



Annual Report 2015-16

Technology Demonstration Component

NATIONAL INNOVATIONS IN CLIMATE RESILIENT AGRICULTURE



**ICAR - AGRICULTURAL TECHNOLOGY APPLICATION RESEARCH INSTITUTE
(ATARI)**

Indian Council of Agricultural Research
Adhartal, Jabalpur 482 004 (Madhya Pradesh)

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Foreword

Climate change is an environmental concern for India while we try and ensure food and nutritional security for growing population. In the recent past, on or the other part in the country was affected by drought excessive rain, flood, cyclone, frost, heat wave or other climatic events. These extreme events severely impact agriculture production, the livelihood systems of small and marginal farmers who constitute nearly 80% of the farmer in the country. Since, agriculture contribute to about 16percent of Indian GDP, a 4.5-9 percent negative impact on production due to climate change warrant varieties and technologies for achieving climate resilience in agriculture. The technology demonstration component (TDC) of the **National Innovations in Climate Resilient Agriculture** (NICRA) addresses the issues of enabling farmers through demonstration on climate resilience technologies.

I am glad that this component in short period of time has generated enormous interest and enthusiasm amongst the farmer.

I complement the team at ATARI, Jabalpur that has compiled the initial out come from the seventeen NICRA KVKs in the form of NICRA Annual Report 2014-15. I also complement all the KVKs and the farmers who are working with the KVKs and taking active part in this very important initiative. The experiences and lesson generated through this initiative will have a significant impact on shaping our strategy towards securing a climate resilience agriculture.

Executive Summary

ICAR-ATARI, Jabalpur monitors the performance of 17 NICRA KVKs namely Balaghat, Chhattarpur, Datia, Guna, Morena, Satna, Tikamgarh, Ratlam and Jhabua in Madhya Pradesh, Bhatapara, Bilaspur, Dantewara in Chhattisgarh, Kendrapara, Ganjam, Jharsuguda, Sonapur and Kalahandi in Odisha. These KVKs are conducting the field activities as per the approved action plan by ZPD Zone VII & CRIDA, Hyderabad.

During 2015-16, under Natural Resource Management module, a total of 1076 farmers benefited covering 1098.08 ha area in all activities. Eight old farm ponds were renovated to avoid flooding. Six new check dam were constructed/renovated, 303 farmers are benefited through In-situ moisture conservation practices and covering 192.5 ha area. Water harvesting and recycling for supplemental irrigation applications were followed by 473 farmers and 36 farmers used Zero tillage technology and other technologies for saving residual moisture etc.

In Crop Production module, a total of 3191 demonstrations were conducted on 1380.1 ha. area focused on drought tolerant varieties , advancement of planting dates of rabi crops to escape terminal heat stress, etc on Paddy chickpea, wheat, barley, moong, arhar and vegetable crops.

In Livestock and Fisheries module, 2031 farmers benefited covering the 5889 Units during the year 2015-16. Out of 5889 Unit, 2612 animals were vaccinated to boost immunity through prevention and, 1214 animals were de-wormed, health check-up of 528 animals was done and 960 animals and birds were covered under breed upgradation.

In Institutional interventions module, 2922 farmers benefited covering 514.5 ha area in year 2015-16. Out of 2922 farmers, 724 farmers benefited through Custom hiring service, 160 farmers by collective marketing and 370 farmers through climate literacy.

A total of 8900 farmers benefited through capacity building which comprised 7022 male and 1878 female through 302 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 10914 farmers benefited of which 1106 farmers through Field day, 1704 farmers by group discussion and 558 farmers benefited through Exposure Visit during the year.

सारांश

निकरा परियोजना के अंतर्गत भारतीय कृषि अनुसंधान परिषद अटारी जबलपुर में कुल सत्तरह कृषि विज्ञान केन्द्र कार्य कर रहे हैं। जिनमें मध्यप्रदेश में बालाघाट, छतरपुर, टीकमगढ़, गुना, मुरैना, दतिया, झाबुआ, रतलाम एवं सतना, छत्तीसगढ़ में बिलासपुर, भाटापारा एवं दंतेवाड़ा, तथा उड़ीसा में केन्द्रपारा, गंजम-1, झारसुगडा, सोनेपुर एवं कालाहांडी में स्थित है। ये सभी कृषि विज्ञान केन्द्र अटारी, जबलपुर तथा केन्द्रीय बारानी कृषि अनुसंधान संस्थान, है। दराबाद द्वारा अनुमोदित वार्षिक कार्य योजना के अनुसार अपनी परियोजना संबंधी गतिविधियां संपादित करते हैं। प्राकृतिक संसाधन प्रबंधन प्रतिरूपक के अंतर्गत अटारी, जबलपुर में कुल 1098.08 हेक्टेयर में प्रदर्शन लगाये गये जिसके द्वारा 1076 कृषक लाभांवित हुए। इस वर्ष में कुल आठ प्रक्षेत्र तालाबों का नवीनीकरण कराया गया। साथ ही छः नये रोधी बांध (चैक डेम) बनाये गये जिससे 303 कृषक लाभांवित हुये तथा कुल 192.5 हेक्टेयर क्षेत्र सिंचाई द्वारा लाभांवित हुआ। इसी प्रकार जल संचयन तथा संग्रहण द्वारा अतिरिक्त सिंचाई सुविधा द्वारा कुल 473 कृषक लाभांवित हुए एवं शून्य परिष्करण (जीरो टिलेज) तकनीक द्वारा 36 कृषक लाभांवित हुए। इस प्रतिरूपक में अन्य तकनीको जैसे टपक सिंचाई, फव्वारा सिंचाई, गहरी जुताई एवं अन्य विधियां भी प्रयोग में लाई गई हैं।

फसल उत्पादन प्रतिरूपक के अंतर्गत कुल 1308.1 हेक्टेयर क्षेत्र में 3191 प्रदर्शन प्रस्तुत किये गये जो सूखा सहनशील प्रजातियों, रबी फसलों की अग्रिम बुआई आदि को उद्देश्य मानकर गेहूँ, धान, चना, ज्वार, बाजरा आदि फसलों पर किये गये। वर्ष 2015 में पशुधन तथा मात्स्यिकी उत्पादन प्रतिरूपक में 2031 कृषकों तथा 5889 पशुधन प्रक्षेत्र द्वारा लाभांवित हुए कुल 5889 पशुधन में 2000 पशुओं का टीकाकरण किया गया ताकि पशुओं को रोगरोधक बना सकें साथ ही 1214 पशु कीट उन्मूलन कार्यक्रम एवं 528 पशु स्वास्थ्य परीक्षण शिविर द्वारा लाभांवित हुए, साथ ही जातियों के उन्नतिकरण द्वारा 960 पशु एवं पक्षी प्रदान किये गये। संस्थागत तकनीक प्रतिरूपक के अंतर्गत वर्ष 2015-16 में 514.5 हेक्टेयर क्षेत्र में 2922 कृषक लाभांवित हुए। कुल 2922 कृषकों से 724 कृषक कृषि यंत्र सुलभीकरण द्वारा, 160 कृषक संचय विक्रय द्वारा एवं 370 कृषक जलवायु परिवर्तन जागरूकता द्वारा लाभांवित हुए। सामर्थ्य विकास के 302 पाठ्यक्रमों द्वारा कुल 8900 कृषक लाभांवित हुए जिसमें 7200 पुरुष एवं 1878 महिलायें थीं। अन्य प्रसार गतिविधियों के विभिन्न विषयगत क्षेत्र आयोजनों से कुल 10914 कृषक लाभांवित हुए, जिसमें 1106 कृषक खेत दिवस 1704 कृषक सामूहिक चर्चा तथा 558 कृषक प्रक्षेत्र भ्रमण एवं संस्थान भ्रमण द्वारा लाभांवित हुए।



1. INTRODUCTION

India produces nearly 11,924 billion rupees per year in agricultural commodities, with contributions from livestock and fisheries accounting for roughly 20 percent of that value. Production of all commodities will be vulnerable to direct impacts (from changes in crop and livestock development and yield due to changing climate conditions and extreme weather events) and indirect impacts (through increasing pressures from pests and pathogens that will benefit from a changing climate). The agricultural sector continually adapts to climate change through changes in crop rotations, planting times, genetic selection, fertilizer management, pest management, water management, and shifts in areas of crop production. These have proven to be effective strategies to allow previous agricultural production to increase, as evidenced by the continued growth in production and efficiency across the India.

Climate change poses a major challenge to Indian agriculture because of the critical dependence of the agricultural system on climate and because of the complex role agriculture plays in rural and national social and economic systems.

Climate change has the potential to both positively and negatively affect the location, timing, and productivity of crop, livestock, and fishery systems at local, national, and global scales. It will also alter the stability of food supplies and create new food security challenges for the India as the world seeks to feed nine billion people by 2050. Indian agriculture exists as part of the global economy and agricultural exports have outpaced imports as part of the overall balance of trade. However, climate change will affect the quantity of produce available for export and import as well as prices.

The cumulative impacts of climate change will ultimately depend on changing global market conditions as well as responses to local climate stressors, including farmers adjusting planting patterns in response to altered crop yields and crop species, seed producers investing in drought-tolerant varieties, and nations restricting trade to protect food security. Adaptive actions in the areas of consumption, production, education, and research involve seizing opportunities to avoid economic damages and decline in food quality, minimize threats posed by climate stress, and in some cases increase profitability. Hence there is a strong need to use modern science along with indigenous wisdom of farmers to enhance climate resilience in Indian agriculture

Besides under taking research to develop location-specific climate resilient agriculture technologies there are needs to make immediate efforts to disseminate and demonstrate the scientific production technologies to farmers' field in more vulnerable regions. In order to deal with climate change in right perspective, it has therefore, been planned to organize extensive farmers' participatory approaches and demonstrations of location-specific climate resilient agricultural technologies/ package of practices developed by ICAR and SAUs as well as successful ITKs on farmers, in 17 most vulnerable districts of ICAR-ATARI, Jabalpur as part of National Innovation in Climate Resilient Agriculture (NICRA).



The technology demonstration components of NICRA envisages identifying climate vulnerabilities to agriculture in selected village in each of the 17 district based on climate related problem, farmers experience, perceptions and preparing and implementing, adaptation and mitigation strategies following a bottom to top approach. The focus of the programme is not only to demonstrate the climate resilient agriculture technologies but also to continued adoption of such practices in sustainable manner. One village from each district was selected on basis of concerned KVK of district.

Agro Climatic Zones NICRA KVK Districts profile and their Climatic vulnerability under ATARI, Jabalpur

State	District	Agro Climatic Zone	Climatic vulnerability
Madhya Pradesh			
<p>AGRO-CLIMATIC ZONES OF MADHYA PRADESH</p> <ul style="list-style-type: none"> I CHHATTISGARH PLAINS (Dindori) II NORTHERN HILLS ZONE OF CHHATTISGARH (Mandla, Dindori, Shahdol, Anuppur & Umaria) III KYMORE PLATEAU AND SATPURA HILLS (Jabalpur, Katol, Seoni, Rewa, Panna, Sidhi) IV VINDHYAN PLATEAU (Jagpur, Bhopal, Raipur, Sehore, & Vidisha) V CENTRAL NARMADA VALLEY (Durgampur, Hoshangabad & Herat) VI GIRI ZONE (Gwalior, Guna, Ashoknagar, Morena, Shivnagar, Sheopur & Bilaspur) VII BUNDELKHAND ZONE (Datia, Chhatarpur & Tikamgarh) VIII SATPURA PLATEAU (Chhindwara & Betul) IX MALWA PLATEAU (Indore, Ujjain, Neemuch, Dhar, Mandla, Dewa, Ratlam, Rajgarh) X NIMAR VALLEY (Khandwa Khargone & Badwan) XI JHABUA HILLS (Jhabua) 	Balaghat	Chhattisgarh Plain Zone	Drought
	Guna	Girid Zone	Drought
	Morena	Girid zone	Drought
	Datia	Bundelkhand Region	Drought
	Tikamgarh	Bundelkhand Region	Drought
	Chhatarpur	Bundelkhand Region	Drought
	Jhabua	Jhabua hills	Drought
	Satna	Kymore, Plateau & Satpura Hill Zone	Drought
	Ratlam	Malwa plateau	Drought
	Chhattisgarh		
<p>Agro Climatic Zones of Chhattisgarh</p> <ul style="list-style-type: none"> Northern Hills Zone Chhattisgarh Plains Zone Bastar Plateau Zone 	Bhatapara	Chhattisgarh Plain Zone	Drought
	Bilaspur	Chhattisgarh Plain Zone	Drought
	Dantewada	Bastar Plateau Zone	Soil erosion and heavy rainfall
Odisha			
<p>AGROCLIMATIC ZONES</p> <ol style="list-style-type: none"> 1. NORTH WESTERN PLATEAU 2. NORTH CENTRAL PLATEAU 3. NORTH EASTERN COASTAL PLAIN 4. EAST & SOUTH EASTERN COASTAL PLAIN 5. NORTH EASTERN GHAT 6. EASTERN GHAT HIGH LAND 7. SOUTH EASTERN GHAT 8. WESTERN UNDULATING ZONE 9. WESTERN CENTRAL TABLE LAND 10. MID CENTRAL TABLE LAND 	Kendrapara	East and south eastern coastal Plain Zone	Flood and cyclone
	Jhasuguda	Western Central Table Land zone	Drought and flood
	Sonepur	Western Central Table Land zone	Drought and flood
	Ganjam-I	North eastern Ghat zone	Drought
	Kalahandi	Western undulating Zone	Drought



2. NATURAL RESOURCE MANAGEMENT TECHNOLOGY

The sustainable use and management of natural resources demands an inter-disciplinary approach and sound knowledge on each specific resource, as well as on the ecological, economic, and social perspectives related to their use. It also calls for greater coordination at the global level. Natural resources management is one of the applications of ecology that looks into the sustainable management of not just individual ecosystems but entire landscape systems and functions. It identifies and highlights the prospects for institutional, technological, and policy innovations for community-based management of resources to reduce poverty, enhance food security, and ensure biodiversity and watershed management. It helps in answering climate related problems which hinder the agriculture growth. Enhancing the available water through surface and sub-surface storage structures is one of means of creating resilience at the local level for agricultural systems. This form of infrastructure development plays much more important role in low to medium rainfall NICRA KVKs rainfall variability and occurrence of intense rainy events are considered to be high.

In Zone-VII, under the natural resource management interventions module, on different technologies demonstrating in an area of 1098.08 ha are by involving 1076 farmers on specific interventions in NICRA villages. In Madhya Pradesh, total 893 farmers were benefited and total 1135.33 ha area covered, followed by CG 140.38 ha area by involving 212 farmers and 99.7 ha area in Odisha which covered the 182 farmers.

