Farmer FIRST Programme

ANNUAL PROGRESS REPORT - (2021-22)

Title of the Project

“Socio-economic upliftment of tribal farmers through suitable agricultural enterprises integration in rice fallow pulse cropping system - A participatory approach for doubling the farmer's income”

ICAR - National Institute of Biotic Stress Management

Indian Council of Agricultural Research

Baronda, Raipur, Chhattisgarh - 493 225

Contents

Farmer FIRST Programme

ANNUAL PROGRESS REPORT (APR) - 2020-21

A. Background information:		
1	Name of Centre	ICAR - National Institute of Biotic Stress Management Baronda, Raipur, Chhattisgarh - 493 225
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4	Title of FFP Project	**"Socio-economic upliftment of tribal farmers through suitable agricultural enterprises integration in rice fallow pulse cropping system - A participatory approach for doubling the farmer's income"**

B. Introduction:

Baloda Bazar is a district in Chhattisgarh state of India selected as study area for this Farmer's FIRST project. Baloda Bazar is located at 30.67°N 82.17°E. It has an average elevation of 254 m (833 ft). The district is subdivided into six development blocks called *tahsils*, namely Palari, Baloda Bazar, Kasdol, Bilaigarh, Bhatapara and Simga and 3 subdivisions namely Baloda Bazar, Bhatapara and Bilaigarh. Baloda Bazaar is also called Cement hub of Chhattisgarh because there are many reputed Cement Plant. This town was very famous for its cattle market in the region. The market still exists with name "*BhaisaPasra*". The adjacent districts of Balodabazar-Bhatapara are Bemetara, Mungeli, Bilaspur, Janjgir-Champa, Raigarh, Mahasamund and Raipur. Rice is grown in more than 80% area during *Kharif* season. Cropping intensity of the area is 125 %. Chickpea, wheat, horse gram, lathyrus and field pea are major rabi crops in the cluster villages. The project site is about 130 Kms. away from the ICAR-NIBSM,

Raipur. Totally, 500 farm families selected form 5 cluster villages namely Kharaha, Bamhani, Kurraha, Kharri and Bakla of Baloda Bazar district.

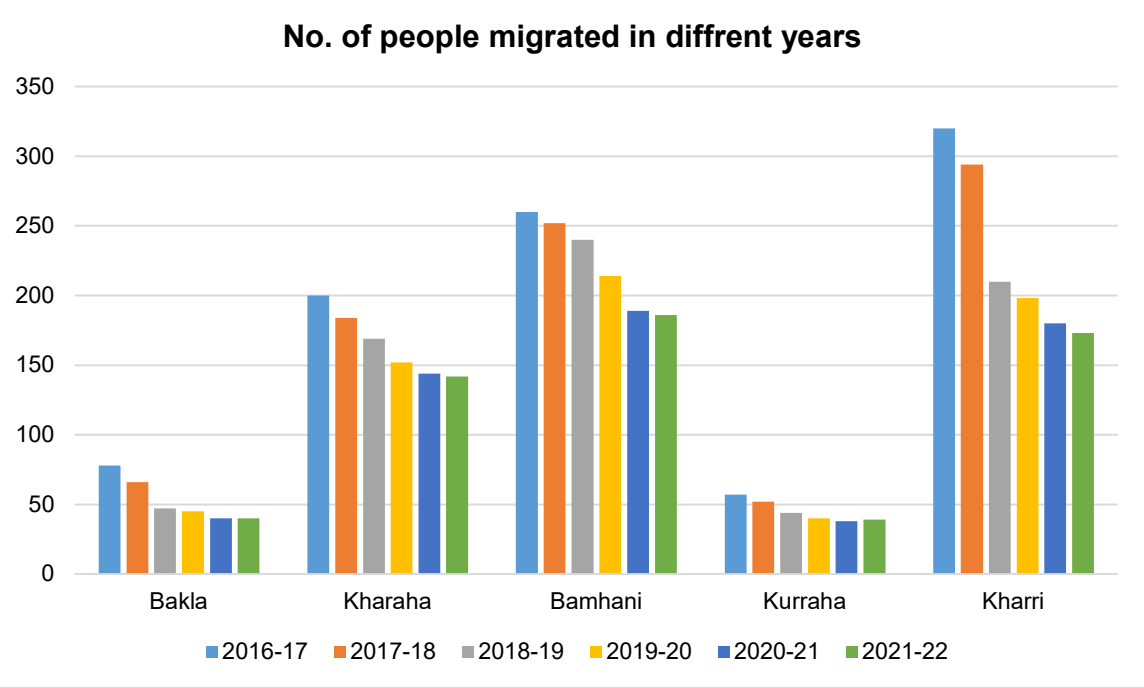
Major agricultural issues in the study area:

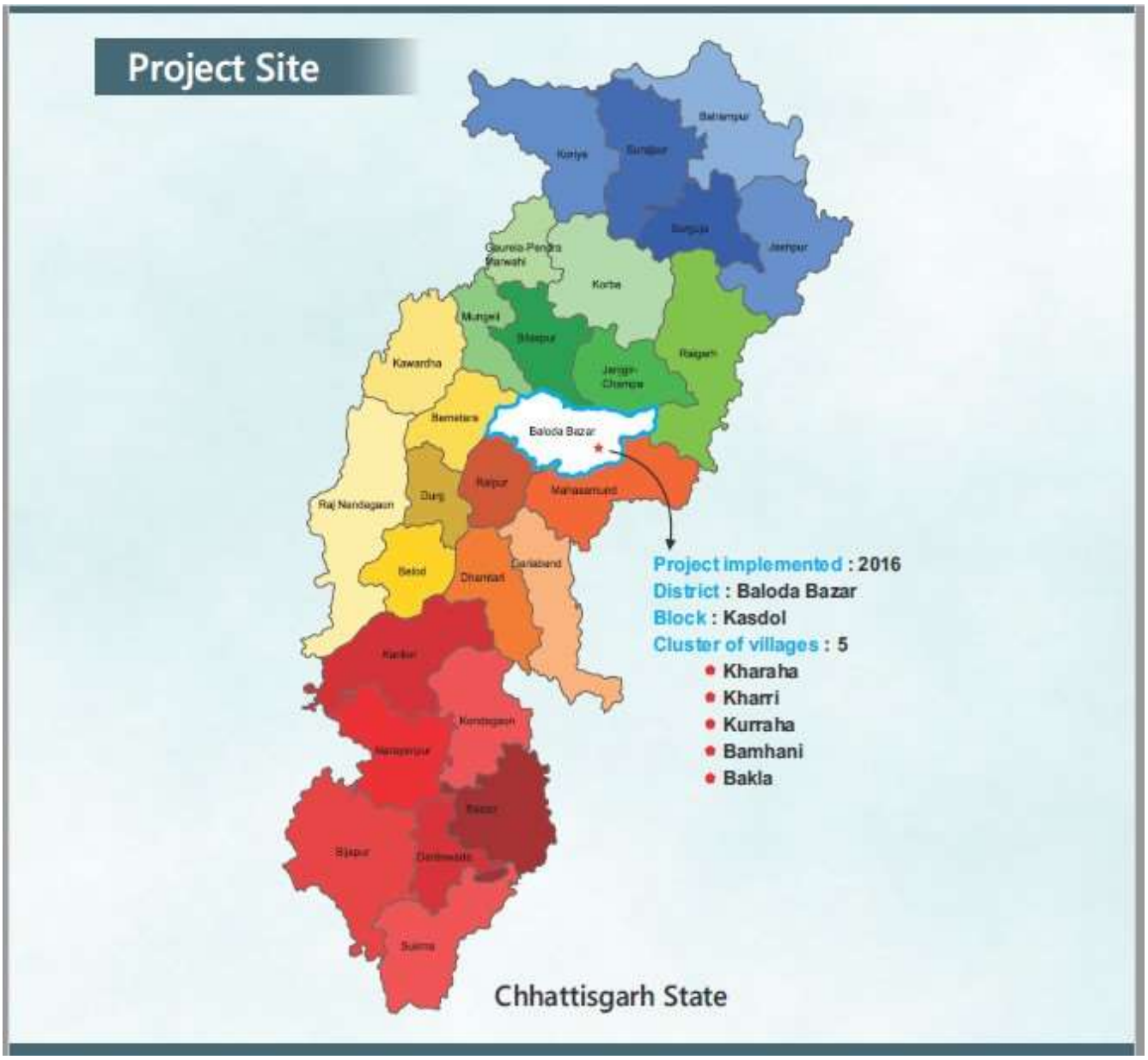
- Rice fallow lands (82% of land left fallow after *Kharif* season)
- Low production and productivity
- Low level adoption of high yielding varieties
- Unawareness of GAPs and modern management strategies
- Lack of knowledge in plant protection measures & technical know-how
- Shortage of valid and timely farming information
- Lack of alternative livelihood options
- Inability to do higher investment
- Lake of marketing network
- Shortage of skilled labour
- Mono cropping (Rice-Rice-Rice)
- Lack of awareness on conservation of biodiversity and importance in sustainability of homestead system.
- Subsistence nature of farming.

