedi, Anupam Mishra and S.Chouhan (2013). Yield Gap Analysis Vis-à-vis Factor Affecting Sugarcane Production in Madhya Pradesh. *Journal of Community Mobilization and Sustainable Development*, Vol. 8 (1), 60-63, Jan. – June, 2013.
2. S.R.K.Singh, U.S.Gautam, A.P.Dwivedi, S.K.Pandey and K.Sandhu (2012). Constraints Perceived by the Dairy Personnel in the functioning of Dairy Plants in Bihar – A study in Organizational Perspectives. *Journal of Ext. Edu.*, Vol. XVII (1), 2012, Pp. 21-26.
3. S.R.K.Singh, U.S.Gautam, A.P.Dwivedi, S.K.Pandey,K.Sandhu (2012).Constraints Perceived by the Dairy Personnel in the Functioning of Dairy Plants in Bihar-A study in Organizational Perspectives. *Journal of Extension Education,*Vol.1,Pp21-26.
4. A.P.Dwivedi, A.Mishra, R.P.Singh, V.Dwivedi and MamtaSingh (2012).Communication support for enhancing IPM in Pigeonpea. *Journal of Extension Education,*Vol.2,Pp161-171.
5. Chand, P. Sirohi, S and Sirohi, S. K. 2013. Production and Demand Estimates of Livestock Feed and Fodder in Rajasthan. *Indian Journal of Animal Nutrition,* 30 (2) : 149-156
6. Chand, P. Sirohi, S and Sirohi, S. K. 2014 (Accepted). What determines sustainability of dairy farming? Empirical evidence from north-western dry region of India. International Journal of Agricultural and Statistical Sciences, 10 (2):
7. R.P.Singh ,A.P.Dwivedi, A.Mishra, D.Singh, Mamta Sigh(2012).Assesment of IPM technology in Brinjal through farmers participatory approach for improving livelihood security. *Journal of Extension Education,*Vol.2,Pp126-129.
8. M. Singh A.P. Dwivedi, A.Mishra, R.P.Singh, S.R.K. Singh and Prem Chand (2013). Adoption Level and Constraints of Soybean Production Technology in Sagar District of Madhya Pradesh. *Journal of Community Mobilization and Sustainable Development*, Vol. 8 (1), 94-99, Jan. – June, 2013.
9. R.P.Singh,A.N.Singh,A.P.Dwivedi,A.Mishra,M.Singh(2012).Assesment of Yield Gap Through Frontier Technology. *Journal of Extension Education,*Vol.1,Pp85-89.
10. R.K.Singh, S.R.K.Singh, U.S.Gautam, A.P.Dwivedi(2012). Productivity Enhancement of Soybean and Wheat Crop Through Balance Dose of Fertilizers. *Journal of Extension Education,*Vol.1,Pp81-84.
11. S.Chouhan, S.R.K.Singh, A.K.Pande, U.S.Gautam (2013). Adoption dynamics of improved sugarcane cultivation in Madhya Pradesh. *Indian Res. J. of Ext. Edu*., Vol. 13 (2), May., 2013, Pp. 26-30.
12. R.S.Chauhan, S.R.K.Singh, Y.D.Mishra, P.Singh, M.K.Bhargava and H.P.Singh (2013). Impact of Front Line Demonstration (FLDs) on Gram (Chickpea) in Shivpuri District of Madhya Pradesh. *Journal of Community Mobilization and Sustainable Development*, Vol. 8 (2), 205 - 208, July - December, 2013.
13. H.P.Singh, S.R.K.Singh, B.S.Gupta, G.S.Chundawat, D.Singh and S.P.Tripathi (2013). Analyzing yield gap and economics of black gram through frontline demonstrations in Mandsaur district of Madhya Pradesh. *Agriculture Update,* Vol. 8 (3), August, 2013, Pp 492-495.