Silent achievements:

- Total eight old farm ponds were renovated through de-silting for life saving irrigation to corps and ground water recharge.
- Five new check dam were constructed/renovated under NICRA activities.
- Two wells were renovated and one ring well constructed under NICRA project.
- Total 303 farmers are benefited through In-situ moisture conservation practices and covering 192.5 ha area.
- In water harvesting and recycling for supplemental irrigation, total 495.78 ha area covered and 473 farmers were benefited.
- By green manure applications, total 37 farmers were benefited.
- Total 34.6 ha. area of 36farmers used zero tillage technology for using residual moisture.



2.1 In – situ moisture conservation

Under the natural resource management, technologies demonstrated at farmers field for in-situ moisture conservation were summer deep ploughing , ridge and furrow and green manuring. Other resource conservation technologies includes across the slope sowings, check bunds for soil and water conservations, enrichment of bio-mass through vermi compost, soil reclamation, mulching etc. demonstrated in farmers fields.

Summer deep ploughing: The advantage of summer ploughing was observed for water conservation, improvement in soil health and protection from soil borne insects. Under this intervention, four demonstration were conducted, which covered total 38 ha area involving 44 farmers in NICRA KVKs of Madhya Pradesh followed by Chhattisgarh covered 17.8 ha area by involving 51 farmers and in Odisha total 29 ha area covered which benefited the 24 farmers.



Deep ploughing demonstration

Ridge and furrow: For In – situ moisture conservation, ridge and furrow practice observed beneficial for water conservation and prevent to water logging condition because of proper drainage system. This intervention benefited the 136 farmers and covered 97.2 ha in three NICRA KVKs in 10 demonstrations. Similarly in Odisha total 37 farmers were benefited by covering 6.5 ha area.

Bund formation: In in-situ moisture conservation intervention bund formation were conducted in 4 ha area involving 11 farmers. This help in harvesting the rain water and increase in-situ moisture percentage of the additional income from the same field.



Ridge and furrow method of sowing



Bud formation for rain water harvesting

Table2.1: KVK wise In – situ moisture conservation activities and performance

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses)	No. of farmers	Area (ha)	Yield (q/ha)	Economics of demonstration (Rs./ha)			
						Gross Cost	Gross Return	Net Return	BCR
Bilaspur	Deep Summer Ploughing Crop- Paddy	Indira Rajeshwari & Seed drill for line sowing	10	5	35	29640	49350	19710	1.6
Bhatapara	Deep Summer Ploughing crop-Paddy	Mahamaya, fertilizer	15	4	34.8	33390	50460	17070	1.51
Dantewada	Summer deep ploughing followed by with Direct seeded Line Sowing Rice	MTU-1010	11	4.8	35.87	25112	49302	24190	1.96
Sonepur	Deep summer ploughing	Paddy Seed	24	29	38.8	23400	50440	27040	2.15
Tikamgarh	Deep summer ploughing (soybean)	MB plough	24	30	12.04	18300	38640	20340	2.11
Sonepur	Raising of farm bund	Paddy seed	6	2	37.2	22900	48360	25460	2.11
Balaghat	Bund making	Paddy	5	2	48.5	22500	68385	45885	3.03
Tikamgarh	Ridge and furrow method of sowing in soybean	Ridge and furrow implement	12	20	14.07	16500	39450	22950	2.31
Tikamgarh	Ridge and bed planting method of sowing black gram	Ridge and bed planter	12	24	14.5	14500	77280	62780	5.32
Tikamgarh	Ridge and bed planting of sowing in chickpea	Ridge and bed planter	12	5	18.9	20200	75600	55400	3.74
Jhabua	Ridge & Furrow-Soybean	Seed, Nutrient, Insecticide	20	8	13.6	16800	47583	30783	2.83
Jhabua	Formation of Furrow 30DAS- Maize	Seed, Nutrient, Insecticide	10	12.5	25.47	14750	28020	13270	1.9
Ratlam	Sowing of Soybean in Broad Bed and furrow system	JS-9560	1	0.4	15.6	16600	56160	39560	3.38
Satna	Ridge and Furrow technique in Pigeon pea	Ridge and furrow seed drill	20	5.8	4.7	22640	24440	1800	1.08
Satna	Ridge and Furrow technique in Black gram	Ridge and furrow seed drill	17	6.4	2.94	16750	11466	-5284	0.68
Satna	Ridge and Furrow technique in Green gram	Ridge and furrow seed drill	20	8.4	3.14	15680	14130	-1550	0.9
Satna	Ridge and Furrow technique in Soybean	Ridge and furrow seed drill	12	6.7	5.97	21270	16716	-4554	0.79
Jharshuguda	Ridge and Furrow method in Cowpea	Seeds	18	3	72	34000	108000	74000	3.16
Jharshuguda	Ridge and Furrow method in Colocasia	Planting material Corm	11	1.5	143	45000	171600	126600	3.8
Sonepur	Ridge & furrow method tomato cultivation	Seed	8	2	308	88000	2,46,000	158000	2.79



2.2 Water harvesting and recycling for supplemental irrigation

Water harvesting and recycling for supplemental irrigation were demonstrated at 473 farmers field in an area of about 495.78 ha through 21 demonstrations in Zone VII in which total 410 ha area covered involving 299 farmers. In Madhya Pradesh, demonstration 11 demonstration conducted by four KVKs. Similarly in Chhattisgarh, seven demonstrations conducted by three KVKs involving 128 farmers and covered 59.98 ha area. Three demonstration in this category conducted by three KVKs of Odisha covered the 25.8 ha area which benefited the 46 farmers. The purpose of this intervention was to recharge the ground water and make availability of water under the dry land situation. The mono-cropping converted in double cropping due to availability of the water and productivity per unit of land also increase due to life saving irrigation in drought condition.

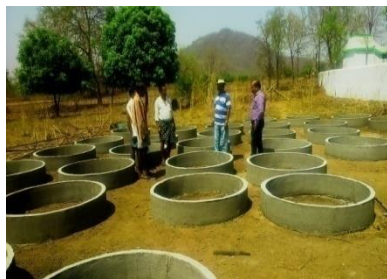


Check / stop dam construction /renovation: Under this intervention, stop dam or check dam was major activities for water conservation. In Madhya Pradesh, two sand bag check dam constructed, while provide the irrigation to 45 ha area and benefited 59 farmers.

Two KVKs of Chhattisgarh carried the check dam intervention in NICRA village by which 33.5 ha area covered by irrigation facilities and 66 farmers were benefited. In Odisha, by one demonstration, total 32 famers were benefitted by increasing number of irrigations.

Farm pond: Total eight number of demonstration conducted in Zone-VII in which Madhya Pradesh covered 13 ha area for irrigation involving 22 farmers followed by Odisha 10.5 ha area by which 48 farmer were benefitted through life saving irrigation. In Chhattisgarh, one farm pond was renovated involving 12 farmers which covered 15 ha of land.

Open well: Through open well renovation/recharge, irrigated area and no. of irrigation were increased. In Madhya Pradesh, 282.08 ha area covered under this intervention involving the 203 farmers. In Chhattisgarh, two demonstrations conducted, in which 1.48 ha area covered and 20 farmers were benefited. Sonepur KVK of Odisha covered 0.6 ha area for irrigation involving 3 farmers



Ring construction or open well



Digging of open well



Fully constructed open well

Table 2.2 KVK -wise water harvesting and recycling for irrigation and performance

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses)	No. of farmers	Area (ha)	Measurable indicators of output* [yield (q/ha.) & others]	Economics of demonstration (Rs./Well)			
						Gross Cost	Gross Return	Net Return	BCR
Sonepur	Construction of well and brinjal cultivation	Labour, well ring	3	0.6	232	72000	185600	113600	2.56
Balaghat	Bori Bandhan	Paddy seed	24	15	51.2	22900	72192	49292	3.10
Datia	Poly bag check dam	Groundnut seed	35	30	8.50	10000	18045	8045	1.80
Datia	Poly bag check dam	Black gram seed			4.25	8030	12154	4124	1.50
Datia	Poly bag check dam	Sesame			3.25	9000	28850	19850	3.20
Bhatapara	Check dam	Sluice Gate seed	18	21	5.40	11245	21600	10355	1.92
Dantewada	Stop dam	Renovation	48	12.5	28.45	14025	41252.5	27227.5	2.94
Ganjam -1	Check dam renovation	Labour, cement, stone	32	14	38.1	24100	53300	29200	2.21
Morena	Farm pond 70x50 x 7 Meter	Wheat var.RVW-4106	10	25	48	38820	91600	52780	2.30
Morena	Farm pond 70x50 x7 Meter)	Pearl millet	10	25	23.3	17000	35630	18630	2.00
Datia	Renovation of check dams	Soybean	40	35	11.95	34780	53775	18995	1.55
Datia	Renovation of check dams	Black gram			5.40	11245	21600	10355	1.92
Datia	Renovation of check dams	Groundnut			9.30	25600	41850	16250	1.63
Datia	Renovation of check dams	Sesame			4.01	8450	24060	15610	2.84
Bilaspur	Water harvesting in pond and using for supplementation in Paddy	Indira Rajeshwari & Seed drill for line sowing.	10	5	34	22000	47940	25940	2.11
Bilaspur	Water harvesting in pond and using in for Irrigation in wheat	Ratan & Seed drill, Roravator for line sowing.	20	5	24	19500	33600	14100	1.7
Dantewada	Irrigation pond	Renovation	12	15	26.05	13450	37772.5	24322.5	2.8
Sonepur	Renovation of farm pond and paddy cultivation	Labour	7	1.2	41.2	24100	53300	29200	2.21
Datia	De-silting of farm pond	Soybean	4	10	11..2	11200	31252.5	20052.5	2.79
Morena	Farm pod 70x50 Meter (7) repairing and maintenance	Wheat var.-RVW-4106	10	25	48	38820	91600	52780	2.3
Tikamgarh	Renovation of old wells	Convergence	180	280	40.11	20000	50000.0	30000.0	2.50
Dantewada	Ring well	Labour	10	0.68	25.85	13890	37482.5	23595.5	2.69
Dantewada	Open well	Labour	10	0.8	24.75	12745	35887.5	23142.5	2.81



2.3 Improved drainage in flood prone areas

Ridge and furrow method of sowing: Improved drainage is the major demand, particularly in kharif crop. By the five demonstrations of ridge and furrow sowing method on soybean, black gram, green gram and maize crops covered 96.2 ha area in Madhya Pradesh involving 47 farmers. In this intervention, it was observed that furrow worked as drainage channels, also helps in irrigation and moisture conservation in the root zone during dry spell.

Under this intervention, other demonstration like water way (by grass and use of loose boulder and pebbles) deep ploughing and check dam demonstrated for the purpose of check soil erosion and proper drainage.

Table 2.3 KVK- wise improved drainage techniques in flood -prone area

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses)	No. of farmers	Area (ha)	Measurable indicators of output*	Economics of demonstration (Rs./ha)			
						Gross Cost	Gross Return	Net Return	BCR
Balaghat	Drainage channel	Paddy	12	6.2	46.6	20250	65706	45456	3.2
Morena	Bed planting sowing method	Green gram var.-(TJM-3)	10	25	8.1	20000	67200	47200	3.36
Morena	Bed planting sowing method	Black gram var.- PU-35	10	25	8	19000	6800	46800	3.4
Morena	Bed planting sowing method	Maize hybrid	5	15	13	21000	91000	70000	4.3
Morena	Bed planting sowing method	Soybean var. JS-9560	10	25	14.6	28000	57060	29060	2.00

2.4 Artificial ground water recharge

Under artificial ground water recharge in Madhya Pradesh, three demonstrations were performed in NICRA villages and total 53 ha of area covered involving the 55 farmers. In Odisha total 0.4 ha of land covered under percolation tank intervention involving the 6 farmers.

Table 2.4 KVK wise artificial ground water recharge

KVK	Technology demonstrate	Critical input (Variety, Fertilizer / Chemicals doses)	No. of farmers	Area (ha)	Measurable indicators of output*	Economics of demonstration (Rs./ha)			
						Gross Cost	Gross Return	Net Return	BCR
Balaghat	Deepening of tank	Paddy Var. MTU-1010	3	2	45.22	20500	54264	33764	2.65
Ratlam	Recharging of tube well and dug well	convergence	50	50	41.88	20500	58632	38132	2.86
Ganjam-1	Percolation tank	labour	3	0.0027	38.8	23100	50440	27340	2.18
Sonepur	Percolation tank, paddy	labour	3	0.4	37.8	22800	49140	26340	2.15



2.5 Water saving irrigation methods

Sprinkler irrigation system: The sprinkler irrigation systems were established in wheat crop for efficient use of water performed by four demonstrations in Madhya Pradesh, laid out in 35 ha area involving 35 farmers. Similarly in Chhattisgarh, total eight farmers benefited by laying demonstration in 5.0 ha area.

Drip irrigation system: Drip irrigation in different vegetables crop covered 2.45 ha of land and benefited the six farmers in Madhya Pradesh. These practices help to save the water and reduce the water losses.

Two demonstration of drip irrigation conducted in Chhattisgarh which covered three ha of land with involving the six farmers.

In Odisha, two demonstrations conducted in 1.2 ha area in vegetable crops and benefited nine farmers of the adopted NICRA village.



Demonstration of Drip irrigation system

Table 2.5 KVK wise water saving irrigation methods

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses)	No. of farmers	Area (ha)	Measurable indicators of output*	Economics of demonstration (Rs./ha)			
						Gross Cost	Gross Return	Net Return	BCR
Tikamgarh	Drip irrigation in chili	Drip irrigation system	2	1	Yield(q/ha) T1-118 T2(162)	40500	293040	252540	7.25
Tikamgarh	Sprinkler in wheat	Sprinkler irrigation system	25	10	Yield(q/ha) T1(31.0) T2(38.2)	21300	57500	35470	2.6
Balaghat	Onion	Seed	2	1	218.6	65000	223050	158050	3.4
Balaghat	Cabbage	Seed	3	1	216.2	82000	292400	210400	3.5
MORENA	Sprinkler irrigation Raised Bed Sowing method	Wheat var. MP-4010	10	25	47.4	38820	90670	51850	2.33



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses)	No. of farmers	Area (ha)	Measurable indicators of output*	Economics of demonstration (Rs./ha)			
						Gross Cost	Gross Return	Net Return	BCR
Ratlam	Drip Irrigation with Fertigation System in Rabi Onion	Drip System	3	1.2	Yield 150Q/acre, Bulb weight 210g, Water saving 60%	24000	90000	66000	3.75
Ratlam	Drip Irrigation System in Summer Vegetable	Drip System	1	0.25	Yield 96Q/acre, Water saving 64%	18000	96000	78000	5.33
Bilaspur	Sprinkler irrigation Crop-wheat	Sprinkler system, Wheat variety-Ratan and provide Rotavator & Seed drill for line sowing	8	5	25.00	21000	35000	14000	1.6
Dantewada	Drip Irrigation	Tomato seed	6	3	365.00.	62850	234000	171150	3.72
Sonepur	Drip irrigation in Brinjal	Seed and drip accessories	2	0.4	24.30	92000	243000	151000	2.64
Sonepur	Drip irrigation in cauliflower	Seed and drip accessories	5	0.4	248.0	94000	272800	178800	2.9
Ganjam -1	Drip irrigation-tomato	seed	2	0.4	24.3	54000	121500	67500	2.26

2.6 Conservation tillage

Zero tillage method: In Madhya Pradesh, one demonstration of the under Zero tillage for wheat sowing were laid out in an area of 30 ha and benefited the 22 farmers. Similarly in Chhattisgarh in four demonstration covered 4.6 area by involving 14 farmers.