The above issues addressed by the Farmer FIRST programme in these villages and the impact and benefits were presented in this report.

Migration details of the farmer in FFP adopted villages

Year	Number of people migrated in the adopted FFP villages					Total
	Bakla	Kharaha	Bamhani	Kurraha	Kharri	
2016-17	78	200	260	57	320	**915**
2017-18	66	184	252	52	294	**848**
2018-19	47	169	240	44	210	**710**
2019-20	45	152	214	40	198	**649**
2020-21	40	144	189	38	180	**591**
2021-22	40	142	186	39	173	**580**




Project Site
Baloda Bazar
Project implemented : 2016
District : Baloda Bazar
Block : Kasdol
Cluster of villages : 5
Kharaha
Kharri
Kurraha
Bamhani
Bakla
Chhattisgarh State

C. Objectives:

Objective wise activities as per action plan

Sr. No.	Objective	Activities/ Technology Intervened
1.	To study the existing rice fallow pulse cropping system, livelihood pattern, problem identification, priority setting, information need, perceived constraint and socio-economic profiling of the resource poor farmers.	• PRA and baseline survey conducted • Improved varieties of pulses and oilseed crops introduced and seed provided • Happy seeder and Aqua-ferti seed drill introduced for rice fallow pulses • Zero tillage • Line sowing of pulses and oilseeds crops • Training provided and demonstration conducted on GAPs
2.	To augment the capacity building at field level for farmer-participatory research and extension in adoption and expansion of selected interventions on crop, livestock, horticulture and NRM based enterprises.	• Capacity building programmes - training, demonstration, group discussion, exposure visit, educational tour and farmers scientist interface organized on various agricultural technologies • Training provided to tribal farmers on mushroom production, *Kadaknath* farming, goat farming, hatching of *Kadaknath* eggs, hi-tech horticulture, and low-cost azolla production • Successfully operation and management of Custom Hiring Centers (CHCs) and make available drudgery reduction agricultural equipment • Two Farmer Communication Centers (FCCs) established at FFP villages to make available need-based information of latest agriculture technologies
3.	To develop, establish and evaluate the sustainability of integrated livelihood generating farming models for resource poor rural farmers.	• Introduced improved goat breed (Sirohi, Jamanapari and Barbari) which to empower tribal farmers • High value chicken (*Kadaknath*) introduced along with egg hatchery units as backyard and commercial poultry farming for livelihood improvement of tribal farmers • Oyster and paddy straw mushroom production unit established and training provided to farm women and rural youth to generate income and

		nutritional security from waste paddy straw • Established four Agro Processing Centers (APCs) to process and value addition of agro products
4.	To evolve suitable up scalable farm technologies for women farmers to address drudgery reduction, income enhancement and livelihood security.	• Established four Custom Hiring Centers (CHCs) and make available drudgery reduction useful agricultural equipment • Oyster mushroom production unit established and training provided to farm women to generate income and nutritional security from waste paddy straw • Started four Agro Processing Centers (APCs) at tribal villages and established – PKV mini dal mill, mini rice mill, flour mill, pulvarizer, oil expeller machine and spice grinder for income enhancement and livelihood security
5.	To develop and test the effectiveness of Educational Multimedia Training Modules (EMTMs) on biotic stress management technologies in rice fallow pulse cropping system.	• Agricultural Film Shows (AFSs) organized during night on biotic stress management technologies and latest agricultural technologies • Interactive Educational Multimedia Training Modules (IEMTMs)kept in the Farmer Communication Centers at village level • Knowledge test on various on biotic stress management technologies conducted • Popularized the various agricultural based mobile app among the farmers.
6.	Research backstopping for further improvement of crop, livestock, horticulture, rice fallow pulse and NRM based enterprises for desirable traits preferred by the farmers and stakeholders.	• Initiatives for Farmer Producers Organisation (FPOs) • Continued input support required. • Networking with gross-root organisations. • Technologies for value addition • Infrastructure facility and machineries for agro-processing centers. • Continued information support

1. Module-wise interventions carried out

Module-wise Intervention	Crop	Variety/ Breed	Villages covered	Area covered (ha)/ Animal (No.)	Number of House holds covered
A. Crop Based Module					
Introduced and demonstrated improved high yielding and drought tolerant rice varieties	Rice	IR – 64, Chandrahasini, IGKV R-1, IGKV R-2, Indira Aerobic, Swarna, HMT, Mahamaya and Indira Barani	05	54	76
Demonstrated System of Rice Intensification (SRI) technology and mechanical weed management through Ambika Paddy Weeder	Rice	MTU-1010	01	01	02
Introduction and demonstration of the fodder crop to ensure fodder availability for the livestock.	Maize and Napier grass	Farm Sona and Napier Grass-G07	03	2.20	11
Demonstration of the harvesting and post-harvest practices of Rice	Rice	MTU 1010, Swarna, Indira Aerobic, IR-64 and IGKV R-2	05	24	58
Demonstration of the mechanical harvesting of summer rice	Rice	Indira Aerobic, Mahamaya and MTU-1010	02	6.20	23
Demonstration of seed treatment with fungicides	Rice	Swarna, Indira Aerobic, IR-64, IGKV R-2, Danteshwari	05	-	40
Demonstration of the line transplanting of rice crop	Rice	Swarna, MTU-1010, Indira Aerobic, IR-64 and IGKV R-2	03	8.20	18
Installation and demonstration of *trichocard* for the eco-friendly management of rice stem borer	Rice	Swarna, Indira Aerobic, IR-64 and IGKV R-2, Danteshwari, Indira Barani	05	8.5	100
Demonstration of the plant protection measures in rice	Rice	Swarna, Indira Aerobic, IR-64 and IGKV R-2	05	19.20	106
Demonstration of the Integrated Nutrient	Rice	Swarna, Indira Aerobic, IR-64 and	03	4.2	38

Management (INM) in Rice		IGKV R-2,			
Demonstration of rice fallow pulses and oilseed crops using improved varieties and conservation technologies	Lathyrus, Chickpea and Mustard	Lathyrus (Prateek and Mahateoda), Chickpea (Vaibhav and RVG- 201), and Mustard (CG Sarson amd Pusa Mustard - 25)	05	42	167
Demonstration of *Utera* cropping using improved varieties	Lathyrus, Mustard and Chickpea	Prateek, Pusa Mustard - 25 and RVG - 201	05	12.60	37
Demonstration of the Nipping in the chick pea and lathyrus	Lathyrus, Chickpea	Lathyrus - Prateek, Chickpea - GJ-11	03	08	36
Demonstration of Insect and disease management in chickpea and Mustard	Chickpea and Mustard	Chickpea – GJ-11 Mustard – CG Sarson	02	03	22
Harvesting and post-harvest management of rice fallow pulses	Lathyrus and Mustard,	Lathyrus - Prateek, Mustard - CG Sarson	04	28	40
Demonstration of mechanical integrated weed management (IWM) in summer rice	Rice	MTU-1010 and IR 64	02	05	06
B. Horticulture Based Module					
Demonstration of scientific vegetable production technology using improved high-yielding varieties	Brinjal, Okra, Tomato, Cowpea, Chili, Radish, Palak and Pumpkin	Improved from NSC, TNAU, IIHR and IGKV	05	8.75	64
Demonstration of the biological disease and pest management through *Trichoderma viride* and *Metarhizium*	Tomato, Brinjal	Abhilash and Improved from NSC	02	0.4	02
Demonstration of the nutritional home and terrace gardening with improved variety, to provides fresh vegetables for the day-by-day consumption	Bottle gourd, Brinjal, Okra, Tomato, Cowpea, Chili, Radish, Palak and Cluster bean	improved from NSC	05	-	230
Demonstration of scientific Pumpkin and Ash gourd	Pumpkin, Ash gourd	Indrajeet, BSS 987	01	40	26