14. N.Kumari, S.R.K.Singh, S.K.Jha and S.B.Choudhary (2014). Accelerating socio-economic condition of women through Makhana cultivation in Bihar. *Indian Res. J. of Ext. Edu*., Vol. 14 (1), January 2014, Pp. 102-104.
15. R.K.Singh, S.R.K.Singh, T.K.Singh, U.S.Gautam and A.K.Dixit (2013). Yield performance of soybean in Vindhyan Plateau of Madhya Pradesh. Soybean Research, Vol. 11 (1), Pp. 66-73.
16. P.Rajan, M.K.Dubey, S.R.K.Singh and M.A.Khan (2013). Factors affecting knowledge of fish farmers regarding fish technology. *Indian Res. J. of Ext. Edu*., Vol. 13 (2), May., 2013, Pp. 126-128.
17. S.Kaushik, B.L.Chandrakar, S.R.K.Singh and S.Kumar (2013). Effect of various weed control treatment on economics of direct seeded rice under puddle condition. *Agriculture Update,* Vol. 8 (4), Nov., 2013, Pp 645-647.
18. Singh, K. P., Nair, B., Chand, P. and Naidu A. K. 2013. Contribution of fenugreek (Trigonella foenum graecum L.) seeds towards the nutritional characterization. *Journal of Medicinal Plant Research.* Vol. 7 (41): 3052-3058.
19. Singh, K. P., Nair, B., and Chand, P. 2013. Crop Assortment Index: A tool for measuring composite performance of different fenugreek genotypes. *Turkish Journal of Field Crops.* Vol. 18 (2): 215-128
20. Singh, M., Dwivedi, A. P., Mishra, A., Singh, R. P., Singh, D. Singh, S. R. K. and Chand, P. 2013. Adoption level and constraints of soybean production technology in Sagar district of Madhya Pradesh. *Journal of Community Mobilization and Sustainable Development,* Vol. 8 (1): 94-99.
21. Mamta Singh, A.P.Dwivedi, K.S.Yadav (2013). Integrated crop management for enhancing sustainable production potential in soybean. *Bioved,*Vol.24(2),Pp151-156.

ii. Technical Bulletins/ Mannual

1. S.R.K.Singh and Anupam Mishra (2014). Mechanization Gaps in Rainfed Agriculture – Assessment by KVKs. Zonal Project Directorate, Zone VII, Jabalpur.
2. S.R.K.Singh and Anupam Mishra (2014). Technological Interventions on Farm Mechanization: Experiences and Impact of KVKs. Zonal Project Directorate, Zone VII, Jabalpur.
3. Anupam Mishra and S.R.K.Singh (2014). Crisis management for Cyclone affected districts in Odisha. Zonal Project Directorate, Zone-VII Jabalpur Madhya Pradesh.
4. S.R.K.Singh and Anupam Mishra (2014). Technological Interventions on Animal Husbandry by KVK: Performance and Impact. Zonal Project Directorate, Zone-VII, Jabalpur Madhya Pradesh.
5. Anupam Mishra, S.R.K.Singh, U. S.Gautam, A.P. Dwivedi, Prem Chand and Tushar Athare (2013). Capacity Building of KVK Personnel - *Proceedings*. Zonal Project Directorate, Zone-VII, Jabalpur Madhya Pradesh.

6. Anupam Mishra, S.R.K.Singh, Prem Chand and Tushar Athare (2013). KVK-ATMA Joint Efforts for Sustaining Double Digit Growth in Madhya Pradesh - Progress Report. Zonal Project Directorate, Zone-VII, Jabalpur Madhya Pradesh.
7. Anupam Mishra, S.R.K.Singh, U. S.Gautam, A.P. Dwivedi, Prem Chand and Tusar Athare (2013). KVK Interventions on Technology Integration: Experiences & Impact. Zonal Project Directorate, Zone-VII Jabalpur Madhya Pradesh.
8. K.D.Kokate, Ashok Kr. Singh, Lakhan Singh, A.K.Singh, S.K.Roy, N.Sudhakar, K.Dattatri, Y.V.Singh, Rajiv Baliram Kale, Anupam Mishra, A.P.Dwivedi, S.Prabhu Kumar, DVS Reddy (2013). Harnessing Pulse Productivity. Division of Agricultural Extension, ICAR, New Delhi.

Books

1. S.R.K.Singh and S.K.Jha (2014). Organizational diagnosis of smallholders' dairying: Integrating theory and applications. Scholar's Press. Germany (ISBN: 978-3-639-71809-6). (*In press*)
2. Chand, P and Sirohi, S. 2014. Assessment of livestock sustainability in developing countries: approaches and application. Scholar's Press. Germany (ISBN: 978-3-639-70849-3).
3. Singh, K. P., Nair, B. and Chand, P. 2014. Fundamentals of vegetable crop production. Scientific Publisher, Jodhpur, India (ISBN: 978-81-7233-902-9).

iii. Book Chapters

1. S.R.K.Singh, U.S.Gautam, Anupam Mishra, N. Kumar (2013). Promoting Resource Conservation Technologies in Pulses through Krishi Vigyan Kendra**.** *In*: Resource Conservation Technologies in Pulses, IIPR, ICAR, Kanpur. Pp. 642-653.
2. Anupam Mishra and S.R.K.Singh (2013). Technological options for intensification of the smallholders farms. *In*: Souvenir: 8th National Conference on KVK -2013 held during October 23-25, 2013 at USA, Bangalore, Pp. 86-104.
3. Anupam Mishra and S.R.K.Singh (2013). Impact of Farmers' Particiaptory Programme to enahnce chickpea production in Madhya Pradesh. *In*: Souvenir: 18th Annual Group Meet – All India Coordinated Research Project on Chickpea held during 24-26 August, 2013.