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses)	No. of farmers	Area (ha)	Measurable indicators of output*	Economics of demonstration (Rs./ha)			
						Gross Cost	Gross Return	Net Return	BCR
Tikamgarh	Zero tillage in wheat	Improved variety late sown irrigated	12	5	T1(32.0) T2(39.2)	21900	58740	36840	2.7
Morena	Zero tillage Sowing	Var.-RVW-4106	10	25	49	34000	82400	48400	2.4
Bhatapara	Zero tillage Wheat	Var.-Sujata, DAP 125 Kg per ha	5	2	19.5	11500	30225	18725	2.63
Bhatapara	Zero tillage Mustard	Var.-Pusa Bold, DAP 65 Kg per ha	4	1.2	9.2	12830	32660	19830	2.55
Bhatapara	Zero tillage Lathyrus	Var.-Mahatiwda	2	0.6	7.4	11250	26418	15168	2.35
Bhatapara	Zero tillage Rabi Pigeonpea	Var.-Asha	3	0.8	7.6	13900	57000	43100	4.1



Demonstration of Zero tillage sowing through Zero till seed drill

Other practices:

- The intervention green manuring use for improving the soil health and moisture conservation covered 30.6 ha of land involving 47 farmers.
- Through raised bed planter demonstration laid out in 52 ha area covering the 29 farmers of adopted village. Other three demonstrations on dry sowing of wheat and rice laid out in total 3.2 ha area including 10 farmers.
- One demonstration of deep ploughing conducted in 75 ha area and benefited the 40 farmers.
- Intervention as line sowing through seed cum ferti drill covered 9.2 ha of area involving 20 farmers.



3.CROP PRODUCTION

The impact of Climate vulnerability on crop production will be more due to climate variability, i.e. annual variation in rainfall, erratic distribution over time and space leading to frequent droughts and floods. However in the long term, climate change impacts are likely to manifest in terms of long dry spells, heavy rainfall in a short period and other extreme events like heat waves and cold waves which will have compounding effect on agricultural production. Warmer temperatures, in particular will effect crop growth and reproductive phase significantly. The impact of excess/deficit rainfall and warmer temperatures vary depending on the crop and season.

This module consists of technological interventions on the measures taken for bringing crop resilience viz. drought/temperature tolerant varieties, advancement of planting dates of rabi crops in areas with terminal heat stress, water saving paddy cultivation methods (SRI, aerobic, direct seeding), frost management in horticulture through fumigation, community nurseries for delayed monsoon, custom hiring centers for timely planting, location specific system with high sustainable yield Index.

Salient achievements

- Under this module, total of 619 farmers benefited using flood / drought / temperature tolerant varieties under crop production and covered 175.1 ha area.
- Total 110 were benefited demonstration conducted under water saving in paddy through SRI and DSR method.
- Under advancement of planting dates of rabi crops in areas with terminal heat stress covered 92.4 ha area.
- Total 804 demonstrations conducted under custom hiring centers for timely planting and covered 359.6 ha area.

3.1 Introducing flood / drought / temperature tolerant varieties

In demonstration on flood/ drought/ heat tolerant varieties of cereal, pulses, oilseed and horticultural crops were taken with specific objects. Total 548.5 ha involving 1130 farmers were covered in Zone VII under this intervention. In Madhya Pradesh, 678 farmers benefited by 432.4ha area demonstration fallowed by Chhattisgarh were demonstration laid out in 46.6 ha area involving 196 farmers. 256 farmers were benefited by 69.5 ha area demonstration in Odisha.



Introducing drought / temperature tolerant varieties in cereal crops: In Madhya Pradesh demonstration on cereal crops i.e. paddy, wheat, barley, maize and ragi were organized in an area of 69.6 ha involving 145 farmers. Drought tolerant, paddy variety MTU 1010 laid out in 4 ha area and benefited the 10 farmers. Similarly barley variety K-508 which is low water required variety needs two irrigation less than wheat crop. The wheat varieties JW-3020, HI-1531 and JW-17 demonstration performed under restricted irrigation these varieties were demonstrated in 16.8 ha area and benefited the 49 farmers. The average production under limited irrigation is 31.55 q/ha and BC ratio found 2.26 over farmers varieties 18.99 q/ ha and BC

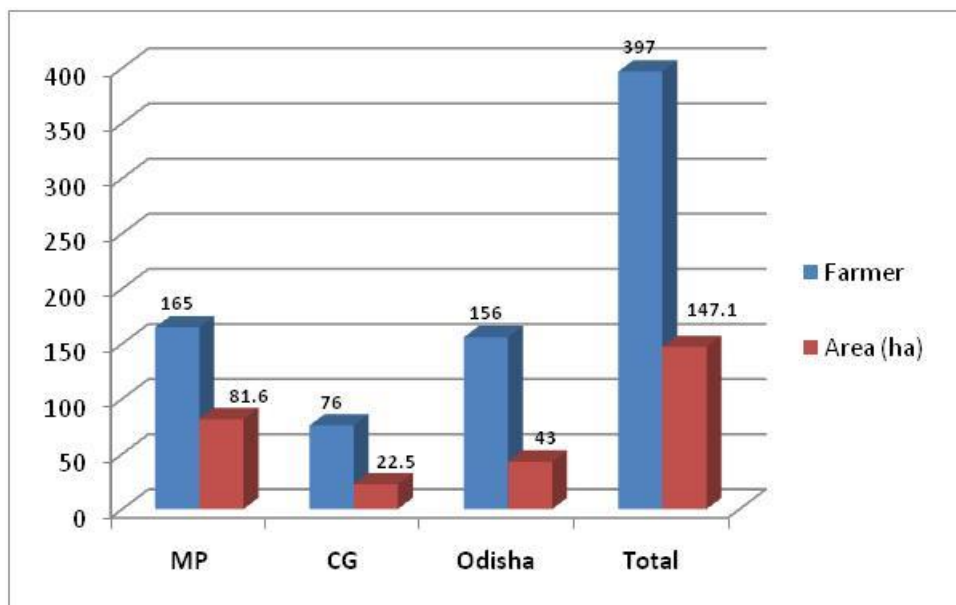


Fig.-3.1 State- wise varietal demonstrations of Cereal crops

ratio 1.92. Demonstration of temperature tolerant wheat variety RVW-4106 performed in 4 ha area by which total 10 farmers were benefited. Due to high temperature in February and March, the farmer variety yielded low due to temperature increase and small size of grain (shriveled seed) but RVW-4106 performed well. This variety performed 26.4 percent more yield than local variety, where net return Rs.30435 found in demonstration area and the BC ratio of this demonstration found 2.01. The short duration variety of Barley JB-58 and wheat HI-8663 performed in 12.8ha area involving 32 farmers. The high yielding crop variety JM-216 and hybrid maize demonstrated in 27.6 ha area and benefited the 19 farmer the BC ratio of the demonstration was recorded 3.50 over farmer crop varieties (BC ratio- 2.08).

Under this intervention, 17 demonstration total 76 farmers were benefited by covering the area of 22.5 ha in Chhattisgarh 76.



Demonstration of drought tolerant variety of wheat (HI-1531) and Hybrid Maize

Two KVKs were involved in drought tolerant paddy demonstrations with varieties Indira Barani Dhan-1, Indira maheshwari, Indira Rajeshwari, Sahbhagi and MTU 1010 laid out in 19.5 ha of area. These varieties yielded approx 30% more than farmer varieties, through intervention total 66 farmers were benefited. Similarly the drought resistant wheat variety laid out in 1.2 ha area and resulted 20% more yield than farmer variety. Under drought situation the farmer ragi variety yielded 2q/ha where the drought resistant improved variety Indira Ragi-1 resulted 10% more yield.

Through this intervention on cereal crops in Odisha benefited the total 156 farmers seven demonstration laid out in 43 ha of area. In this intervention short duration drought tolerant varieties Sahabhagi dhan and Jogesh performed in 28 ha of land including the 111 farmers and resulted the 19% more yield the farmers variety. The net income of both varieties was found Rs.23615 and Rs.17240 Sahabhagi dhan Jogesh respectively. In demonstration of flood tolerant Paddy var. Swarna sub-1 resulted 44q/ ha yield over farmer variety i.e. recorded 40 q/ ha under low land flooded condition.



Demonstration of drought tolerant varieties of Paddy



The high yielding Maize variety- PAC 745 demonstrated in five ha area which benefited the 25 farmers. Where the local variety yielded 11.7q/ ha the demonstration variety

Demonstration of pulses crops: In Madhya Pradesh, five pulse crops black gram, chickpea, green gram, pigeon pea and Lentil varieties were laid out in 69.6 ha area and benefited the 258 farmers through different objective like drought tolerant, heat tolerant and disease tolerance of varieties. Black gram demonstration with improve varieties TAU-2, JU 86, Shekhar-2, PU-35, RBU-38, Azad-1 and IPU-94-1 laidout in 34.4 ha of area involving 96 famers. Net income Rs. 17158.94 were found in demonstration with yield of 6 q/ha and 2.45 BC ratio. Similarly in green gram, the varieties TJM-3, Ganga-8, TM -37, and Samrat yielded the 7.29 q/ha over local with BC ration of 3.06, by which total 57 farmers benefited through demonstration laid out in 10.8 ha area.

In Chick pea drought & thermo tolerant varieties JAKI-9218 and JG 130 and short duration variety RSG-945 were demonstrated in 45.8 ha area involving 62 farmers. Similarly the short duration varieties TJT-501, ICPL-88039, PUSA 991, PUSA-992 PUSA- 2001 and UPAS-120 of Pigeon pea were laid out in 135 ha and by which 90 farmers. The average yield of demonstrated varieties were recorded 14.26 q/ha. The major objective of this intervention was to introduce frost escaping and short duration variety of pigeon pea. Drought resistant lentil variety introduction in farmer field and replace the farmer variety lid out in two ha area involving five farmers.

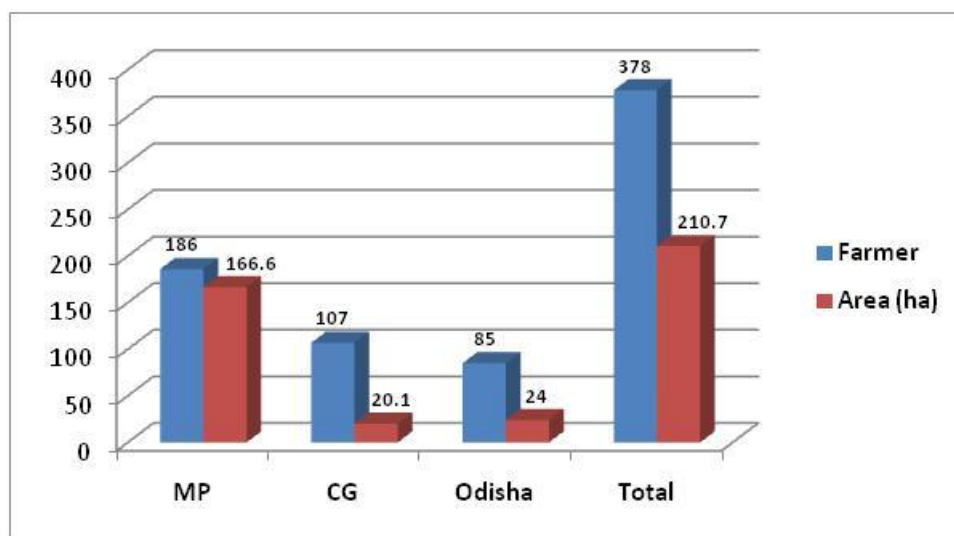


Fig.-3.2 State- wise varietal demonstrations of Pulse crops



In Chhattisgarh short duration variety TAU-2 laid out in 2.5 ha area involving eight farmers. This variety yielded 8.25 q/ha over local variety with BC ratio 2.57. Similarly in Chick pea drought & thermo tolerant variety JAKI-9218 was demonstrated in 1.6 ha area involving four farmers. SML-668 variety of green gram variety laid out in three ha area involving six farmers. The BC ratio of the chickpea and green gram were 2.2 and 2.71 respectively.

The field pea (Shubra) and green gram (HUM-16) laid out in 10 ha area by involving the 31 farmers. Through these demonstrations total 16.54% and 29.5% yield increased respectively.



Demonstration of Chickpea

Under three demonstrations in Odisha, Prasad variety laid out in 24 ha involving 85 farmers and 21.73% yield increase.

Demonstration on oilseed crops: Demonstration of oil seed crops of mustard, soybean, groundnut and sesame were conducted in an area of 183.2 ha with participation of 322 farmers under different vulnerability situations in Madhya Pradesh.

The soybean varieties JS 95-60, JS 93-05 (short duration varieties) and JS-335 were taken in 35.4 ha. of land involving 106 farmers of the NICRA village. This intervention resulted in returns of 2.53 BC ratio. JS 95-60 and JS 93-05 varieties are drought tolerant and short duration and performed better in stress condition. Total 12 ha of area covered with groundnut improved varieties TG- 37-A for drought tolerance under low rainfall condition involving 30 farmers.

The demonstration resulted in higher yield in mustard (17.44 q/ha) in improved varieties Rohini, NRCHB- 101, Pusa Tarak and RH-749 with BC ratio of 3.18.

This intervention covered 85.6 ha of land involving 116 farmers.

In sesame demonstration laid out in 17.2 ha area the demo yield was found 8.27q/ha over local practice (3.75q/ha). TKG-55, TKG-306 and JTS-21 variety resulted the Rs 13089.25 net return with 1.89 BC ratio.