production					
Establishment of fruit orchard with the variety of fruit plants	Mango, Citrus, Guava, Pomegranate, Custard apple, and Jackfruit	Mango – Dasheri, Langra, Banganapalli, Chhattisgarh Nandiraj and Improved from IGKVV	03	1.2	06
Demonstration of the scientific bitter gourd and tomato production under the poly house and shade net house	Bitter gourd, Tomato	VNR and NSC variety	02	240m^2	02
Training cum demonstration on the Management of fruit plants	Mango, Citrus, Guava, Custard apple, and Jackfruit	Improved from IGKVV	04	1.5	24
Scientific turmeric production using improved variety	Turmeric	Roma	05	4.30	28
Demonstration of the intercultural operation and plant protection in the Turmeric crop	Turmeric	Roma	02	1.20	14
Demonstration of scientific nursery raising technology	Chilli, Brinjal	DBHL-20 and NSC variety	02	-	04
Installation and demonstration of the trichocard for eco-friendly pest management	Okra, Cowpea, Brinjal, Chilli and Tomato	Improved from NSC	03	2.5	16
Demonstration of Intercropping (Tomato+ Potato)	Tomato, Potato,	Improved	02	0.2	05
Demonstration of storage and post-harvest practices in Turmeric	Turmeric	Roma	02	1.0	18
Flower production under the polyhouse	Gerbera	Improved from IGKV	01	120 m^2	01
C. Livestock Based Module					
Backyard poultry farming with Kadaknath chicks		Kadaknath	03	1620	06
Vaccination of the Kadaknath chicks		Kadaknath	03	1340	03
Group discussion on the		Kadaknath, goat –	04	34	42

health and housing management of Kadaknath and goat		Sirohi, Barbari and Jamunapari			
Hatching of Kadaknath and Quail eggs at Village Hatchery Units (VHUs)		Kadaknath	02	723	06
Goat Farming with improved breed and scientific management practices		Sirohi, Barbari and Jamunapari	04	40	25
D. Enterprise Based Module					
Demonstration of Paddy Straw mushroom production for the additional income generation.	Mushroom	*Volvariella volvacea*	01	02 unit	02
Demonstration of milky mushroom production	Mushroom	*Calocybe indica*	01	01 unit	01
Demonstration of oyster mushroom production	Mushroom	*Plurotus florida*	02	02 unit	02
Processing and value addition of agro products (rice, flour, dal, daliya and spices) through Agro-processing Centers (APCs)	-	-	02	-	02
Extraction of the mustard and linseed oil with the help of mini oil expeller machine at agro processing centre (APC)	-	-	01	-	01
E. NRM Based Module					
Demonstrated paddy straw as organic mulch to prevent water loss and weeds in vegetable field	Vegetable and Turmeric crop	-	03	2.3	12
Soil and water conservation through zero tillage technique using of Happy Seeder and Aqua-Ferti Seed drill were demonstrated	Rice fallow pulses	-	05	18	36
Multiplied the waste decomposer culture and applied in the rice and	Rice	-	03	1.8	06

vegetable field to improve soil fertility.					
To reduce the cost and availability of feed under poultry and goat farming we have integrated the Azolla production unit with the poultry shed and established low-cost Azolla production units.	Azolla	-	05	14 units	14
Demonstrated low-cost drip system with poly mulching for conservation agriculture.	Vegetable crops	-	03	-	04
Capacity building programme on scientific azolla production and sustainable feed management conducted.	Azolla	-	05	-	64
Awareness created on soil health and water management, zero tillage and conservation agricultural practices.	-	-	05	-	34
Utilized the waste paddy straw for production of oyster and paddy straw mushroom.	-	-	03	05 units	05

F. ICT Based Module

Module	Whats App			No. of calls		No. of Text message	No. of villages covered	No. of Farmers covered
	No. of chats	No. of videos	No. of clips	Outgoing	Incoming			
Crop modules	627	176	108	740	575	286	05	1452
Horticulture	485	129	137	595	520	123	05	1047
Livestock	271	54	78	322	240	50	05	639
Enterprise	98	75	76	228	159	25	05	143
NRM	171	5	55	297	127	0	05	383

Distribution of Improved seed materials

Line Transplanting | Mechanical weed management

Scientific rice cultivation

Mechnical harvesting of mature rice crop

Seed treatment

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<tr><td colspan="2">Installation of Trichocard</td></tr>
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Rice fallow pulses and oilseed crops

Safe storage of pulses seeds

Fodder production

Scientific nursery raising technique

Protected cultivation under polyhouse and shade net house

Scientific Vegetable cultivation using eco-friendly pest management technology

Scientific Turmerric Production

Post harvest management of Turmeric

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<tr><td colspan="2">Scientific vegetable cultivation and nutritional gardening</td></tr>
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<tr><td>Plantation of fruit plant</td><td>Scientific pumpkin production</td></tr>
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Application of bio-control agents

Kadaknath Farming

Hatching of Kadaknath eggs

Goat Farming

Oyster and paddy straw mushroom production

Azolla Production

Multiplication of waste decomposer culture

2. Farmer-Scientist Interface

(a) Capacity building

Particulars	No. of training	No. of villages covered	No. of farmers benefited		
			Male	Female	Total
Training cum demonstration on the safe use of agro-chemicals	01	01	06	02	08
Training cum demonstration on the paddy straw mushroom production technology	01	01	05	04	09
Training cum demonstration on the planning and layout for orchard establishment	01	02	12	02	14
Demonstration on the seed treatment of rice seed using fungicide	03	05	27	06	33
Training cum demonstration on the field preparation and sowing of pumpkin and ash gourd	02	03	18	05	23
Training cum demonstration on the line transplanting of rice	03	02	18	06	24
Farmers scientist interface organized on the latest agricultural technologies and management of biotic stress management	02	05	85	52	137
Training cum demonstration organized on the scientific nursery raising technology	01	01	08	04	12
Training cum demonstration organized on the use of poly mulching and drip system under the poly house and open condition	01	02	12	08	20
Training cum demonstration on the Integrated Nutrient Management in rice	03	02	32	06	38
Training cum demonstration on the plant protection measures in vegetables and rice	04	05	38	14	52
Training cum demonstration organized on the scientific nursery raising technology	01	01	08	08	16
Training cum demonstration on the application of trichocard in rice and vegetable crops	05	05	62	12	74

Training cum demonstration on the plant protection measures in vegetables and rice	03	05	42	12	54
Training cum demonstration on the health and housing management of Kadaknath and goat	02	02	18	09	27
Training cum demonstration on the operation and management of paddle operated low-lift pump at remote tribal village - Bakla	01	01	11	08	19
Training cum demonstration on the application of trichocard in rice and vegetable crops	05	05	62	12	74
Training cum demonstration on the harvesting and post-harvest management of rice	03	03	22	06	28
Training cum demonstration on the application of trichocard in rice and vegetable crops	04	04	36	8	44
Training cum demonstration on the Scientific nursery raising technology	01	01	08	03	11
Training cum demonstration on the seed treatment of rabi pulses	02	02	18	04	22
Training cum demonstration organized on the oyster mushroom production	01	02	12	04	16
Training cum demonstration organized on the health and housing management of goat and poultry	01	02	08	03	11
Training cum demonstration organized on the Integrated Insect Pest Management of Rabi pulses.	01	02	08	04	22
Training cum demonstration conducted on the operation and management of Kadaknath and Quail hatchery unit.	01	03	12	01	13
Training cum demonstration organized on the eco-friendly pest management through trichocard on rabi pulses and summer rice.	02	02	22	05	27
Hand’s on training organized on the making and use of low-cost light trap	01	02	12	03	15