4. Prem Chand, Anupam Mishra, S.R. K. Singh, A. P. Dwivedi and Tusar Athare (2013) Production and marketing of paddy in Assam. In: *Agribusiness Potentials in India: Experiences from hills states. (Edited by Ram Singh, Dibakar Naik and S.M. Feroze), Eastern Book House Publisher, Guwahati.* Pp. 38-49.
5. B. S. Chandel, Prem Chand and J. P. Dhaka (2014). Marketing Efficiency in Domestic Trade of Milk and Milk Products" In: Sustainable Rural Development through Agriculture. (Accepted)
6. K.P Singh, Beena Nair, Prem Chand, S. K. Sharma and A.S. Bhati (2014) Sustaining vegetable production through farmers' own seed-An integrated approach" In: Sustainable Rural Development through Agriculture. (Accepted)
7. G. L. Meena, D. C. Pant, V. P. Chahal and Prem Chand (2014) Agribusiness in India: An overview" In: Sustainable Rural Development through Agriculture. (Accepted)
8. G. L. Meena, S. S. Burdak, V. P. Chahal and Prem Chand (2014) Rural development through agro-based industries in India" In: Sustainable Rural Development through Agriculture. (Accepted)

iv. Presentations in Conferences/Symposia/Seminars/Other forums

1. S.R.K.Singh, Anupam Mishra, U.S.Gautam, A.P.Dwivedi and D.Kathal (2013).Enhancing the Climate Resilience of Farmers through Appropriate Horticultural Interventions-A KVK Extension Model. *National Seminar on Climate Change and Indian Hrticulture* held during 25-27 May,2013 at BAU,Sabour,Bihar.
2. S.R.K. Singh, Anupam Mishra, U.S.Gautam and A.P.Dwivedi (2013). Enhancing the climate resilience of farmers through appropriate technological interventions – NICRA experiences. Paper presented during *International Conference on Extension Education Strategies for Sustainable Development – A Global Perspective* held at UAS, Bangalore during Dec. 5-8, 2013.
3. S.R.K. Singh, Anupam Mishra, U.S.Gautam, A.P.Dwivedi and Prem Chand (2013). Accelerating soybean production by reducing technological vis-à-vis extension gaps through participatory approach. Poster Paper presented in International Soybean Research Conference–SOYCON 2014 held during Feb. 22-24, 2014 at DSR, Indore.
4. S.R.K.Singh**,** U.S.Gautam, Anupam Mishra, Tushar Athare **(2013).** Kisan Mobile Advisory: An innovative ICT-tool for increasing outreach of KVKs. Paper presented during *International Conference on Extension Education Strategies for Sustainable Development – A Global Perspective* held at UAS, Bangalore during Dec. 5-8, 2013.
5. S.R.K.Singh and Anupam Mishra (2014). Accelerating Field Application of Biotechnology to Agriculture for Sustainable Development of India. Abstract in National Seminar at Tata College, Sidhi during 29-30 March, 2014.
6. S.R.K. Singh, Anupam Mishra, A.P.Dwivedi and Prem Chand (2014). Weed management technology application in rice- A KVK approach. Extended summary in Biennial Conference of Indian Society of Weed Science on "Emerging Challenges in

Weed Management" February, 15-17, 2014. Directorate of Weed Science Research, Jabalpur Madhya Pradesh.