Demonstration of Sesame var. TKG-306

In Odisha Sesame variety Prachi demonstrated in 2.5 ha involving 15 farmers. The Rs 10200 net return with 2.13 BC ratio.

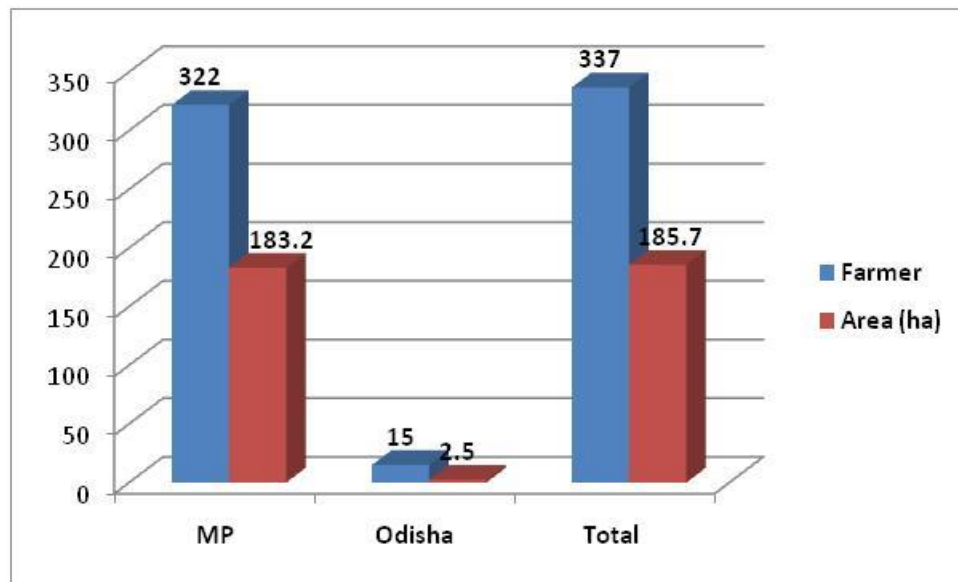


Fig.-3.3 State- wise varietal demonstrations of oilseed crops

Demonstration of horticultural crops: For utilization of unused pond and generate additional income generation, the new crop water chestnut introduced in area and laid out in one ha area involving five farmers in Madhya Pradesh.

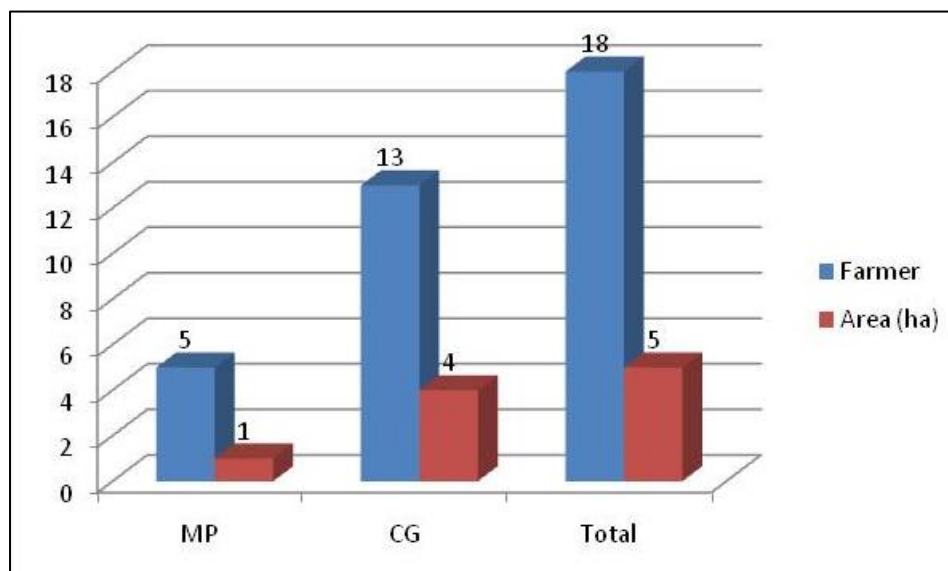


Fig.-3.4 State- wise varietal demonstrations of horticultural crops

In Chhattisgarh, demonstration of Brinjal var. Arka Keshaw organized in 2.5 ha of area involving seven farmers resulted BC ratio 3.67 by net return Rs.104000 Similarly in cowpea



variety Indira Barbati lal demonstrated in one ha area and gave net return of Rs 132850.00 by yielding of 39.4q/ha.

Demonstration on tomato varieties Arka Rakshak laid out in 1.2 ha involving six farmers, resulted yield of 351q /ha with BC ratio 3.67.

3.2 Advancement of planting dates of rabi crops in areas with terminal heat stress

Advancement of planting dates of rabi crops and terminal heat stress varieties were selected for different location of cereal, pulses, oilseed and horticultural crops were taken for frost escaping and reduce the temperature increase losses in February and March. Total 92.4 ha involving 255 farmers were covered in Zone VII under this intervention. In Madhya Pradesh, 77 farmers benefited by 65 ha area demonstration followed by Chhattisgarh were demonstration laid out in 6.4 ha area involving 16 farmers. 162 farmers were benefited by 21 ha area demonstration in Odisha.

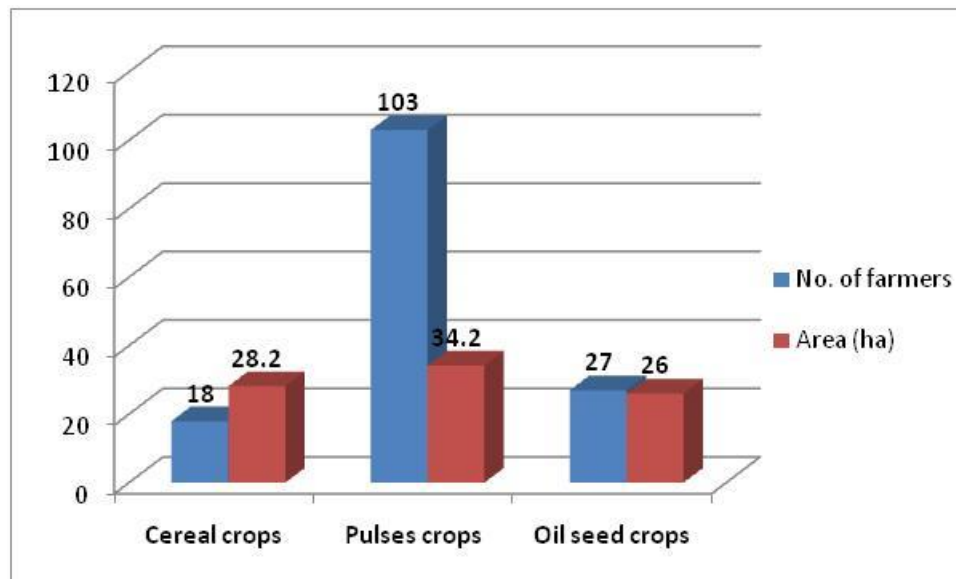


Fig.-35 Crop category wise advance planting date of sowing demonstrations

Advancement of planting dates of rabi crops in areas with terminal heat stress in cereal crops:

Under this intervention heat tolerant varieties RVW-4106 and JW-3211 introduced in NICRA villages to address the major problem in wheat particularly in Buldhelkahnd and Gird region i.e. sudden temperature increase in the month of February and March. These varieties performed well over local verities.



Under limited irrigation condition, JW- 3211 yield resulted in 15.1 q over farmer variety. Three irrigation given in both demonstration and farmer variety and JW-3211 performed well. This variety also showed bold grain, long ear and resistant to lodging. Total five farmers involved in this demonstration laid out in two ha area.

For reducing the sudden increase of temperature effect, the wheat variety RVW-4106 demonstrated in 25 ha involving 10 farmers, which resulted 7% more production over farmer practice. Demonstration result shows earliness of the variety, this variety matured in 110 days (early) in comparison to local variety 135 days taken for maturity.

In Chhattisgarh, condition for using soil moisture and for early maturity, conducted in 1.2 ha and benefited three farmers.. This variety resulted in 3.09 BC ratio with Rs.23785 net return.

Advancement of planting dates of rabi crops in areas with terminal heat stress in pulses:

The demonstration of drought and thermo tolerant early var. of chick pea of gram JG-16, JG-11 and JG-14 conducted in 11 ha and benefited 30 farmers in Madhya Pradesh. The demonstration observed that these varieties performed well under stress condition as compared to local varieties yield low under advancement of planting dates of rabi crops and terminal heat stress demonstration JG-16 were yielded 50% more than farmer variety, similarly gram variety JG-11 and JG- 14 resulted 40.68 % more yield.

In Chhattisgarh region, short duration chick pea JG-14 taken under this intervention which resulted the early maturity. The variety gave 3.5q/ha more yield than local variety.

Similarly in Odisha, TARM-1 and early maturity variety were demonstrated in 15 ha area involving 45 farmer, which resulted 10.52 percent yield increase with 2.2 BC ratio. Other than yield, character to early maturity characters of varieties.

Black gram improved variety demonstrated in two ha area involving the 10 farmers, which resulted Rs. 15080 net return with BC ratio 2.01.

Advancement of planting dates of rabi crops in areas with terminal heat stress in oilseed crops:

In Madhya Pradesh under this intervention mustard varieties Rohani, NRCDR-2 and Laxmi demonstration was taken for early sowing in 26 ha area involving 27 farmers. The demonstration showed the mustard variety NRCDR-2 was taken 15 days less time to maturity than farmer varieties and yielded 5.1 q/ha. For timely sown condition Rohni and Laxmi varieties early maturing varieties were demonstrated with local varieties.



Short duration linseed variety Kartika was demonstrated in one ha of land and benefited the five farmers. This variety was matured in 114 DAS over local varieties which taken 125 day for maturity.



Demonstration of short duration variety of linseed Kartika

3.3 Water saving paddy cultivation methods (SRI, aerobic, direct seeding)

Water saving direct seedling: Total 37.2 ha area covered under the water saving paddy cultivation method in direct seeding paddy involving 95 farmers. Variety like PB-1509, Sahbhagi, MTU-1010 and Mahamaya were demonstrated take under direct seeding to save input cost on labour and also in low rainfall condition.



Demonstration of DSR method of Paddy sowing in adopted NICRA Village

Water saving through SRI

SRI method is very useful under low rainfall condition and also required less water than traditional transplanting method. Variety MTU- 1010 and Shabhagi varieties demonstrations were conducted in seven ha area involving the 15 farmers, the result show that MTU- 1010 variety with SRI method had highest BC ratio 3.60.



Systematic rice intensification demonstration in field



3.4 Frost management

Under this intervention technical help was provided to farmers for prevent the crop from frost by Tikamgarh KVK. Similarly mustard variety NRCHB- 101 and RH-749 demonstrated in 50 ha area in KVK Morena, where the crop managed through different physiological methods like smoking and irrigation . Through these practices around 13% of yield loss were saved.

3.5 Community nurseries for delayed monsoon

In Madhya Pradesh, under community nurseries of delayed paddy nursery covered 2.4 ha area involving six farmers. Similarly hybrid paddy demonstration was laid out in 2.4 ha involving six farmers.

Under this intervention, six ha area covered in Chhattisgarh covering 20 farmers in paddy nursery under variety Indira Maheshwari. Tomato variety-Laxmi 5005 was demonstrated under horticulture community nursery programme in 2.5ha area involving nine farmer .

Similarly in Odisha, paddy nursery raising involving the 77 farmers with covering 7.2 ha of land.



Community nurseries of vegetables for delayed monsoon

3.6 Custom hiring centers for timely planting

In this intervention in Madhya Pradesh total three KVKs worked on custom hiring centre for timely planting and total 164 farmer were benefited by 13 demonstration in 241 ha and in Chhattisgarh 358 farmers benefited through covering 75.6 ha area. Similarly in Odisha, total 118 ha covered through custom hiring centers which benefited the 312 farmers directly.

Under this intervention, use in zero till seed drill sowing method covered total 101 ha of land involving the 45 farmers. By using seed cum fertilizer drill, total 43.6 ha of area covered



involving the 210 farmers through the reducing the input cost and time and yielded 44% more than traditional practices.

Other implements used by 555 farmers for 260 ha of land. These demonstrations directly benefited the small and marginal farmers by timely operation.

3.7 Location specific intercropping systems with high sustainable yield index

Under location specific intercropping systems Paddy + Pigeon pea+ Colocasia crops taken as mix-cropping involving the two farmers and covering one ha of land give net return Rs 64890 with 3.3 BC ratio. The Pigeon pea and colocasia were sown on bunds.

Similarly the Pigeon pea crop growing with Maize, Cotton and Paddy laid out in 56 ha involving 78 farmers. Pigeon pea with Maize resulted 28.66% more yield then sole crop practice, similarly Cotton + Pigeon pea gave 19.54% more yield and Pigeon pea + Paddy yielded 23.53% more net return then solo crop i.e. farmer practice.

Sustainable production under aberrant weather condition and controlling the pod borer of chickpea, the chickpea + coriander grown in ratio of 1:2, laid out in 4.2 ha of land and involving 12 farmers. Similarly the chickpea (JG-14)+ safflower (JSI-7) laid out in 5.2 ha involving the 13 famers.

Demonstration of intercropping systems of cotton + maize in 2:1 ratio covered two ha of area involving five farmers, resulted the 36% more yield the reduce the crop failure risk. Similarly, soybean crop taken with hybrid Maize in ratio 4:2.

In another demonstrations on wheat varieties (JG - 11, JG - 16 and JAKI - 9218) taken with mustard, under Intercropping system wheat (MP 1203) + mustard (C.G.Sarson) laid in 4 ha area involving 10 farmers. The demonstration shows Rs 13200 net return.



Intercropping of Chickpea + Coriander



Intercropping systems Paddy + Pigeon pea+ Colocasia



3.8 Others intervention

Under the crop production module, total 37 demonstrations were conducted in NICRA villages. In Zone VII, Total 464 farmers involved under 99.8 ha. In Madhya Pradesh, 158 farmer were benefited by 49.2 ha demonstration in CG total 16.4 ha demonstration were laid out in which 56 farmers were involved. Similarly 250 farmers of Odisha were benefited through 34.2 ha of demonstration

Different crop seeds were provided to farmers, 24 demonstration were conducted in 43.4 ha of land involving the 239 farmers in seven NICRA KVKs.



4. LIVESTOCK AND FISHERIES

The climate change would affect particularly the economics of the rural areas where people are more dependent on livestock, fisheries and agriculture related activities for their livelihoods (IFAD, 2009). It has been studied by the global scientists that already global temperature increased from 1.0 to 1.5°C within the last 30-50 years and it is under prediction that the global average temperature may be raised up to 4.0°C by this century (IFAD, 2010). This prediction reflects that in the future 20-30% plant and animal species will be endangered and will turn into extreme consequences for insecurity among the developing countries (Source-FAO, 2007).