Training cum demonstration organized on the Integrated Insect Pest Management in summer rice	01	03	13	04	17
Training cum demonstration conducted on the operation and management of Kadaknath and Quail hatchery unit.	01	02	16	03	13
Training cum demonstration organized on the eco-friendly pest management through trichocard on summer rice.	02	02	24	08	32
Hand's on training organized on the oyster mushroom production	01	01	08	04	12
Total	**61**	**05**	**683**	**230**	**917**

2. Farmer-Scientist Interface

(b) Extension activities

Name of Extension activities	No. of activity	No. of villages covered	No. of farmers benefited		
			Male	Female	Total
Demonstration cum group discussion on the post-harvest practices of summer rice	01	01	08	03	11
Demonstration of the fodder production and management for livestock	01	01	04	03	07
Awareness programme on the safe operation of agricultural activities during the COVID-19 pandemic	02	02	15	3	18
Farm advisory and group discussion through phone call and social media during the COVID-19 lockdown.	03	05	35	04	39
Distribution of the extension folders and technology literatures	02	05	18	10	28
Farmer's scientist interface on the balanced use of fertilizers and soil health management	01	05	17	04	21
Distributed technology extension folders to the tribal farmers and awareness created on the latest agricultural technologies	03	05	55	38	93
Conducted group discussion on the insect	02	03	22	10	32

and disease management of pumpkin crops					
Director ICAR – NIBSM visited the FFP site and reviewed the FFP activities and interacted with tribal farmers.	01	05	220	66	286
Group discussion on the development of village level enterprise with women SHGs	02	04	00	56	56
Online display of the “Azadi ka Amrit Mahotsav” at Farmer Communication Center, Kurraha	01	02	08	03	11
Group discussion with women SHGs on the establishment of Kadaknath farming cum hatchery unit at village level.	03	03	00	46	46
Group discussion on the preparation and sowing of rabi pulses.	04	04	142	22	164
Organized Poshan Vakita Maha Abhiyan & Tree Plantation programme on 17th Sept., 2021at Farmer Communication Centre, Kurraha	01	05	12	03	18
Farmer-scientist interface conducted on the occasion of inaugural function of new buildings of ICAR – NIBSM	01	05	28	07	35
Demonstration of Utera cropping with improved variety	05	03	12	03	15
Group discussion on the preparation and sowing of rabi pulses.	02	02	32	08	40
Organized Covid 19 awareness programme and participated in the vaccination programme	03	02	22	32	54
Organized online farmer scientist interface on the fuel and energy conservation in farming and related government schemes	01	04	18	03	21
Demonstration of line sowing of rice fallow pulses	02	02	14	05	19
Group discussion on the post-harvest management of rice	01	01	22	06	28
Group discussion on the health and housing management of goat and Kadaknath	02	02	16	04	20
Farmer’s scientist interaction on the Insect-pest of vegetable crops	01	02	19	08	27
Agricultural Film Shows (AFSs) organized on the Kadaknath farming	02	01	18	06	24

Farmer's scientist interface organized on the Swachhata and Biotic Stress Management.	01	05	10	08	18
Exposure visit cum educational tour organized on high-tech horticulture at Ganga Farm and ICAR – NIBSM, Raipur	01	05	10	08	18
Displayed the live streaming program of the releasing of Kisan Samman Nidhi fund by Hon able Prime Minister on 01.01.2022.	01	05	17	03	20
Swachhata Pakhwada celebrated in the FFP villages on 30.12.2021	03	03	44	20	
Group discussion on the Scientific Kadaknath farming and Goat farming	01	01	11	03	14
Participated on the COVID-19 awareness and vaccination programme	02	03	142	136	278
Farmers scientist interaction organized on the organic farming	01	04	12	05	17
Farmers scientist interface organised on the occasion of world pulse day	01	04	12	02	14
Demonstration organized on the scientific nursery raising technology	02	02	08	10	18
Organized two days exposure visit cum educational tour at KVK, Kanker, Jagdalpur, College of Horticulture Jagdalpur and College of Agriculture and Research Station, Jagdalpur	01	05	08	0	08
Farmer scientist interface organised on the occasion of International Women's Day	01	02	0	16	16
Farmer scientist interface organised on the major biotic stresses and latest agricultural technology	01	05	18	09	27
Group discussion organized on the care and management of goat and poultry in summer.	01	04	12	04	16
Total	**64**	**05**	**1061**	**577**	**1577**

Glimpses of capacity building programmes and extension activities


कृषि वर्ल्ड


Farmer FIRST Programme
कृषक वैज्ञानिक परिचर्चा
Farmers Scientist Interface


Farmer FIRST Programme
कृषक वैज्ञानिक परिचर्चा
Farmers Scientist Interface


Shri Narendra Singh Tomar


ग्राम पंचायत भवन बम्हनी
जनपद पंचायत - कसडोल
जिला - बलौदा बाजार छ.ग.

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3. Technology Assemblage, Application and Feedback
A. Crop based module

i) Description of technology:

a. Scientific Rice Cultivation

1. Name of technology	Scientific Rice Cultivation with improved varieties
2. Farming situation	• Small, marginal and resource poor farmers • Rainfed - Mid and lowland
3. Problem	• High biotic stress • Traditional agricultural practices • Low production and productivity of rice • Low level adoption of high yielding varieties • Unawareness of GAPs and modern management strategies • Lack of knowledge in plant protection measures/ technical know-how • Shortage of valid and timely information • Lack of user-friendly and readymade knowledge tools • Inefficient transfer of technology
4. Potential solution	• Improved variety • Tillage machines, sowing methods, seed priming, higher seed rate, timely planting, seed treatment with fungicides • Persuasion and motivation for adopting recommended IPM modules • Innovative farmer's participatory approach and ICT tools • Dissemination of GAPs in rice cropping system • Increasing knowledge and awareness in scientific rice and pulse production through knowledge tools. • Capacity building of tribal farmers using demonstration, trainings and workshops. • Mechanization and drudgery reduction tools
5. Nature of intervention	• Line sowing • Mechanical weed control • Participatory mode • Eco-friendly pest management technology

	• low cost and • User-friendly technologies
6. Source of technology	ICAR - NIBSM, SAUs, Farmer innovations.
7. Expected output	• Increased knowledge and awareness level in rice production • Less biotic stress • Increased adoption rate towards sustainable cultivation practices • Positive attitude changes towards rice cropping system • Reduced input cost • Increased yield • Training modules • Increased cropping intensity
8. Area (ha)	54.00 ha.
9. No. of farm families	76 farm families
10. Critical input	Seed, agro chemicals, farm machineries, labour, eco-friendly pest management tools
11. Crop and variety	Rice, variety - improved high yielding rice varieties such as Chandrahasini, IGKV R-1, IGKV R-2, Indira Aerobic, Swarna, HMT, and Mahamaya and drought-tolerant short duration variety Indira Barani
12. Cost of each intervention	Approximately Rs. 1,40,000/-

ii. Performance Indicators

A.	Technical Observation	Farmer's practice	Intervention
i.	**Yield** (q/ha)		
a.	Grain(q/ha)	29.80	42.10
b.	Straw(q/ha)	56.00	62.00
ii.	Total water use (m^3ha^{-1} water)/Water productivity (kg grain m^{-3})/Water use efficiency (q grain/ha/cm) ***In case of Ridge and Furrow/BBF/Laser land leveling/Zero tillage**	-	-
B.	**Economic indicators**	-	
i.	Cost of cultivation (Rs./ha)	19430	Rs. 18810
ii.	Net income (Rs./ha)	40,750/-	Rs. 63937/-
iii.	B:C ratio	2.09	3.39

C.	**Farmer's reaction**	• Improved variety help to fetch more yield and profit • Scientific technologies are easy to practice. • Eco-friendly technologies reduced input cost • Low biotic stress and healthy plants • Learnt plant protection measures and nutrient management.






b. Rice fallow Lathyrus

i) Description of technology:

1. Name of technology	Sowing of Rice Fallow Lathyrus using happy seeder and aqua-ferti seed drill
2. Farming situation	• Small, marginal and resource poor farmers • Rainfed - Mid and lowland

3. Problem	• Rice fallow lands • Low production and productivity • Low level adoption of high yielding varieties • Unawareness of GAPs and modern management strategies • Lack of knowledge in plant protection measures/ technical know-how • Shortage of valid and timely information • Lack of user-friendly and readymade knowledge tools • Lack of suitable cultivars • Poor crop stand and establishment • Diseases and pests stress • Nutrient management • Micronutrient deficiencies • Terminal moisture/heat stress • Non-availability of quality seeds • Lack of mechanization • Inefficient transfer of technology
4. Potential solution	• Off farm trails to evaluate cultivars • Tillage machines, sowing methods, seed priming, higher seed rate, timely planting, seed treatment with fungicides • Persuasion and motivation for adopting recommended IPM modules • Foliar spray of urea/DAP to supplement N and P • Residue mulching • Village based Seed Production Units • Tillage machines, zero-till planter and harvester, Happy seeder, Conservation agriculture • Innovative farmer's participatory approach and ICT tools • Introducing rice-pulse cropping system. • Dissemination of GAPs in rice-pulse cropping system • Increasing knowledge and awareness in scientific rice and pulse production through knowledge tools. • Capacity building of tribal farmers using demonstration, trainings and workshops. • Drudgery reduction tools
5. Nature of intervention	• Rice-pulse cropping system • Participatory mode

	• Eco-friendly • low cost and • User-friendly technologies
6. Source of technology	ICAR - NIBSM, ICAR - IARI, ICAR - IIPR, ICAR - CIAE, SAUs, Farmer innovations, CG State Beej Nigam
7. Expected output	• Village based seed production units • Multiplication and distribution of farmer preferred pulse varieties • Educational Multimedia Training Modules (EMTMs) on rice-pulse cropping system and Good Agricultural Practices (GAPs). • Increased knowledge and awareness level in rice fallow pulse production • Enhanced nutritional and livelihood security of tribal farmers • Digital knowledge tools on rice-pulse cropping system and GAPs • Increased adoption rate towards sustainable cultivation practices • Positive attitude changes towards rice-pulse cropping system • Suitable Livelihood model for tribal farming • Reduced input cost and increased yield • Digitalized ITKs practices • Training modules • Increased cropping intensity
8. Area (ha)	24.00 ha.
9. No. of farm families	85 farm families
10. Critical input	Seed, agro chemicals, fertilizers, farm machineries, labour,
11. Crop and variety	Lathyrus, variety – Prateek and Mahateoda
12. Cost of each intervention	Approximately Rs. 1.20 lakhs

ii. Performance Indicators

A.	Technical Observation	Farmer's practice	Intervention
i.	**Yield** (q/ha)		
a.	Grain(q/ha)	Introduced under FFP only	16.30 Qu.
b.	Straw(q/ha)	-	10.20 Qu.
ii.	Total water use (m^3ha^{-1} water)/Water productivity	-	

	(kg grain m^{-3})/Water use efficiency (q grain/ha/cm) ***In case of Ridge and Furrow/BBF/Laser land leveling/Zero tillage**		
B.	**Economic indicators**	-	
i.	Cost of cultivation (Rs./ha)	-	Rs. 10,520
ii.	Net income (Rs. /ha)	-	Rs. 30,600
iii.	B:C ratio	-	2.90
C.	**Farmer's reaction**	• Very needful technology for rice growers • Nutritional security • Low cost and ecofriendly technology • Good quality grain, useful for family consumption • Generated employment and income after rice crop	

c. Rice fallow chickpea

i) Description of technology:

1. Name of technology	Line sowing of chickpea in rice fallow using happy seeder and aqua-ferti seed drill
2. Farming situation	• Small, marginal and resource poor farmers • Rainfed - Mid and lowland
3. Problem	• Rice fallow lands • Low production and productivity • Low level adoption of high yielding varieties • Unawareness of GAPs and modern management strategies • Lack of knowledge in plant protection measures/ technical know-how • Shortage of valid and timely information • Lack of user-friendly and readymade knowledge tools • Lack of suitable cultivars • Poor crop stand and establishment • Diseases and pests stress • Nutrient management • Micronutrient deficiencies • Terminal moisture/heat stress • Non-availability of quality seeds • Lack of mechanization • Inefficient transfer of technology

4. Potential solution	• Off farm trails to evaluate cultivars • Tillage machines, sowing methods, seed priming, higher seed rate, timely planting, seed treatment with fungicides • Persuasion and motivation for adopting recommended IPM modules • Foliar spray of urea/DAP to supplement N and P • Residue mulching • Village based Seed Production Units • Tillage machines, zero-till planter and harvester, Happy seeder, Conservation agriculture • Innovative farmer's participatory approach and ICT tools • Introducing rice-pulse cropping system. • Dissemination of GAPs in rice-pulse cropping system • Increasing knowledge and awareness in scientific rice and pulse production through knowledge tools. • Capacity building of tribal farmers using demonstration, trainings and workshops. • Drudgery reduction tools
5. Nature of intervention	• Rice-pulse cropping system • Participatory mode • Eco-friendly • low cost and • User-friendly technologies • Technical guidance and support
6. Source of technology	ICAR - NIBSM, ICAR - IARI, ICAR - IIPR, ICAR - CIAE, SAUs, Farmer innovations, CG State Beej Nigam
7. Expected output	• Village based seed production units • Multiplication and distribution of farmer preferred pulse varieties • Educational Multimedia Training Modules (EMTMs) on rice-pulse cropping system and Good Agricultural Practices (GAPs). • Increased knowledge and awareness level in rice fallow pulse production • Enhanced nutritional and livelihood security of tribal farmers • Digital knowledge tools on rice-pulse cropping system and GAPs

	• Increased adoption rate towards sustainable cultivation practices • Positive attitude changes towards rice-pulse cropping system • Suitable Livelihood model for tribal farming • Reduced input cost and increased yield • Digitalized ITKs practices • Training modules
8. Area (ha)	12.20 ha.
9. No. of farm families	42 farm families
10. Critical input	Seed, agro chemicals, fertilizers, farm machineries, labour,
11. Crop and variety	Chick pea, Variety: Vaibhav, JG - 11 and 12
12. Cost of each intervention	Approximately 1.0 lakhs

ii) Performance Indicators

a.	Technical Observation	Farmer's practice	Intervention
i.	**Yield** (q/ha)		
a.	Grain(q/ha)	First time introduced	16.40 Qu.
b.	Straw(q/ha)	-	7.20 Qu.
ii.	Total water use (m^3ha^{-1} water)/Water productivity (kg grain m^{-3})/Water use efficiency (q grain/ha/cm) ***In case of Ridge and Furrow/BBF/Laser land leveling/Zero tillage**		
B.	**Economic indicators**	-	
i.	Cost of cultivation (Rs./ha)	-	Rs. 13,250/-
ii.	Net income (Rs./ha)	-	Rs. 53,750/-
iii.	B:C ratio	-	4.05
C.	**Farmer's reaction**	• Very needful technology for pulses production • Low-cost technology • Nutritional security, additional income • Good quality seed and yield • Generated employment and income after rice crop • Convey to other farmers for rice-fallow pulses • Soil and water conservation technology	

d. Rice fallow Mustard

i) Description of technology

1. Name of technology	Scientific mustard production in rice fallow
2. Farming situation	• Small, marginal and resource poor farmers • Rainfed - Mid and lowland
3. Problem	• Rice fallow lands • Low production and productivity • Low level adoption of high yielding varieties • Unawareness of GAPs and modern management strategies • Lack of knowledge in plant protection measures/ technical know-how • Shortage of valid and timely information • Lack of suitable cultivars • Diseases and pests stress • Nutrient management • Terminal moisture/heat stress • Non-availability of quality seeds • Lack of mechanization • Inefficient transfer of technology
4. Potential solution	• Improved variety and good quality seed • Tillage machines, sowing methods, seed priming, higher seed rate, timely planting, seed treatment with fungicides • Persuasion and motivation for adopting recommended IPM modules • Village based Seed Production Units • Tillage machines, zero-till planter and harvester, Happy seeder, Conservation agriculture • Innovative farmer's participatory approach and ICT tools • Introducing rice-pulse cropping system. • Dissemination of GAPs in rice-pulse cropping system • Capacity building of tribal farmers using demonstration, trainings and workshops. • Drudgery reduction tools
5. Nature of intervention	• Rice-fallow cropping system • Participatory mode • Eco-friendly