7. Singh, K. P., Nair, B. Jain, P. K. and Chand, P. (2013). National Seminar on Protected Cultivation of Horticultural Crops and Value Addition, 29-30 November, 2013 organised at Department of Horticulture, Allahabad School of Horticulture, Allahabad, UP.
8. A.P.Dwivedi,Mamta Singh,Anupam Mishra,S.R.K.Singh(2013).Extent of Adoption of Improved Soybean Production Practices in Sagar District of Madhya Pradesh.International Soybean Research Conference held during 22-24 February,2013 on *Mitigation Productivity Constraints in Soybean for Sustainable Agriculture* organized jointly by Society of Soybean Research and Development;Directorate of Soybean Research,Indore and ICAR,N.Delhi.
9. A.P.Dwivedi,Anupam Mishra andS.R.K.Singh(2013).Enhancement of Soybean Productivity through Varietal Intervention-A Farmers Participatory Approach. International Soybean Research Conference held during 22-24 February,2013 on *Mitigation Productivity Constraints in Soybean for Sustainable Agriculture* organized jointly by Society of Soybean Research and Development;Directorate of Soybean Research,Indore and ICAR,N.Delhi.
10. S.R.K.Singh,Anupam Mishra,U.S.Gautam,A.P.Dwivedi and Prem Chand (2013).Accelerating Soybean Production by Reducing Technological VIS-À-VIS Extension Gap through Participatory Approach. International Soybean Research Conference held during 22-24 February,2013 on *Mitigation Productivity Constraints in Soybean for Sustainable Agriculture* organized jointly by Society of Soybean Research and Development;Directorate of Soybean Research,Indore and ICAR,N.Delhi.
11. Dinesh Singh,R.P.Singh and A.P.Dwivedi(2013). Crop Cafteria:An Innovative Approach for Transfer of Technology.UP Agricultural Science Cngress(2013).UP Agricultural Science Cngress(2013)Held during 17-19 August,2013 organized by Indian Society of Extension. Education,N.Delhi;NDUA&T,Faizabad at Lucknow
12. Mamta Singh,K.S.Yadav,A.P.Dwivedi and P.K.Mishra (2013). Increasing Pulse Production for Food,Nutritional and Livelihood Security of Rural People through Frontier Technology.UP Agricultural Science Cngress(2013).UP Agricultural Science Congress(2013)Held during 17-19 August,2013 organized by Indian Society of Extension Education, N.Delhi;NDUA&T,Faizabad at Lucknow
13. R.P.Singh,Dinesh Singh,A.P.Dwivedi and Mamta Singh (2013).IPM Technology in Chickpea:Adoption and Constraints.UP Agricultural Science Congress(2013).UP Agricultural Science Congress(2013)Held during 17-19 August,2013 organized by Indian Society of Extension. Education, N.Delhi;NDUA&T, Faizabad at Lucknow.
14. Dinesh Singh, R.P.Singh and A.P.Dwivedi (2013). Technology Evaluation and Dissemination through crop cafeteria among farming communities. International Conference: Extension Educational Strategies for Sustainable Agricultural Development-A Global Perspective held during 5-8 December,2013 at University of Agricultural Sciences, Bangalore, India organized by International Society of Extension Education(INSEE),Nagpur.
15. Mamta Singh, K.S.Yadav, A.P.Dwivedi, Vinita Singh and A.K.Tripathi (2013). Gap in Pulse Production in Sagar district of Vindhyan Pleautu Agro-Climatic Zone of Madhya Pradesh :An assessment through Frontier Technology. International Conference:

Extension Educational Strategies for Sustainable Agricultural Development-A Global Perspective held during 5-8 December,2013 at University of Agricultural Sciences, Bangalore, India organized by International Society of Extension Education(INSEE),Nagpur.

16. R.P.Singh, Dinesh Singh, A.P.Dwivedi and Mamta Singh (2013). Assessment of Integrated Disease Management Practices in Cauliflower through Farmers Participatory Approach. International Conference: Extension Educational Strategies for Sustainable Agricultural Development-A Global Perspective held during 5-8 December,2013 at University of Agricultural Sciences, Bangalore, India organized by International Society of Extension Education(INSEE),Nagpur.

v. Technical/ popular articles

1. **S.R.K.Singh** and Anupam Mishra (2014). *Kisano ka hamsafar-krishi Vigyan Kendra*. Kheti. February 2014, Pp. 52-54.
2. **Prem Chand**, Anupam Mishra, S R K Singh and V P Chahal. 2014. ICT applications in agricultural extension: The Indian experiences. Country Paper in ASEAN Training Programme on "IT Application for Agricultural Extension (e-extension)" during 6-17 January 2014. (Communicated)
3. K. P. Singh, Beena Nair and **Prem Chand** (2013) "Career in Horticulture" *Employment News*, Vol. XXXVIII(36):1&56
4. आदित्य प्रकाश द्विवेदी एवं वी. पी. सिंह (2013). हरित गृह (ग्रीन हाउस) : सिद्धांत एवं उपयोग। तृण संदेश, वार्षिक पत्रिका : प्रकाशक खरपतवार विज्ञान अनुसंद्यान निदेशालय, जबलपुर। अंक – नवम् , 2012–13, पृष्ठ सं. 15–19.