The expected impact of climate change are to exacerbate the vulnerability of livestock systems and to reinforce existing factors that are simultaneously affecting livestock production systems such as rapid population and economic growth, increased demand for food (including livestock) and products, increased conflict over scarce resources (i.e. land tenure, water, biofuels, etc). For rural communities losing livestock assets might lead to the collapse into chronic poverty with long-term effects on their livelihoods.

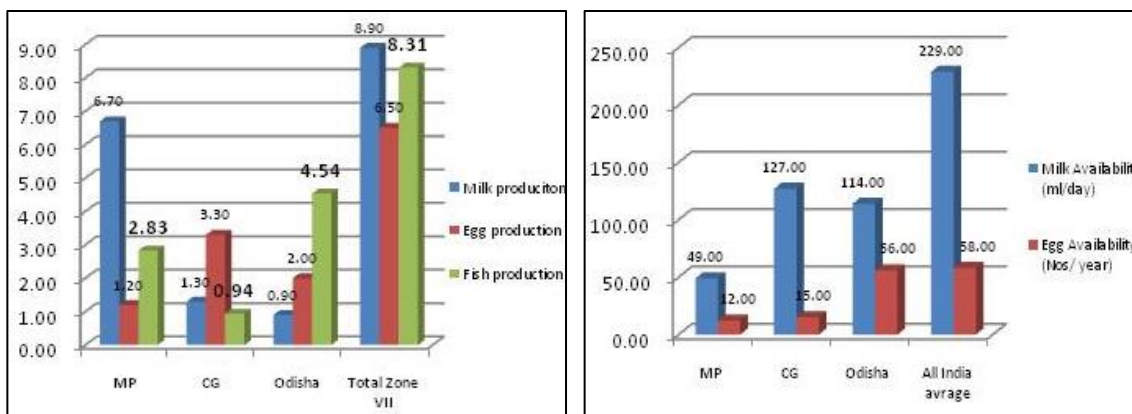


Fig.4.1 Percent of share in milk, egg and fish production

Fig.4.1 State-wise milk and egg availability

Demonstration of fodder production, de-worming, preventive vaccination, and management of fish pond / during, water scarcity and excess water, breed up - gradation and nutrient supplement management conducted in an area of 35.42 ha are by involving 1554 farmers and 8372 animal, 800 birds on specific interventions in adopted NICRA villages under ATARI, Jabalpur.



Salient achievements

- Total 467 farmers were involved in fodder/feed storage methods demonstrations conducted on 8.8 ha improved and covered 4746 animals.
- Total 3626 animals and 983 farmers were directly involved in preventive vaccination.
- Total 11 demonstrations conducted under Management of fish ponds / tanks during water scarcity and excess water.
- Total 800 animals benefited under improved shelters for reducing heat stress in livestock.
- Total 421 farmers directly involved under use of community lands for fodder production during droughts / floods and covered 13.6 ha.

4.1 Use of community lands for fodder production during droughts

Use of community land for fodder production during droughts intervention covered 12.4 ha of land in Madhya Pradesh involving the 56 farmers. Under this intervention, green fodder berseem, maize, and hybrid napier production taken on community land.

Table4.1: KVK wise technology demonstration under fish pond management

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Unit/ No. / Area (ha)	Measurable indicators of output*		% increase
					Demo	Local	
Balaghat	Barseem crop	BL-1	6	2.4	214.11	187	87.33
Morena	fodder production	Maize seed	20	5	13	11	18.1
Datia	Round the year Fodder production from cultivated land	Maize variety -J-1006	5	1	217.5	162.50 q/ha	33.84
Datia	Fodder production from non-cultivated land	Napier grass seed and Bajra Hybrid variety IGFRI-6	5	-	12	-	-
Guna	Use of community lands for fodder production during droughts	Green fodder rijka variety L L composite 3	20	4	186.9	134.2	39.27

4.2 Improved fodder/feed storage methods

Fodder production: Total seven demonstrations on fodder crops were laid out in an area of 86.1 ha by involving 159 farmers in Madhya Pradesh under different vulnerability situations. The BC of ratio was highest in berseem crop (3.41) and given highest net return (Rs. 72790) in per unit. In Odisha total 23 farmers were benefited through demonstration laid out in 1.4 ha area.



Fodder bank: Fodder collection and conservation technique, demonstrated in farmer’s field. A total of 26 farmers were benefited by 70 ha by-product i.e. wheat straw (460t) stored for of season three demonstrations in Madhya Pradesh.

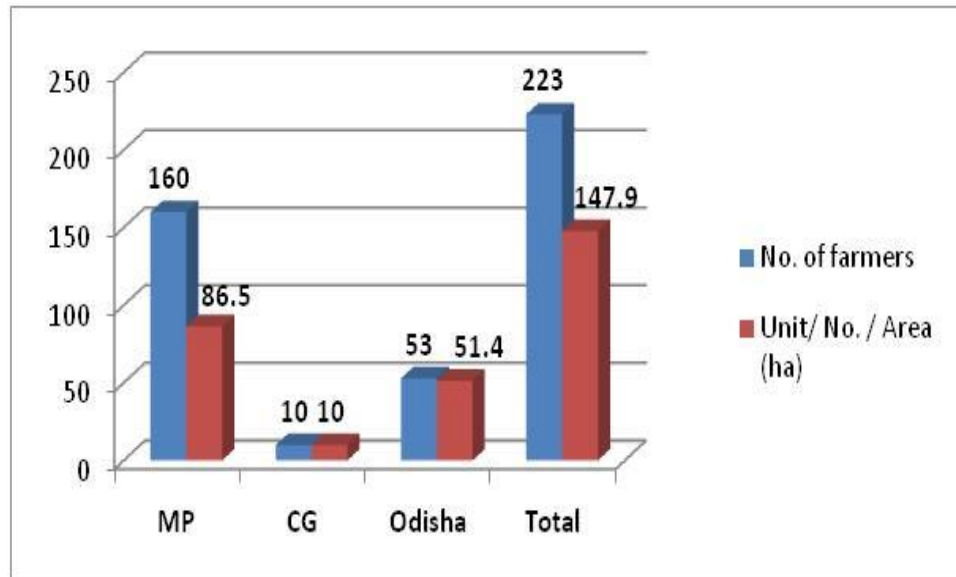


Fig.4.2 State - wise total fodder production and storage details

4.3 Preventive vaccination

In this module animal health camps, breed up-gradation, de-worming, feed management, fish management and vaccination were performed at farmer’s field. These demonstrations were benefited total 3842 animals and 1410 farmers those are directly involved in dairy and fish farming.

Preventive vaccination: Preventive vaccinations were given to 2126 animals and by these programme total 452 farmers benefited in Zone –VII.

In Madhya Pradesh, total 2240 animals were vaccinated for Foot and Mouth Disease (FMD) and Hemorrhagic septicemia (HS) by which 623 farmers benefited. Similarly one demonstration on vaccination was done and vitamin supplement was given to domestic animals performed in Odisha with involving the 886 animals of 218 farmers followed by Chhattisgarh were 305 animal and 52 farmers were benefited thorough prevention vaccination intervention.



Preventive vaccination practice in adopted NICRA villages

Animal health camp: In this intervention total six camps were organized in Zone -VII, in which two animal health camps organized in Madhya Pradesh. Total 290 animals were examined and the treatments were given as per the diagnostic results by which animals of 131 farmers benefited by these health camps. Similarly in Chhattisgarh 298 animals of 52 farmers were examined in animal health camps with District Veterinary Department of Chhattisgarh.

In Odisha, in two animal health camps, total 91 animals were examined and 81 farmers were benefited by these intervention.



Animal health Camp and deworming of animals

De-worming in animals: In six demonstrations de-worming were covered 413 animals of 100 farmers in Madhya Pradesh. Under this intervention, two demonstrations were performed, in which 163 animal of 63 farmers directly benefited in Chhattisgarh. For de-worming, animals treated with HITEK-bolus @ 2 bolus/animal/year and Fenbendazol @ 7.5mg /kg b.w.

Nutrient management: For increasing the production and productivity, it is necessary to provide balance diet to animals. To teach better nutrient management, one demonstration was conducted in Madhya Pradesh which covered 20 animals of 20 farmers. In Chhattisgarh, one demonstration was performed with involving 70 animals of 40 farmers. Under this intervention in Odisha, one demonstration was conducted.



4.4 Shelter and feed management:

In this intervention, farmers were trained for livestock and poultry management in summer and winter season by their shelter and feed management habits.

Livestock management: Under this intervention, one KVK performed the training on feeding and drinking water management and animal shelter preparation to prevent the animal from biotic and abiotic stress during summer and winter season, which benefited 57 farmers.

Poultry management:

In one demonstration in low cost brick structure for poultry shed directly benefited the 10 farmers and 500 birds. Through this intervention, production income of farmers were increased due to better management practices like feed, disease etc and the climatic effect also reduce in comparison of free type of poultry rearing.



Low cost brick structure for poultry shed

4.5 Breed up-gradation:

The breed up-gradation is very important part of animal husbandry and fishery. In Zone –VII total 329 farmers were directly benefited under this module.. In Madhya Pradesh, three KVKs conducted three demonstrations and benefited 200 farmers by replacing the low yielding local breed with Murrah breed. Similarly in Odisha and MP dual purpose breeds Black bengal and Jamunapari goat provided to farmers by which total 20 farmers were benefited. Kadaknath, Rainbow rooster, Banraja breed of poultry and Khakhi Campbell breed of duck provided to farmer to replace low yielding local breeds.



Goats for breed up gradation



Rainbow rooster, Banraja chicks for replace farmer's breeds



4.6 Management of Fish ponds

The demonstration on management of fish ponds/tanks during water scarcity and excess water condition were done in about 8.4 ha by involving 39 farmers. In Madhya Pradesh, total 1.6 ha area covered involving 9 farmers by in module. In three demonstrations, total 6.8 ha of land covered involving 30 farmers. The fish like rohu and katla were grown. The fish farming done in flood affected area and diversified farming provided additional income to farmers. Besides this, technical support also proved to those farmers which are already engaged in fish farming.



Technology demonstration of fish farming and pond management

Table5.2: KVK- wise technology demonstration under fish pond management

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Unit/ No. / Area (ha)	Measurable indicators of output* Survival % and yield		% increase
					Demo	Local	
Balaghat	Fish Pond	Feed	6	1			
Morena	Training Maintenance of fish ponds proper dose food ,grain and disease control of fish	Lime	2	0.2	9 0q /ha/year	70/q/ha/year	28.5
Guna	Fish farming	Rohu, Katla, Mrigala	1	0.4	5.00q.	3.65q	36.98
Ganjam-1	Stocking yearlings of Catla, Rohu and Mrigal @ 5000 nos/ha at a ratio of 3:4:3 with proper water quality management and feeding with floating fish feed @ 1% of body weight daily.	Yearling ,feed	3	03/1.2	Survivilit y-95% Yield-28 q/ha.	78% 19q/ha.	34 and 48
Kendapara	Demonstration of IMC & intercropping of middle carp	IMC & middle carp, feed, medicine	25	5	30.2	21.4	41.12
Sonepur	Stocking yearlings of Catla, Rohu and Mrigal @ 5000 nos/ha at a ratio of 3:4:3 with proper water quality management and feeding with floating fish feed @ 1% of body weight daily.	Yearling ,feed	2	0.6	Survivilit y-92% Yield- 31.00 q/ha.	73% 22.5 q/ha.	26.02 37.77



5. INSTITUTIONAL INTERVENTIONS

Institutional intervention module consists of institutional mechanism either by strengthening the existing ones or initiating new ones relating to seed bank, fodder bank, commodity groups, custom hiring centre, collective marketing group, introduction of weather index based insurance, literacy through a village weather station, etc..

Salient achievements

- Climate literacy benefitted total 319 farmers using village level weather station
- Collective marketing benefitted total 197 farmers.
- A total of 77 farmers and 7 SHGs were benefitted under Commodity groups
- Using Fodder bank total 428 farmers were benefitted
- Seed bank benefitted total 935 farmers.

5.1 Seed Bank

In seed bank intervention, in Madhya Pradesh total 512 farmers covered and produced 2711q seed in 13 demonstrations on different crops. Under soybean seed production, 160 farmers produced 436 q seed, the wheat covered a group of 72 farmers and they produced 924 q seed and other crops (pigeon pea, black gram, barley, green gram, etc.) covered 175 farmers and produced the 375q seeds. It observed that these practices improved the farmers income and make seed availability easy to other farmers of the village also. In Odisha, total three demonstrations conducted under participatory seed production program on paddy and black gram production and storage of 92 q seed involving 243 farmers and in Chhattisgarh Bilaspur KVK produce the 180q paddy seed by involving the 20 farmer.



Seed storage under seed bank intervention

5.2 Fodder Bank

Under this intervention, total 9806 q straw were stored in proper manner involving 31 farmers, resulting feed available in off-season and per animal milk production increase in summer season.

Similarly, in high yielding berseem production demonstration covered 50 farmers and total 1000 q fodder production taken for feed availability.



Demonstration of Hay preparation and scientific storage method of fodder

5.3 Commodity Groups

In this intervention, village climate risk management committee (VCRMC), community development, poultry and goat distribution to improve the socio-economic condition of farmers and to provide training to other farmers. Total 60 farmers and seven SHGs directly benefited by different demonstrations in Zone VII to facilitate in maintenances climate vulnerability, seed, implement, fertilizers and other document and direct market linkage with the traders.

5.4 Collective marketing

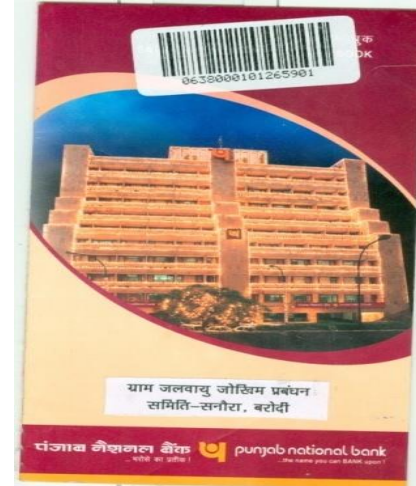
Through collective marketing system related KVKs motivated farmers for collection of commodity and directly approach to *mandi* or marketing place where they get better paddy instead of individual selling of commodity. Under this intervention module, total 160 farmers were participated in with more than 784.0 q of different crop commodities.