	• low cost and • User-friendly technologies
6. Source of technology	ICAR - NIBSM, ICAR - IARI, ICAR - CIAE, SAUs, Farmer innovations, CG State Beej Nigam
7. Expected output	• Village based seed production units • Multiplication and distribution of farmer preferred pulse varieties • Enhanced nutritional and livelihood security of tribal farmers • Digital knowledge tools on rice-pulse cropping system and GAPs • Increased adoption rate towards sustainable cultivation practices • Positive attitude changes towards rice-pulse cropping system • Suitable Livelihood model for tribal farming • Reduced input cost • Increased yield • Training modules
8. Plot size/area (ha)	5.80 ha
9. No. of farm families	40 farm families
10. Critical input	Seed, agro chemicals, fertilizers, farm machineries, labour,
11. Crop and variety	Mustard, Variety – Pusa Mustard 25 and Chhattisgarh Sarson
11. Cost of each intervention	Approximately 0.30 lakhs

ii) Performance Indicators

a.	Technical Observation	Farmer's practice	Intervention
i.	**Yield** (q/ha)	First time introduced	
a.	Grain(q/ha)		12.80 Qu.
b.	Straw(q/ha)	-	3.60 Qu.
ii.	Total water use (m^3ha^{-1} water)/Water productivity (kg grain m^{-3})/Water use efficiency (q grain/ha/cm) ***In case of Ridge and Furrow/BBF/Laser land leveling/Zero tillage**	-	-
B.	**Economic indicators**	-	

i.	Cost of cultivation (Rs./ha)	-	Rs. 12600
ii.	Net income (Rs./ha)	-	Rs. 42,600/-
iii.	B:C ratio	-	3.38
C.	**Farmer's reaction**	• Low-cost technology • Less care and management • Good quality seed and yield	

3. Technology Assemblage, Application and Feedback
B. Horticulture Based Module

i). Description of technology:

1. Name of technology	Scientific Bitter Gourd production under the shadenet house
2. Farming situation	Small, Medium and big farmers
3. Problem	• Lack of good seed • Biotic stress factors • Abiotic stress factors • Shortage of labour • Climate change • Higher input cost • Price fluctuation • Lack of suitable varieties • Low technical know-how knowledge
4. Potential solution	• Introduction of improved hybrids • Introduction of poly house technology in vegetable production • Drip system • Recycling the farm waste • Application of resource conservation technologies • Capacity building on GAPs
5. Nature of intervention	• Hi-tech orientation • Effective utilization of available resource • Systematic involvement of farming inventory • Availability of quality planting materials
6. Source of technology	ICAR - NIBSM, ICAR - IIVR, ICAR - IIHR, SAUs, and Farmer innovations
7. Expected output	• Higher per unit production • Eco-friendly production • Organic farming orientation • Conservation of resources • Supply chain management • Entrepreneurship development • Less biotic and abiotic stress
8. Plot size/area (ha)	120 m^2
9. No. of farm families	1 farm families
10. Critical input	Seeds, raw material, fertilizers, agrochemicals, growth regulators, interiors and plant protection
11. Crop and variety	Bittergourd, Variety – VNR Kanhaiya

11. Cost of each intervention	Approximately Rs. 10,000/-

ii) Performance indicators

a.	Technical Observation	Farmer's practice	Intervention
	Yield (q/ha)	First time introduced	1.90 Qu./120m^2
b.	**Economic indicators**		
i.	Cost of cultivation (Rs./ha)	-	3600
ii.	Net income (Rs./ha)	-	6800
iii.	B:C ratio	-	1.88
c.	**Farmer's reaction**	• Protected cultivation gives high yield with good quality produce • Less biotic stress and easy to manage the crop in the poly house • Scientific production technology is cost effective, less input cost and high profit • Good keeping quality, test and good price	




Scientific Bitter Gourd Production

c. Scientific Turmeric production with improved variety

i). Description of technology:

1. Name of technology	Scientific turmeric production with improved variety - Roma
2. Farming situation	Small, Medium and big farmers
3. Problem	• Lack of good seed • Biotic stress factors • Abiotic stress factors • Climate change • Higher input cost • Lack of suitable varieties • Low technical know-how knowledge
4. Potential solution	• Introduction of improved variety with scientific package of practices • Recycling the farm waste • Application of resource conservation technologies • Capacity building on GAPs
5. Nature of intervention	• Hi-tech orientation • Effective utilization of available resource • Availability of quality planting materials
6. Source of technology	ICAR - NIBSM, ICAR - IIVR, ICAR - IIHR, SAUs, and Farmer innovations
7. Expected output	• Good quality product with high market value • Higher per unit production • Eco-friendly production • Conservation of resources • Supply chain management • Entrepreneurship development • Less biotic and abiotic stress
8. Plot size/area (ha)	4.30 ha.
9. No. of farm families	80 farm families
10. Critical input	Seeds, raw material, fertilizers, agrochemicals, growth regulators, interiors and plant protection
11. Crop and variety	Turmeric, Variety - Roma
11. Cost of each intervention	Approximately Rs. 40000/-

ii) Performance indicators

a.	Technical Observation	Farmer's practice	Intervention
	Yield (q/ha)	22	28.50
b.	**Economic indicators**		
i.	Cost of cultivation (Rs./ha)	25,300/-	24,400/-
ii.	Net income (Rs./ha)	77,500/-	1,16,000/-
iii.	B:C ratio	3.06	4.75
c.	**Farmer's reaction**	• Very good crop and quality rhizome as compared to local variety, High market value • Less biotic stress and easy to manage the crop • Scientific production technology is cost effective, less input cost and high profit	




Production and processing of Turmeric

1. For new plantation/ Orchards

A. Growth of new orchards plants

Plant Type (Fruit)	Age	Average plant height (cm)	Average girth in cm (circumference)
Guava	8 months	95	4
Mango	8 months	90	3
Lemon	8 months	55	2
Jack fruit	8 months	110	4

B. Survival of new orchards plant

Name of Farmer		Jaikishno Kanwar		Ghanshyam Kamalwanshi	
Village		Kharri		Bakla	
Crop Name		**Plantation**	**Survival**	**Plantation**	**Survival**
1.	Guava	70	53	30	24
2.	Mango	40	34	35	23
3.	Jack fruit	40	32	25	17
4.	Lemon	60	48	35	22
5.	Custard apple	60	47	30	23

3. Technology Assemblage, Application and Feedback

C. NRM based module

i) Description of technology

1. Name of technology	Low-cost Azolla production
2. Farming situation	• Small, marginal and landless farmers, rainfed area
3. Problem	• Lack of green fodder for livestock • Mono cropping • Very low level of knowledge /adoption of soil and water conservation technologies • Lack of awareness on conservation of biodiversity and importance in sustainability of homestead system • Subsistence nature of farming
4. Potential solution	• Biological measures • Sustainable and easy technology • Agronomical measures • Recycling of resources • Participatory farm planning and implementation
5. Nature of intervention	• Water and soil conservation measures • Common resource generation for conservation • Community approach
6. Source of technology	ICAR - NIBSM, SAUs, and Farmer innovations
7. Expected output	• Maximizing output per unit area • Regular and sustainable feed availability • Yield and income improvement through water and soil conservation • Resource use efficiency and climate adaptations • Effective recycling of farm resources
8. Area (ha)	14 units
9. No. of farm families	14 farm families
10. Critical input	Low-cost azolla production unit, micro-irrigation models, water/soil conservation tools and techniques, polythene sheets, civil works
11. Crop and Variety	Azolla
12. Cost of each intervention	Approximately Rs. 0.25 lakhs

ii) Performance Indicators

a.	Technical Observation	Farmer's practice	Intervention
i.	**Yield** (q/ha)	First time introduced	3.20 Quintal/unit/year
a	**Grain (q/ha)**	-	-
b	**Straw (q/ha)**	-	-
ii.	Total water use (m^3ha^{-1} water)/Water productivity (kg grain m^{-3})/Water use efficiency (q grain/ha/cm) ***In case of Ridge and Furrow/BBF/Laser land leveling/Zero tillage**	-	-
B.	**Economic indicators**		
i.	Cost of cultivation (Rs./ha)	-	380/year/unit
ii.	Net income (Rs./ha)	-	2820
iii.	B:C ratio	-	7.42
C.	**Farmer's reaction**	• This is very useful for poultry, livestock and rice field • Very less investment and management, • Very nutritive poultry and goat feed. • This technology help to ensure fodder availability	