16. ATIC Annual Report

A. Details on ATIC

S. No	Name of the ATIC	Name of the Host Institute	Name of the ATIC Manager
1.	ATIC, Jabalpur	JNKVV., Jabalpur(M.P.)	Dr. Deva Kant Professor & I/c
2.	ATIC, Raipur	IGKV, Raipur	Dr. S.S. Tuteja
3.	ATIC, Bhubaneswar	OUAT, Bhubaneswar	Dr.(Mrs.) Bishnupriya Mishra
4.	ATIC, CIFA, Odisha	Central Institute of Freshwater Aquaculture (CIFA) Kausalyaganga, Bhubaneswar, Odisha	Dr. P.N.Ananth PC, KVK, Khordha & I/c
5.	ATIC, CIAE, Bhopal	Central Institute of Agricultural Engineering, Bhopal, M.P.	Er. S.S. Mandvikar, T-9

B. Details on Farmer's visit

S. No	Purpose of visit	Number of farmer's visited
01	Technology Information	21621
02	Technology Products	4744
03	Others (Diagnostic Services, Extension personnel etc.)	3095
	Total	**29460**

C. Facilities in the ATIC which are in operation

S. No	Particulars	Availability (Please √ mark)	Number of ATICs
01	Reception counter	√	5
02	Exhibition / technology museum	√	4
03	Touch screen Kiosk	√	3
04	Cafeteria	√	4
05	Sales counter	√	5
06	Farmer's feedback register	√	5
07	Others (Visitors register Stock store register Telephone etc.)	√	4

D. Technology information provided

D.1. Details on technology information

S. No	Information category	Number of ATICs	Total number of farmers benefitted	Category of information						
				Varieties / hybrids	Pest management	Disease management	Agro-techniques	Soil and water conservation	Post Harvest technology and Value addition	Animal Husbandry and fisheries
1	Crop & Livestock	1	770	80	50	62	144	38	324	72
2	Fish culture	1	3145	0	0	0	0	0	0	3145
3	Kisan Call Centre / other Phone calls from farmers	3	1589	226	380	230	461	52	219	21
4	Letters received	2	39	7	12	6	10	0	4	0
5	Letters replied	2	39	7	12	6	10	0	4	0
6	Training to farmers / technocrats / students	2	666	20	225	50	190	55	90	36
7	Video shows	2	2470	120	432	614	1074	50	180	0
	Total	**13**	**8718**	**460**	**1111**	**968**	**1889**	**195**	**821**	**3274**

D.2 . Publications (Print & Electronic media)

S. No	Particulars	Numbers sold	Revenue generated in Rs.	Number of farmers benefited
1	Books & Technical Bulletins	71452	1810695	11642
2	Cost of Cultivation	76	3800	76
3	DVDs (Videos of CIAE Technologies)	496	24,800	500
4	Pulse Production	42	630	42
5	Rearing of Emu Bird	113	1130	113
6	Scientific cultivation of Sugarcane	233	2330	233
7	Others if any (Krishi Panchang, Farm magazine & booklets)	66154	1304428	32
	Total	**138566**	**3147813**	**12638**

E. Technology Products provided

S. No	Particulars	Quantity	Unit of quantity	Value in Rs.	Number of farmers benefited
1	Jawahar Seeds	177	qtl	496880	423
2	Prototypes of Improved Agricultural Machinery	4565	Nos.	81.96	Beneficiaries are Farmers and Manufacturers, Govt. and NGOs to further popularize/provide the agricultural engineering technology to farmers
3	Agro processed products including soy-products, feed products, plant material, equipment, CDs, energy products etc are sold through ATIC.	21893, Cattle Feed(3650 kg), Wheat Flour , (7625 kg), Tur dal , (1331 kg), Chick pea Flour (Besan), (6831 kg), Maize Flour(1600 kg), Gram,	Kg.	10.45	3000

S. No	Particulars	Quantity	Unit of quantity	Value in Rs.	Number of farmers benefited
		(597kg), Multi-Nutrient Biscuits , (259 kg) and other items			
4	Sale of farm produce			553671	
5	Sale of fish and poultry			1282761	
	Total	**26635**	**Qtl, Nos. & Kg.**	**2333404**	**3423**

F. Technology services provided

S. No	Particulars	Number of farmers benefited
1	Details about the services to line Departments	134
2	Farmer's visited ATIC	1899
3	Mechanization Planning Advisory	100
4	Plant diagnostics	90
5	Soil and water testing	0
6	Soil Health Cards issued & Farmers' training conducted in KVKs & NGOs	3000
7	Technologies on freshwater aquaculture (hatchery management, grow out culture and post harvest technology)	1621
8	Through Kisan Call Centre	722
9	Through Letters	31
	Total	**7597**