5.5 Climate literacy programmes

To overcome the vulnerabilities in relation to climate, technical awareness development programmes including different improve production technologies with proper guideline and provided weather information to farmers through automatic weather station and ZARS of district. Total 370 farmers in Madhya Pradesh and 42 farmers in Odisha were benefited through Climate literacy programmes.



Village level technical awareness development programmes



Demonstration of Ambika paddy weeder under custom Hiring Center

जमा की गई रकम CR Amount	शेष जमा राशि Balance
2,500.00	2,500.00 Cr
2,935.00	5,435.00 Cr
3,100.00	8,535.00 Cr ✓
300.00	8,835.00 Cr
3,000.00	11,835.00 Cr ✓
2000.00	13835.00 C
200.00	14035.00 C
168.00	14203.00 C
12000.00	26203.00 C
2100.00	28303.00 C
1200.00	29503.00 C
476.00	29979.00 C
3000.00	32979.00 C ✓

Village climate risk management committee management



6. CAPACITY BUILDING PROGRAMME

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 latest knowledge and skill could be maintained in the KVKs. In total, 302 courses benefitted 8900 participants including farmers, farm women and rural youth. These training not only improved the technical skill but it is also useful income generation, resource conservation technology, climate awareness etc. in farmer level.

Title of the programme	Courses (No.)	Beneficiaries (No.)		
		Male	Female	Total
Natural resource management	45	1326	227	1553
Resource conservation technologies	20	562	78	640
Crop diversification	20	524	75	599
Crop management	38	753	140	893
Nursery raising	10	228	63	291
Nutrient management	24	524	156	680
Pest and disease management	33	748	144	892
Weed management	14	305	48	353
Livestock management	32	781	303	1084
Fodder and feed management	16	406	103	509
Farm implements and machineries	12	311	42	353
Value addition	7	50	123	173
Employment generation	5	121	30	151
Vermi-compost	17	383	140	523
Home science	9	0	206	206
	302	7022	1878	8900



Photographs of Capacity building programmes under NICRA



Vermicompost pit preparation



Framers training on Zero seed drill



IPM mondal



Crop management training for drought



Nutrient management training



Training programme



Training on NRM



Vermicompost production training



Vermicompost production training



Framer training on custom hiring center



Training and distribution of chicks



Seed and fertilizer distribution

7. Extension Activities



In order to create awareness among the farmers, total 752 extension activities were organized by KVK at the farmer's fields. A total of 10914 farmers benefited through these activities out of which 963 farmers by field day, 215 farmers by capacity building programme, 240 farmers by animal health camp, 1179 farmers by agro advisory services, 510 farmers by method demonstration, 284 farmers by Scientist -farmers interaction & 369 farmers benefited through kisan mela and Krashak sangosthi in during the year 2015-16.

Thematic area	No. of activity	Beneficiaries (No.)		
		Male	Female	Total
Method demonstrations	54	737	226	963
Agro-advisory services	346	2976	285	3261
Awareness campaigns	41	1659	461	2120
Exposure visits	34	464	94	558
Field day	35	838	268	1106
Group discussion	110	1282	422	1704
Diagnostic .visit	132	927	275	1202
	752	8883	2031	10914



Method demonstration Mushroom production



Animal health camp



Exposure visit



Awareness campaigns



Soil testing campaigning



Animal health camp

8. Status of custom hiring centers



a. Summery

S. No.	Name of KVK	Area covered	Farmers benefited (No.)	Revenue generated
1	Balaghat	--	--	--
2	Chhattarpur	--	--	--
3	Tikamgarh	761	470	--
4	Datia	449.4	221	18500
5	Morena	439.1	1011	104795
6	Guna	40	95	8800
7	Jhaua	--	--	--
8	Satna	57.6	115	29975
9	Ratlam	--	--	--
10	Bhatapara	23.21	33	9300
11	Dantewada	109.5	608	53810.0
12	Bilaspur	--	--	--
13	Ganjam-1	112	46	6360
14	Jharsuguda	68.2	397	83117
15	Kendrapara	82	140	9100
16	Sonepur	70.5	139	22150
17	Kalahandi	--	--	--

b. KVK wise details of custom hiring centers

1. Datia

S.No.	Name of Implement	Area covered (ha)	Farmers benefited (No.)	Revenue generated (Rs.)
1	MB Plough	74.40	41	1880
2	Leveler	69.00	54	1360
3	Disc harrow	86.50	51	4820
4	Rotavator	70.00	27	1340
5	Seed cum fertilizer drill	135.00	27	4450
6	Multi crop thresher	14.50	21	4650
	Total	449.4	221	18500

Guna



S.No.	Name of implements	Area covered (ha)	Farmers benefited (No.)	Revenue generated (Rs.)
1	MB Plough	20	20	1000
2	Seed cum fertilizer drill	10	10	1500
3	Rotavater	10.0	10	1500
4	Reaper	10.00	1500	10
5	Hand wheel hoe	20.0	200	20
6	Sprinkler set	5.0	100	05
7	Power sprayer	20.00	3000	20
	Total	95	8800	95

2. Morena

S. No.	Name of implements	Area covered(ha)	Farmers benefited (No.)	Revenue Generated (Rs.)
1.	Zero till seed drill	85	250	10795
2.	Seed cum fertilizer drill	32	170	3000
3.	Tractor drawn bed planter	85	120	5000
4.	Multi crop turbo seeder	25	25	2500
5.	Tractor drawn land leveller	35	22	2500
6.	Disc plough	25	45	1200
7.	Tractor drawn disk harrow	25	40	1800
8.	High power sprayer	2.1	24	1000
9.	Power sprayer cum duster	15	140	1800
10.	Hand sprayer	15	40	1200
11.	Seed treated drum	-	35	500
12.	Seed cum fertilizer drill with raised bed furrow system	70	65	70000
13.	Reaper	25	35	3500
		439.1	1011	104795

3. Bhatapata

S. No.	Name of implements	Area covered (ha)	Farmers benefited (No.)	Revenue Generated (Rs.)
1	Sprinkler Set	03	4	600
2	HDPE Pipe	15	22	5380
3	Seed cum fertilizer drill	-	2	1050
4	Multicrop Thresher	2	2	250
5	Leveller	1.21	1	100
6	Sprayer	2	2	120
	Total	23.21	33	7500+1800 = 9300

4. Dantewada

S. No.	Name of implements	Area covered	Farmers benefited	Revenue Generated
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		(ha)	(No.)	(Rs.)
1.	Seed cum fertilizer drill	08	76	3800
2.	Hymetic power operated sprayer cum duster	04	23	1400
3.	Botliboi Diesel Pump (5HP)	05	12	1800
4.	Sprinkler set (7 Nozzle)	04	22	3000
5.	Tractor drawn rotavator	06	38	3200
6.	Tractor drawn 1 and leveller	05	31	1300
7.	Chap Cutter	-	29	1000
8.	Bull Drawn Seed Drill	02	21	850
9.	Cycle wheel hoe	03	45	950
10.	Tractor drawn thresher	36	120	24642
11.	Motor drawn reaper	21.5	56	7100
12.	Tractor drawn cultivator	11	79	3700
13.	Hand operated paddy weeder	04	56	1068
Total		109.5	608	53810.0

5. Jharsuguda

S. No.	Name of implements	Area covered (ha)	Farmers benefited (No.)	Revenue Generated (Rs.)
1	Power tiller	27.8	157	56625
2	Paddy reaper	17.4	63	22352
3	Hand winnower	--	42	840
4	Paddy thresher (manual)	--	37	740
5.	Manual sprayer	17	88	1760
6.	Power weeder	2	4	200
7.	Sprinkler set	2	2	400
8.	Power sprayer	2	4	200
Total		68.2	397	83117

6. Kendrapara

S.No	Name of Implement	Area covered (ha)	Farmers benefited (No.)	Revenue generated through CHCs (Rs.)
1	Power tiller	25	40	8000
2	Power sprayer	15	25	350
3	Diesel water pump set (3HP)	10	30	300
4	Diesel water pump set (3.5 HP)	20	20	250
5	Napsack sprayer	12	25	200
		82	140	9100

7. Sonepur



S.No	Name of Implement	Area covered (ha)	Farmers benefited (No.)	Revenue generated through CHCs (Rs.)
1	Tractor drawn land leveler	9	29	2700
2	Tractor drawn M.B. Plough (2 Bottom)	6.5	9	1750
3	Tractor drawn rotavator	11	27	5500
4	Self-propelled riding type reaper	16	31	8000
5	Diesel pump set	14	22	2800
6	Knapsack sprayer	14	21	1400
	Total	70.5	139	22150

8. Satna

S.No	Name of Implement	Area covered (ha)	Farmers benefited (No.)	Revenue generated through CHCs (Rs.)
1	M.B.Plough	10	20	5000
2	Seed cum fertilizer drill	14.20	30	6550
3	Rotovator	0	0	0
4	Cultivator	24.60	55	15325
5	Harrow	8.80	10	3100
	Total	57.6	115	29975

9. Tikamgarh

S.No	Name of Implement	Area covered (ha)	Farmers benefited (No.)	Revenue generated through CHCs (Rs.)
1	Sprinklers set	68	105	
2	Wheal hoe	24	45	
3	Cheff cutter	15	24	
4	Reaper	30	34	
5	M.B. Plough	69	234	
6	Rotavetar	26	34	
7	Sprayer	40	49	
8	Seed- cum-ferti-drill	94	158	
9	Ridge bed planter	104	78	

10 .Ganjam





S.No	Name of Implement	Area covered (ha)	Farmers benefited (No.)	Revenue generated through CHCs (Rs.)
1	Sprayer	23	08	880
2	Power tiller	64	27	4320
3	Rotary tiller	16	04	600
4	Pump set(diesel)	09	07	560
	Total	112	46	6360

Monitoring of NICRA Projects

Name of KVK	Name of NICRA Village	Name & designation of visitors	Date of visit
Tikamgarh	Kanti	Dr. Ahi Haran, JICA scientist,	26.07.2016
Ratlam	Amba	Dr. J. V. N. S. Prasad, Co- PI TDC- NICRA, CRIDA- Hyderabad	23.12.2015
Ratlam	Amba	Dr. S. R. K Singh Principal Scientist (AE) I/C NICRA, ICAR- ATARI Zone-VII, Jabalpur	23.12.2015
Dantewada	Hiranar	Shri Guha Ram Ajgale Board Member, IGKV, Raipur Dr. D. S. Thakur, Dean, College of Horticulture & Research Station Jagadapur, Dr. S. C. Yadav, Asst. Prof. S.G. CARS, Jagdalpur, Dr. Ratna Nashine Asst. Prof., Pt. K.L.S., CoH Rajnandgaon	11 .09.2015
Kalahandi	Pipalpada	Dr. Subash Chandra Mohapatra, Joint Director, DEE, OUAT,	22.12.2015
Kalahandi	Pipalpada	Dr. Subash Chandra Mohapatra, Joint Director, DEE, OUAT,	20.01.2016
Kalahandi	Pipalpada	Dr. S.R.K. Singh, Principal Scientist, ZPD VIII, ATARI, Jabalpur,	20.01.2016
Kalahandi	Pipalpada	Dr. R.K. Pattanaik, Associate Dean, COA, Bhawanipatna	13.02.2016
Kalahandi	Pipalpada	Mr. Laxaman Kumar Palta Singh, DDA, Kalahandi	13.02.2016



HEAD-WISE REVISED BUDGET SANCTION FOR 2015-16



(Rupees in lakhs)

S No	Name of the ZPD/KVK	Operational expenses (Labour, skilled staff, POL, Supplies etc.,) Contractual Services including RA/SRF etc.	TA	Total RC	NRC	Total	Expenditure
1	ATARI, Zone-VII, Jabalpur	8.00	1.50	9.50	2.00	11.50	10.97316
2	Balaghat	6.25	0.50	6.75	4.25	11.00	3.66955
3	Bilaspur	6.00	0.50	6.50	4.25	10.75	10.41284
4	Chhatapur	2.00	0.50	2.50	4.25	6.75	430660
5	Dantewada	7.00	0.75	7.75	4.25	12.00	11.5000
6	Datia	9.00	0.75	9.75	5.25	15.00	14.82755
7	Ganjam	5.50	0.50	6.00	4.25	10.25	9.68265
8	Guna	6.30	0.75	7.05	4.25	11.30	9.66208
9	Jharsugda	6.00	0.75	6.75	4.25	11.00	5.92000
10	Kendrapara	6.00	0.75	6.75	5.25	12.00	5.66509
11	Morena	7.50	0.75	8.25	4.25	12.50	11.66042
12	Raipur	6.95	0.75	7.70	4.25	11.95	15.75000
13	Satna	9.50	0.75	10.25	5.25	15.50	12.31198
14	Sonepur	5.50	0.50	6.00	4.25	10.25	9.60200
15	Tikamgarh	2.00	0.50	2.50	4.25	6.75	3.57999
16	Ratlam (NEW KVK)	8.00	0.75	8.75	7.00	15.75	13.30398
17	Jhabua (NEW KVK)	8.00	0.75	8.75	7.00	15.75	15.75000
18	Kalahandi (NEW KVK)	8.00	0.75	8.75	7.00	15.75	8.31972
	Total	117.50	12.75	130.25	85.50	215.75	176.8976



Appendix- 1

Table1. KVKs wise Introducing flood / drought / temperature tolerant varieties details

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
Tikamgarh	Low water requirement crop (kharif) Sesame	TKG 308	10	5	6.77	8.1	9000	68850	60350	8.1
Tikamgarh	Low water requirement crop (Rabi) Mustard	Rohani	30	20	12.36	16.94	14200	44912	30712	3.1
Balaghat	Paddy	MTU-1010	10	4	58.5	39.6	24800	82485	57685	3.3
Balaghat	Maize	JM-216	5	1	44.5	38.9	19200	55625	36425	2.8
Balaghat	Pigeon pea	TJT-501	10	1	14.2	9.4	21000	82360	61360	3.9
Chhattarpur	Soybean	JS-95-60	30	12	Crop failed due to drought					
Chhattarpur	Ground Nut	TG-37A	30	12	Crop failed due to drought					
Chhattarpur	Sesame	TKG-55	18	7.2	Crop failed due to drought					
Chhattarpur	Black Gram	Azad-1	6	2.4	Crop failed due to drought					
Chhattarpur	Barley	JB-58	25	10	Crop failed due to drought					
Chhattarpur	Wheat	JW-3020	10	4	Crop failed due to drought					
Morena	Replacement of Long duration Variety by short duration variety of Pigeon pea	ICPL-88039	10	25	18	16	32500	157200	124700	4.8
Morena	Replacement of Long duration Variety by	PUSA 991	10	25	17.5	15	32000	149900	115250	3.6