3. Technology Assemblage, Application and Feedback
D. Livestock based module

a. Kadaknath Poultry Farming

i) Description of technology

1. Name of technology	Kadaknath poultry farming and hatching of Kadaknath eggs
2. Farming situation	• Small, marginal, landless and resource poor farmers • Rainfed - Mid and lowland
3. Problem	• Fallow land • Monoculture cropping system (Rice) • Lack of suitable breeds • Low production and productivity • Lack of alternative livelihood option • Resource poor and subsistence farming • Poor marketing network • Lack of value addition • Low awareness level • Migration
4. Potential solution	• Introduction of Kadaknath poultry breed • Introduction of new and suitable backyard poultry breeds • Established *Kadaknath* farming cum hatchery unit
5. Nature of intervention	• Integration of livestock components maximizing income • Participatory resource sharing • Participatory experiment and technology development • Evolving location specific models of technology options • Sustainable production and farming model
6. Source of technology	ICAR - NIBSM, ICAR-NDRI, SAUs, SVUs, KVKs and Farmer innovations
7. Expected output	• Increased family income • Alternative and sustainable livelihood option • Reduction in cost of production • Increased standard of living
8. No. of animals/birds	1500
9. No. of farm families	02 farm families
10. Critical input	Back yard poultry breeds, vaccines, veterinary medicines, feed materials, small civil structures (poultry shed).
11. Name of breed/species	Kadaknath
12. Cost of each intervention	Approximately Rs. 1.20 lakhs

Ii) Technical indicators

a.	Technical Observation	Farmer's practice (Desi Breed)	Intervention
i	**Average body weight (kg)**	1353 kg	1464 kg
ii	**No. of fingerlings/ Average egg production /month/ Average milk yield/day**	Total egg - 142	Total egg - 623
b.	**Economic indicators**		
i.	Cost of production	132900	225400
ii.	Net income (Rs.)	279100	8,88,175
iii.	B:C ratio	2.10	3.94
c.	**Farmer's reaction**	• Kadaknath is high value chicken with medicinal property, getting high price • Useful for the backyard and commercial farming • Helpful to improve economic condition of resource poor and land less triable farmers • Best intervention as alternative livelihood option • Double market value as compared to desi breed.	

Poultry Health camp

Particulars	No. of villages covered	No. of activities	No. of farmers covered	no. of animals covered
Vaccination and health awareness programme conducted	05	03	03	1340




Kadaknath poultry farming and hatching of Kadaknath eggs at Village Hatchery Units (VHUs)

3. Technology Assemblage, Application and Feedback
E. Enterprise based module

a. Paddy straw mushroom production

i) Description of technology

1. Name of technology	Paddy straw mushroom production technology
2. Farming situation	Small, marginal, landless and resource poor farmers. Rice cropping system
3. Problem	• Land less farmers • Mono-cropping • Inability to higher investment • Lack of alternative livelihood option • Resource poor in nature • Lake of marketing network • Low awareness
4. Potential solution	• Introduction of small-scale Mushroom production units • Converting paddy straw into nutritional security and income • Recycling the farm waste through the Vermi-compost production
5. Nature of intervention	• Recycling of farm waste • Participatory resource sharing • Participatory experiment and technology development • Evolving location specific models of technology options • Involvement of rural youth and farm women
6. Source of technology	ICAR - NIBSM, SAUs, and Farmer innovations
7. Expected output	• Supply chain management • Nutritional security • Entrepreneurship development • Increased family income • Alternative livelihood option • Reduction in cost of production
8. No. of units	02 units
9. No. of farm families	02 farm families
10. Critical input	Spawn, chemicals, equipment, training and other raw material.
11. Cost of each intervention	Approximately 10,000/-

ii) Performance indicators

a.	Technical Observation	Before	After
	Yield (q/unit)/ Average body weight (kg)/ No. of fingerlings/ Average egg production /month/ Average milk yield/day	28 kg/ unit	42 kg/ unit
b.	**Economic indicators**		
i.	Cost of cultivation (Rs./ha)	1650	1850
ii.	Net income (Rs./ha)	6750	8650
iii.	B:C ratio	4.00	4.67
c.	**Farmer's reaction**	• No specific structure required • Low cost and easy and useful technology • Best utilization and income generation from waste paddy straw • Employment generation for farm women and rural youth • Highly nutritive and good market price • Farmers are excited to see the mushroom production technology at remote triable villages	

	
Paddy Straw Mushroom Production	

b. Oyster mushroom production

i) Description of technology

1. Name of technology	Oyster mushroom production technology
2. Farming situation	Small, marginal, landless and resource poor farmers. Rice cropping system, mono-cropping
3. Problem	• Land less farmers • Inability to higher investment • Lack of alternative livelihood option • Resource poor in nature • Lake of marketing network • Low awareness
4. Potential solution	• Introduction of small-scale Mushroom production units • Ensure availability of spawn, raw materials and technical know how • Establishment of small-scale mobile apiary units • Recycling the farm waste through the Vermi-compost production
5. Nature of intervention	• Recycling of farm waste • Participatory resource sharing • Participatory experiment and technology development • Evolving location specific models of technology options
6. Source of technology	ICAR - NIBSM, ICAR-DMR, SAUs, and Farmer

	innovations
7. Expected output	• Supply chain management • Entrepreneurship development • Increased family income • Alternative livelihood option • Reduction in cost of production
8. No. of units	02 units
9. No. of farm families	02 farm families
10. Critical input	Spawn, agrochemicals, raw materials, equipments, tools, shed and raw material
11. Cost of each intervention	Approximately Rs. 10,000/-

ii) Performance indicators

a.	**Technical Observation**	**Before**	**After**
	Yield (q/unit)/ Average body weight (kg)/ No. of fingerlings/ Average egg production /month/ Average milk yield/day	58 kg/unit	60kg/unit
b.	**Economic indicators**		
i.	Cost of cultivation (Rs./ha)	2650	2900
ii.	Net income (Rs./ha)	10110	11300
iii.	B:C ratio	3.81	3.89
c.	**Farmer's reaction**	• Farmers are excited to see the mushroom production technology at remote triable villages • Best utilization and income generation from waste paddy straw • Employment generation for farm women and rural youth • Highly nutritive and good market price	

Oyster Mushroom Production

c. Agro-Processing Center (APCs)

i) Description of technology

1. Name of technology	Processing and value addition of agro produce – Rice, flour, oil, pulses and spices.
2. Farming situation	Small, marginal, landless and resource poor farmers. Rice cropping system, Rice-fallow pulses and oil-seed crop
3. Problem	• Land less farmers • Inability to higher investment • Lack of alternative livelihood option • Resource poor in nature • Lake of marketing network • Migration
4. Potential solution	• Introduction of small scale Agro Processing Center (APCs) • Processing and value addition of cereals and spices • Participatory approach • Value chain • Marketing linkage
5. Nature of intervention	• Establishment and operation of Agro Processing Centers • Participatory resource sharing • Participatory experiment and technology development • Evolving location specific models of technology options
6. Source of technology	ICAR - NIBSM, ICAR-CIAE, SAUs, and Farmer innovations
7. Expected output	• Value addition of cereals and spices • Supply chain management • Entrepreneurship development • Increased family income • Alternative livelihood option • Reduction in cost of production
8. No. of units	02 units
9. No. of farm families	06 farm families
10. Critical input	Establishment of Processing Units, (PKV Dal mill, Mini flour mill, mini rice mill, rice cum flour mill, pulverizer and mini oil expeller machine)
11. Cost of each intervention	Approximately Rs. 5.50 lakhs

ii) Performance indicators

a.	Technical Observation	Before	After
	Yield (q/unit)/ Average body weight (kg)/ No. of fingerlings/ Average egg production /month/ Average milk yield/day	3420 kg/unit	5800 kg/ unit
b.	**Economic indicators**		
i.	Cost of cultivation/ production (Rs./ha/unit)	5200	14400
ii.	Net income (Rs./ha/unit)	15320	43500
iii.	B:C ratio	2.94	3.02
c.	**Farmers reaction**	• Helpful enterprise for the landless and small farmers • Easily operated by farm women • Employment generation for farm women and rural youth • Income generation and livelihood option at village level. • Value addition of Turmeric and Lathyrus at village level	