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
	short duration variety of Pigeon pea									
Morena	Replacement of Long duration Variety by short duration variety of Pigeon pea	PUSA 2001	10	25	16.2	14.2	31000	113400	82400	2.65
Morena	Replacement of Long duration Variety by short duration variety of Pigeon pea	UPAS-120	10	25	15.6	13.9	30000	133440	103440	3.4
Morena	Replacement of Long duration Variety by short duration variety of Pigeon pea	PUSA 992	10	25	15.5	14	30000	118700	88700	3.9
Morena	Drought resistant variety of Blackgram	Shekhar	5	2	8	7.5	19000	65800	46800	3.46
Morena	Early maturing Green gram variety suitable for rain fed conditions, yellow mosaic disease resistant	TJM-3	5	2	8.1	6.8	20000	67200	47200	3.36
Morena	high yielding Mustard , aphid tolerant suitable for rain fed condition	NRCHB- 101	10	25	21.4	19.3	22000	99300	77300	4.5



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
Morena	Evolution of relay cropping in mustard +bar seam suitable for drought condition and mordent resistant disease.	RH-749	10	25	22.6	19.8	22000	109700	87700	4.9
Morena	Wilt and heat tolerant Chickpea variety	JAKI-9218	10	25	22.3	19.8	30500	108010	87510	3.5
Morena	Replacement of low value crop (pearl millet) by high value crop (soybean)	JS-9560	10	25	16.8	14.6	29000	64980	35980	2.24
Morena	Replacement of low value crop (pearl millet) by high value crop (maize	Hybrid	10	25	13	11	21000	91000	70000	4.3
Morena	West pond used and economic generate by new crop water chestnut	Water Chestnut	5	1	20.5	15.5	15000	41000	26000	2.73
Datia	Short duration variety of Soybean	JS-9560	9	3.6	10.78	7.61	16400	40945	24545	2.23
Datia	Mustard in timely sown condition	RVM-2	15	3.6	18.12	14.78	19130	17668	51538	3.69
Datia	Temperature tolerant	Shekhar-2	7	1.6	5.04	3.5	15900	32778.57	16878.57	2.06



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
	variety of Black gram									
Datia	Temperature tolerant variety of sesame	TKG-306	7	1	4.65	2.55	14516	36270	21754	2.5
Datia	Temperature tolerant variety of wheat	RVW-4106	10	4	40.39	31.93	30150	60585	30435	2.01
Jhabua	Soybean-JS 9560	Seed, Nutrient, Insecticide	10	4	13.87	9.58	16800	48545	31745	2.89
Jhabua	Soybean- JS 9305	Seed, Nutrient, Insecticide	10	4	13.32	9.58	16800	46620	29820	2.78
Jhabua	Black gram -JU 86	Seed, Insecticide	8	3.2	3.44	2.25	9125	25800	16675	2.83
Jhabua	Wheat-HI 8663	Seed	7	2.8	18.44.	12.7	17680	29509	11829	1.67
Jhabua	Gram-JG 130	Seed, Insecticide	14	5.6	11.54	8.45	17695	47333	29638	2.67
Jhabua	Pigeon Pea-JKM 189	Seed, Insecticide	10	4	11.1	7.85	16350	83265	66915	5.09
Ratlam	Short Duration Variety	JS-9560	6	2.4	13.8		16600	49680	33080	2.99
Ratlam	Farmers practice	JS – 335	1	0.4		10.4	14200	37440	23240	2.63
Ratlam	Restricted Irrigation Variety of Wheat	HI-1531+RDF	12	4.8	37.4		24300	56100	31800	2.3
Ratlam	Farmers practice	Lok - 1	1	0.4		26.7	22600	40050	17450	1.77
Ratlam	Short duration and	Ganga-8	2	0.8	7.4		9240	53280	44040	5.76



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
	Heat tolerant variety of Green Gram									
Ratlam	High Yielding variety of Maize	Hybrid	4	1.6	42.1		17250	58940	41690	3.41
Ratlam	Drought resistant variety of Lentil	Lentil (Bold Seeded) Variety	5	2	10		11000	48000	37000	3.3
Ratlam	Varietal Chick Pea	RSG-945+RDF+Ne edbased pesticide	8	3.2	10.6		18600	40280	21680	2.16
Ratlam	Improved Variety of Summer Sesame	TKG-306	10	4	Data Awaited					
Ratlam	Short duration and YMV tolerant variety of Black Gram	RBU-38	6	2.4	6.2	10300	42160	31680	4.09	
satna	Introduced drought tolerant var. NRC-7 of soybean with rain fed Paddy crop	NRC-7, Seed treatment	12	4	6.29	3.71	24870	17612	-7258	0.71
satna	Crop substitution- rain fed paddy substituted with early maturing crop black gram	IPU-94-1, Seed treatment,	17	4	3.24	1.62	18100	12636	-5464	0.7



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
satna	Introduced early maturing crop i.e. Green gram	Samrat, Seed treatment ha, NPKS 20:50:20:20 bio fertilizer,	20	4	3.44	1.56	17930	15480	-2450	0.86
satna	Early maturing Drought escape var. of sesame	JTS-21, Seed treatment NPKS 60:40:20:20 Kg/ha, ,	25	5	3.54	1.85	15400	19824	4424	1.29
satna	Substituted frost escaping variety ICPL-88039 with long duration variety of Pigeon pea	ICPL-88039, organic manure spray with Imidacloprid @125 ml/ha	20	5	5.96	3.92	25640	30992	5352	1.21
satna	Introduced sole crop of mustard suitable for rain fed areas whereas traditionally farmers grew mixed crop of mustard	Pusa Tarak, organic manure 2 t/ha, @125ml/ha	51	12	13.4	9.2	14680	46900	32220	3.19
satna	Introduced low water requiring variety-JW-17 in place of traditionally grown variety WH-147	JW-17, organic manure 4t/	15	4	25.31	14.22	19870	44292.5	24422.5	2.23



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
satna	Introduced low water requiring crop barley variety-K508 in place of traditionally grown variety WH-147	K-508, organic manure	14	4	16.51	12.4	15470	22288.5	6818.5	1.44
Guna	BBF planting method in Soybean for in-situ moisture conservation and drainage	JS 95-60	30	12	10.03	6.44	17082	35102	18019	1.99
	Introducing of drought tolerant varieties Late sown and drought tolerant variety Sekhar 2	Shekhar 2	47	18.8	10.01	5.8	12042	40033	28060	3.22
	Introducing of short duration varieties High yield and yellow mosaic resistant variety TM 37	TM 37	30	4	10.23	8.61	12442	86955	74512	6.99
Guna	Introducing of short duration varieties Thermo Tolerant Wheat variety HI 1544 suitable for limited irrigation condition	HI 1544	30	12	44.3	34.1	22666	69207	46552	3.05



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
	Introducing of drought tolerant varieties rabi crop Drought & Thermo Tolerant variety of Gram JG - 130	JG 130	30	12	16.75	14.22	21880	53600	31470	2.45
Bilaspur	Line sowing & improved cultivation technique of Pigeon pea	ICPL-88039 & provide seed drill for line sowing.	50	2	7	100	15000	30100	15100	2
Bilaspur	Line sowing & improved cultivation technique of Moong bean	HUM 16 provide seed drill & Roravator for line sowing.	25	8	7.5	3	12000	34875	22875	2.9
Bilaspur	Line sowing & improved cultivation technique of chickpea	JAKI-9218 & provide seeddrill for line sowing & Roravator.	4	1.6	6	50	8500	19050	10550	2.2
Bilaspur	Improved Paddy cultivation	Indira Barani Dhan provide seeddrill for line sowing.	13	4	30	30.4	28110	42300	14190	1.5
Bilaspur	Improved Paddy variety cultivation	Indira maheshwari provide	20	6	32	45.4	27640	46400	18760	1.6



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
		seeddrill for line sowing .								
Bilaspur	Improved Paddy variety cultivation	Indira Rajeshwari, provide seeddrill for line sowing.	6	2	33	50	30110	47850	17740	1.5
Bhatapara	Drought tolerant variety of wheat-Ratan	Ratan, DAP 125 Kg per ha	3	1.2	22.7	20.2	11400	35185	23785	3.09
Dantewada	Rice (Sahbhagi)	Seed	10	2	30.26	23.59	19560	40379	20818	2.06
Dantewada	Rice (MTU 1010)	Seed	8	2	36.59	26.23	20550	51494	30944	2.5
Dantewada	Rice (Indira Barani Dhan-1)	Seed	9	3.5	29.5	24.5	14850	42380	27530	2.85
Dantewada	Ragi (Indira Ragi-1)	Seed	7	2	13.43	8.65	12574	27342	14768	2.17
Dantewada	Black Gram (TAU-2)	Seed	8	2.5	8.25	5.1	18970	48860	29890	2.57
Dantewada	Moong (SML-668)	Seed Fertilizer	6	3	6.75	4.23	18550	50430	31880	2.71
Dantewada	Field pea (Subhra)	Seed, Fertilizer	6	2	7.45	4.95	18570	45320	26750	2.44
Dantewada	Tomato (Arka Rakshak)	Seed, Fertilizer & Pesticide	6	1.5	351	265	49650	182500	132850	3.67
Dantewada	Brinjal (Arka Keshaw)	Seed, Fertilizer & Pesticide	7	2.5	214	167.5	45850	149850	104000	3.27



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
Dantewada	Cowpea (Indira Barbati Lal)	Seed, Fertilizer & Pesticide	8	1	39.4	27.89	13560	54018	40458	3.98
Sonepur	Introducing of short duration varieties	Black gram-prasad	16	8	5.6	21.73	12800	28000	15200	2.18
Sonepur	Introducing of drought tolerant varieties	Paddy-Sahabhagi dhan	32	10	32.4	22.8	22800	42120	19320	1.84
Sonepur	Introducing short duration varieties paddy	Paddy-Jogesh	16	4	30.8	22.8	22800	40040	17240	1.75
Ganjam	Black gram-Prasad	Seeds, micronutrient, pesticide	14	4	4.1	5.2	12300	26000	13300	2.1
Ganjam	Paddy-Sahabhagidhan	Seeds, micronutrient, weedicid, pesticide	18	6	26.8	22.3	17600	37520	21120	2.13
Ganjam	Paddy- Swarna sub-1	Seeds, micronutrient, weedicid, pesticide	16	4	42.3	39.1	24400	59220	34820	2.43
Jharshuguda	Introduction of Paddy variety-Sahabhagi dhan	Seeds	29	4	31	24	18000	37200	19200	2.06
kendrapara	Demonstration of Flood tolerant Paddy var. Swarna sub-1	Swarna sub-1 and management practice	20	10	44	40.2	32000	68200	36200	2.13



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha.)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
Kalahandi	Sesamum - Prachi		15	2.5	3.2	1.7	9000	19200	10200	2.13
Kalahandi	Maize - PAC 745		25	5	14.8	11.7	9500	23680	14180	2.49
Kalahandi	Black gram - Prasad		55	12	10.2	7.8	12500	91800	79300	7.34

Table . 2 KVKs wise Advancement of planting dates of rabi crops in areas with terminal heat stress demonstration details

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
Tikamgarh	Wilt resistant variety chickpea JG-16 and	Chickpea variety Jg-16	12	5	18.9	12.24	20200	75600	55400	3.74
Tikamgarh	Mustard variety Rohani	Rohani	12	20	12.36	16.94	14200	44912	30712	3.1
Balaghat	Early variety of chick pea	Seed of JG-11	5	2	14.8	11.2	16250	56462	40212	3.4
Balaghat	Early sowing of mustard NRCDR-2	Seed of NRCDR-2	5	2	12.7	7.6	23900	44450	39940	1.8
Balaghat	Wheat Var. JW-3211 (Heat Tolerant Var.)	Seed of JW-3211 (Speed Composting)	5	2	39.6	24.5	26400	61380	34980	2.3
Balaghat	Linseed Var. KARTIKA	Seed of KARTIKA	5	1	8.5	5.2	13300	34850	21550	2.6



Morena	high yielding variety suitable for late Sowing suitable for pigeon pea/ rice - wheat cropping system in zero till seed drill sowing method	RVW-4106	10	25	48	45	38820	91600	52780	2.3
Ratlam	Drought resistant Laxmi variety of Mustard	Laxmi	10	4	10.48		10200	43200	33000	3.2
Satna	Substituted existing var. of chick pea –JG-315 with heat tolerant variety JG-14	JG-14, organic manure 2t/ha,	13	4	7.79	5.22	20140	45961	25821	2.28
Bilaspur	Line sowing & Improved cultivation of Chickpea	JG 14 & provide seed drill and Rotavator for line sowing	13	5.2	7.5	4	9500	22750	13250	2.3
Bhatapara	Drought tolerant variety of wheat- Ratan	Ratan, DAP 125 Kg per ha	3	1.2	22.7	20.2	11400	35185	23785	3.09
Sonepur	Green gram-TARM-1	Seeds, bio-fertilizer, seed treating chemicals	22	8	7.2	5.4	14600	36000	21400	2.46
Ganjam-1	Green gram-TARM-1	Seeds, micronutrient, pesticide	13	5	5.1	7.4	19400	44640	25240	2.3
kendrapara	INM in Green Gram	Fertilizers	10	2	6.6	4.5	15000	27720	12720	1.84
kendrapara	INM Black Gram	Fertilizers	10	2	6.4	4.3	15000	30080	15080	2.01



Kalahandi	Planting of rabi vegetable crops with terminal heat stress	Brinjal - VNR-218, 212	29	1	148	98	34500	148000	113500	4.28
Kalahandi	Planting of rabi vegetable crops with terminal heat stress	Tomato -Utkala kumari	38	2	173	136	38000	173000	135000	4.55
Kalahandi	Cultivation of drought tolerant chilli	Chilli - Agnirekha	40	1	20	12.5	42500	160000	117500	3.76

Table. 3- KVKs wise water saving paddy cultivation methods (SRI, aerobic, direct seeding) demonstration details

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
Balaghat	Direct seedling of Seed Drill	Paddy Seed of MTU-1010	5	2	52	38.2	19530	53862	34332	2.7
Balaghat	SRI	Paddy Seed of MTU-1010	5	2	59.6	42	23000	84036	61036	3.6
Datia	Direct seeded Rice	PB-1509	5	1.2	28	--	24450	91588	67138	3.75
Satna	Introduction of new variety in paddy, (DSR)	Sahbhagi, organic manure 4t/ha	7	2	33.6	21.5	25640	42000	16360	1.64
bilaspur	Direct Seeded Rice	Var-Mahamaya & provide seeddrill for line sowing	10	3	31	22	20000	44950	24950	2.2



Bhatapara	DSR	MTU-1010, DAP 125 Kg per ha	5	1.6	29.95	26.1	30550	43427.5	12877.5	1.42
Bhatapara	DSR	Mahamaya, DAP 125 Kg per ha	8	2.4	34.8	31.5	33390	50460	17070	1.51
Dantewada	SRI	Variety (MTU 1010)	5	3	43.35	25.84	24580	62858	38278	2.55
Dantewada	DSR	Variety (Sahabhagi)	10	4	36.14	24.56	21254	52403	31141	2.46
Jharshuguda	SRI method of Paddy cultivation	Seeds	5	2	53	44	22000	63600	41600	2.8
Kalahandi	Line sowing by paddy drum seeder	Drum seeder	45	21	42	37	14500	50400	35900	3.47

Table. 4- KVKs wise Frost management practice details

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo /ha	Local/ ha	Gross Cost	Gross Return	Net Return	BCR
Tikamgarh	Fumigation (chickpea)	Technical Advice	15	10	18.9	12.24	20200	75600	55400	3.7 4
Morena	high yielding , aphid tolerant Mustard	NRCHB- 101	10	25	21.4	19.3	22000	96300	77300	4.5
Morena	high yielding , aphid tolerant suitable for rain fed condition	Mustard RH- 749	10	25	22.6	19.8	22000	109700	87700	4.9



Table. 5- KVKs wise Community nurseries for delayed monsoon

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
Tikamgarh	Chili	Technical Advice	5	2	162	118	40500	293040	252540	7.25
Balaghat	Nursery of Paddy	Seed of Paddy Hybrid	6	2.4	51.6	36.2	21600	72756	51156	3.3
Balaghat	Nursery of Onion	Seed of Onion + Chemicals (Seed Treatment)	112	2.5	216.5	186	59000	223500	164500	3.7
Morena	-Evolution of relay cropping in mustard +bar seam suitable for drought condition and mordent resistant disease. Good yield potential, adaptability and suitability and stability for grain yield under normal sown irrigated conditions. Resistant to rusts, for limited water irrigated	Mustard RVM-2	10	25	22	19	99000	101940	79940	4.6
Morena		Berseem BB-3	10	25	8.9	8	32000	71500	39500	2.2
Morena		Chickpea (JAKI - 9218)	10	25	22.3	19.8	30500	108010	87510	3.5
Bilaspur	Improved Paddy nursery	Var.-Indira Maheshwari	20	6	32	22	29640	46400	16760	1.5



Bilaspur	Improved Vegetable Nursety	Tomato variety- Laxmi5005 & Trichoderma Bioagent	9	2.5	125	80	40000	125000	85000	3.1
Sonepur	Paddy-Pratikshaya	Seeds	18	0.4						
sonapur	Vegetable - Tomato	Seeds	8	0.8						
Ganjam-1	Paddy-Pooja	seeds	16	1						
Kalahandi	Community Vegetable Seedling raising during Kharif season to mitigate the drought situation	Seed, micronutrient, PP chemicals	35	5	25	14	25000	16500	7200	2.94

Table. 6- KVKs wise Custom hiring centers for timely planting demonstration details

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo /ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
Tikamgarh	MB Plough/BBF	MB Plough/BBF	24	30	12.07	10.29	18300	38640	20340	2.11
MORENA	Use in zero till seed drill sowing method	Wheat (MP4010)	10	25	50.2	48.1	38820	92390	53570	2.37
MORENA	Use in zero till seed drill sowing method	Barley (RD- 2786)	5	1	41.7	36.4	18650	67126	48476	3.59
MORENA	Raised bed planter sowing	Cluster bean	10	25	16.8	14.2	28239	63300	35061	2.24
Guna	MB Plough	Summer deep ploughing	10	10	10.95	7.32	17430	32809	17890	2.02



Guna	Hand wheel hoe	Soybean	20	20	10.65	7.28	17445	32813	17889	2.05
Guna	Seed cum Fertilizer – drill	Soybean	10	10	10.85	7.42	17442	32801	17888	2.07
Guna	Rotavater	Wheat	10	10	44.29	34.15	22671	69212	46563	3.07
Guna	Power sprayer	Gram	20	20	16.68	14.31	21877	53612	31469	2.38
Guna	Reaper	Soybean	10	10	10.65	7.32	17452	32817	17879	2.06
Guna	Sprinkler set	Wheat	5	5	44.31	34.11	22659	69217	46558	3.09
Bisapur	Line sowing & improved cultivation technique of Pigeon pea	Var.-ICPL-88039 & provide seeddrill for line sowing.	50	2	7	3.5	15000	30100	15100	2
Bisapur	Line sowing & improved cultivation technique of Moong bean	Var.-HUM 16 provide seeddrill & Roravator for line sowing.	25	8	7.5	3	12000	34875	22875	2.9
Bisapur	Line sowing & improved cultivation technique of chickpea	Var.-JAKI-9218 & provide seeddrill for line sowing & Roravator.	4	1.6	6	4	8500	19050	10550	2.2
Bisapur	Improved Paddy cultivation	Var.-Indira Barani Dhan provide seeddrill for line sowing.	13	4	30	23	28110	42300	14190	1.5
Bisapur	Improved Paddy variety cultivation	Var.-Indira maheshwari provide seeddrill for line sowing .	20	6	32	22	27640	46400	18760	1.6



Bisapur	Improved Paddy variety cultivation	Indira Rajeshwari, provide seeddrill for line sowing.	6	2	33	22	30110	47850	17740	1.5
Bisapur	Improved Lathurus cultivation	Var.-Prateek	6	2	4.75	3	10000	17525	7525	1.75
Dantewada	Line sowing with seed cum fertilizer drill var. Indira Barani Dhan-1	Rice	76	8	28.45	22.15	14360	41252	26892	2.87
Dantewada	Thresher	Rice	120	36	35.5	21.95	15980	51475	35495	3.22
Dantewada	Harrowing with rotawator followed by rice var. Sahabhazi	Rice	38	6	30.25	23.9	16050	43863	27813	2.73

Table. 7 - KVKs wise Location specific intercropping systems with high sustainable yield index

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
Balaghat	Chick pea + Coriander	Seed of Chick pea & Coriander	5	2	16.7	-	17500	75150	57650	4.2
Balaghat	Paddy + pigeon pea + colocasia	Seed of Paddy + pigeon pea	2	1	57.7		27940	92830	64890	3.3



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
		paddy			53.6	-	24800	83080	58280	3.3
		Pigeon pea			1.2		1850	5400	3550	2.9
		Colocasia			2.9		1290	4350	3060	3.3
Morena	intercropping systems	Pigeon pea + Maize 2;1	5	1	117.2	91.1	44000	855000	102700	3.4
Jhabua	Soybean + Maize	Seed	10	4	14.5	9.35			29045	2.44
Jhabua	Maize+ cotton	Seed	5	2	17.94	13.1			64040	2.85
Ratlam	Intercropping Soybean + Maize	Chickpea (JG-14)+ Safflower (JSI-7)	4	1.6	16.30 + 7.0		18200	68480	50280	3.76
Bhatapara	Intercropping of Chickpea + Coriander (10+2)		5	1.2	13.6	11.3	35600	58480	22880	1.64
Kalahandi	Intercropping system for sustainable production	Cotton + local Arhar	56	43	10.4	8.7	12400	41600	29200	3.35
Kalahandi	Intercropping system for sustainable production	Paddy + Arhar	17	12	21	17	8500	25200	16700	2.96
Bilaspur	Wheat + Mustard	Wheat (MP 1203) + Mustard (C.G.Sarson) & Provide Seed drill and Rotavator for line sowing	10	4	17	-	20000	33200	13200	1.6



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo/ha	Local/ha	Gross Cost	Gross Return	Net Return	BCR
Bilaspur	Chickpea + Safflower	Chickpea (JG-14)+ Safflower (JSI-7) & Provide Seeddrill and Rotavator for line sowing	13	5.2	11	-	15000	34425	19425	2.2
Bilaspur	Chickpea + Coriander	Chickpea (JG-14)+ Coriander (JD-1) & Provide Seeddrill and Rotavator for line sowing	2	1	12	0.16875	25000	67050	42050	2.6

Table- 8- KVKs wise other demonstration conducting under Crop production module

KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo /ha	Local /ha	Gross Cost	Gross Return	Net Return	BCR
Balaghat	Brinjal	Seed of Brinjal Var. Harshita	5	0.2	285	196	82000	192588	110588	2.3
Balaghat	Chilli	Seed of Chilli Var. NS.1701	5	0.2	159	119	85000	228300	150300	2.6
Balaghat	Tomato	Seed of Tomato Var. Laxmi 5005	5	0.2	380	212	84000	345000	261000	4.1
Balaghat	Okra	Seed of Okra Var. Shakti	5	0.2	138	109	58500	182428	123928	3.1
Morena	Brown manuring daincha + pearl millet	Sesbenia (dencha) + Pearl millet	10	25	-	10.2 + 20.1	-	1200 + 17000	30400 + 31110	-



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo /ha	Local /ha	Gross Cost	Gross Return	Net Return	BCR
Datia	Bottle guard		5	1	15.36		55777	264300	208523	4.74
Datia	cucumber		5	1	151		56712	239470	182758	4.22
Datia	Pumpkin		5	1	109		54842	225295	170453	4.11
Datia	Cow pea		5	1	322		58582	172680	184098	2.95
Jhabua	Tomato	Seed, Nutrient, Insecticide	10	2	399	255	71000	259350	188350	3.65
Jhabua	Chilli	Seed, Nutrient, Insecticide	10	2	156	119	46000	140400	94400	3.05
Jhabua	Okra	Seed, Nutrient, Insecticide	20	4	131	91.25	42000	131000	89000	3.12
Jhabua	Bottle Gourd	Seed, Nutrient, Insecticide	50	5	181.5	139	41500	145200	103700	3.5
Jhabua	Bitter Gourd	Seed, Nutrient, Insecticide								
Jhabua	Sponge Gourd	Seed, Nutrient, Insecticide								
Jhabua	Ridge Gourd	Seed, Nutrient, Insecticide								
Jhabua	Bean	Seed, Nutrient, Insecticide								
Jhabua	Onion	Seed	2	1	132.6	98.5	32000	106080	74080	3.31
Ratlam	Varietal replacement of Fenugreek	RMT-305+RDF+Need based plant protection measers	1	0.4	16.5		22900	74250	51350	3.24
Ratlam	High yielding variety of Ajwain (Kharif)	AA-1	3	1.2	10.6		22500	84800	62300	3.76
Ratlam	High yielding	AA-1	2	0.8	12.1		21100	96800	74700	4.38



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo /ha	Local /ha	Gross Cost	Gross Return	Net Return	BCR
	variety of Ajwain (Rabi)									
Ratlam	Varietal of Onion	Bhima Super+ RDF + Need based plant protection measures	5	2	230		48500	230000	181500	4.74
Ratlam	Farmers practice	Nasik				185	45900	185000	139100	4.04
Bhatapara	Line Sowing of maize with seed cum fertilizer drill	Rashi-4212	7	2	42	38	24600	62580	37980	2.54
Bhatapara	Line Sowing of Kharif pigeonpea in Farm bunds	Asha	12	2	7.6	6.45	13900	57000	43100	4.1
Bhatapara	Utera	Mahatiwda	3	1.8	7.4	5.4	11250	26418	15168	2.35
Bilaspur	Improved Vegetable production Tomato	Var- Abhilash & Trichoderma	5	1.5	175	100	50000	175000	125000	3.5
Bilaspur	Improved Brinjal cultivation	Var-VNR-212 & Trichoderma	8	2	125	80	40000	125000	85000	3.1
Bilaspur	Improved Chilli cultivation	Var-NS-238 & Trichoderma	8	2	100	60	50000	160000	110000	3.2
Bilaspur	Improved Mustard cultivation	Var. (C.G.Sarson) & Provide Seeddrill and Rotavator for line sowing	6	2.5	8	4.5	16000	24160	8160	1.5



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)			
					Demo /ha	Local /ha	Gross Cost	Gross Return	Net Return	BCR
Bilaspur	Improved Safflower cultivation	Var. (JSI-7) & Provide Seeddrill and Rotavator for line sowing	4	1.6	7.5	5	10000	22875	12875	2.2
Bilaspur	Improved Coriander cultivation	Var-(JD-1) & Provide Seeddrill and Rotavator for line sowing	3	1	6	4	18000	60000	42000	3.3
Ganjam	Pigeon pea-Asha	seed	10	4	8.2 (maize)	22.3 (paddy)	19200	41000	21800	2.13
Jharshuguda	Introduction of Hybrid Maize	Seeds	28	4	39	23	45500	184000	138500	4.04
Jharshuguda	Boron application in Cauliflower	Boron	14	0.8	162	128	58000	280000	222000	4.8
Jharshuguda	Integrated Nutrient Management in Brinjal	Micronutrients	13	0.4	183	154	60000	270000	210000	3.5
Kendrapara	Demonstration of Botanicals and bio agent for management of stem borer in paddy.	pheromone trap and Trichogramma japonicum	10	2	43.4	37.8	29769	52080	22311	1.74
Kendrapara	Demonstration of Bioagent for management of	Trichogramma chilonis	10	2	130	124	150000	286000	136000	1.9



KVK	Technology demonstrated	Critical input (Variety, Fertilizer / Chemicals doses,)	No. of farmers	Area (ha)	Yield (q/ha)		Economics of demonstration (Rs./ha)				
					Demo /ha	Local /ha	Gross Cost	Gross Return	Net Return	BCR	
	Internode borer in sugarcane.										
Kendrapara	INM in Sugarcane	Fertilizers	10	4	124	99.5	98000	285944	187944	2.91	
Kendrapara	Demonstration of Tomato var. Swarna sampada	Tomato seedling variety Swarna sampad	10	1	410	265	70000	205000	135000	2.93	
Kendrapara	Demonstration on cultivation of Ground nut	Groundnut seed var. TMV-2	20	4	23.2	18.1	28000	58000	30000	2.07	
Kendrapara	Horti based farming system (Banana cv TC Bantal	Banana seedling (10 unit)	10	Continue							
Kendrapara	Demonstration of paddy straw Mushroom cultivation	Distribution of paddy straw spawn to SHG (300 bed)	30	2 kg per bed	0.8 kg per bed	150	50/- per bed	Rs. 150/- per bed	100/-	3	
Kendrapara	Demonstration of Oyster Mushroom Cultivation	Distribution of oyster mushroom spawn to SHG (300 bed)	30	2.5 kg per bed	1.2 kg per bed	108.3	30/- per bed	150/- per bed	120/- per bed	5	
Kalahandi	Demonstration on drought tolerance Black gram	Black gram C.v- Prasad	55	12	10.2	7.8	12500	91800	79300	7.34	



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