Agro- Processing Centers (APCs),
Established - PKV Dal Mill, Mini Rice Mill, Flour Mill, Mini Oil Expeller Machine and Pulverizer

3. Technology Assemblage, Application and Feedback

F. ICT based module

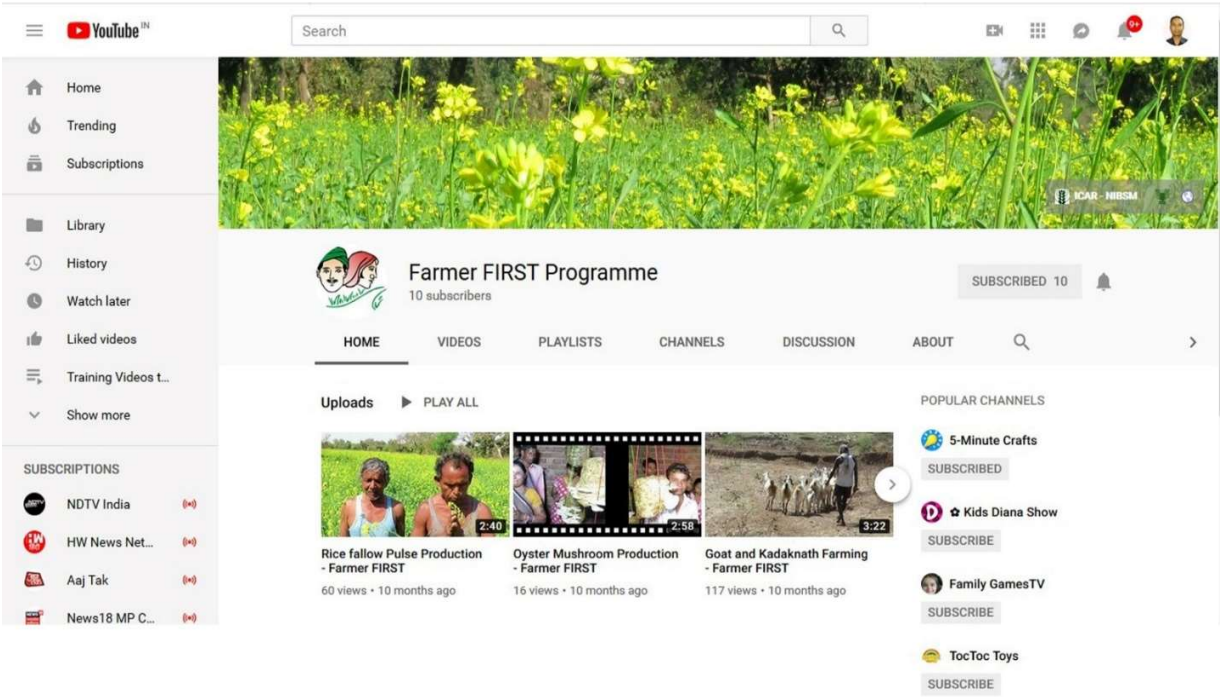
Module	Whats App			No. of calls		No. of Text message	No. of villages covered	No. of Farmers covered
	No. of chats	No. of videos	No. of clips	Outgoing	Incoming			
Crop modules	627	176	108	740	575	286	05	**1452**
Horticulture	485	129	137	595	520	123	05	**1047**
Livestock	271	54	78	322	240	50	05	**639**
Enterprise	98	75	76	228	159	25	05	**143**
NRM	171	5	55	297	127	0	05	**383**
Total								

- More than 54 promising agricultural technologies popularized and disseminated in the farmers field (https://ffp.icar.gov.in/project_detail_inst).
- To disseminate the latest agricultural technologies and to provide need-based information created whatsapp group, facebook page and YouTube channel, in this more than 2545 message, photos and videos circulated and 634 farm families covered under the ICT based module.
- As a part of capacity building, 61 training, 72 demonstration, group discussion, online interface and farmers meetings conducted on the field level issues during the COVID-19, scientific rice cultivation, post-harvest management, Kadaknath poultry farming, hatching of Kadaknath eggs, preparation for upcoming Kharif season, empowerment of migrant labours, scientific turmeric cultivation, mushroom production, eco-friendly pest management, scientific package of practices and rat control measures. In this activity more than 2708 tribal farmers actively participated and benefited.

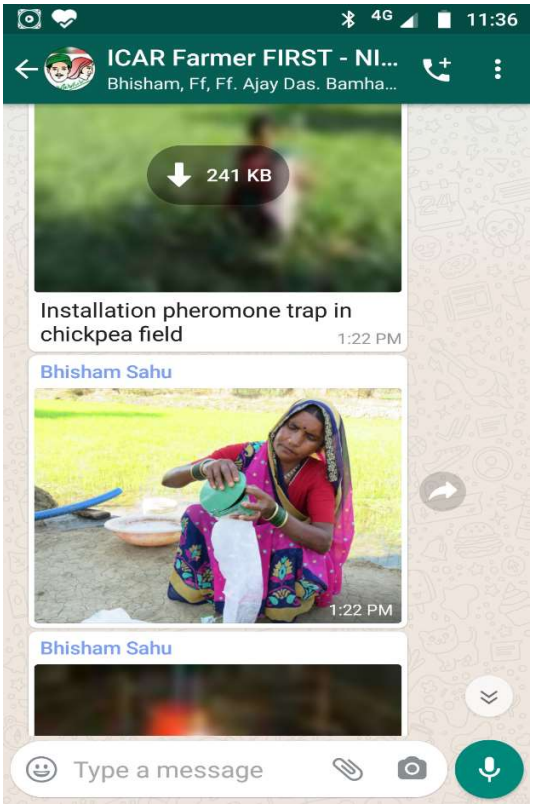
Farmer’s scientist interface through video conferencing

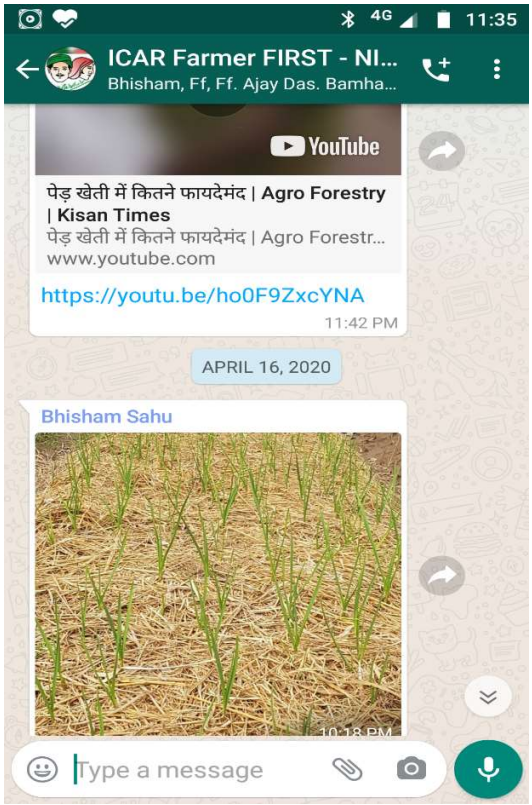
- **Farmer FIRST Facebook page developed**

- **Farmer FIRST You tube channel created**



- **Mobile WhatsApp group created and connected the tribal farmers with latest agricultural technologies.**





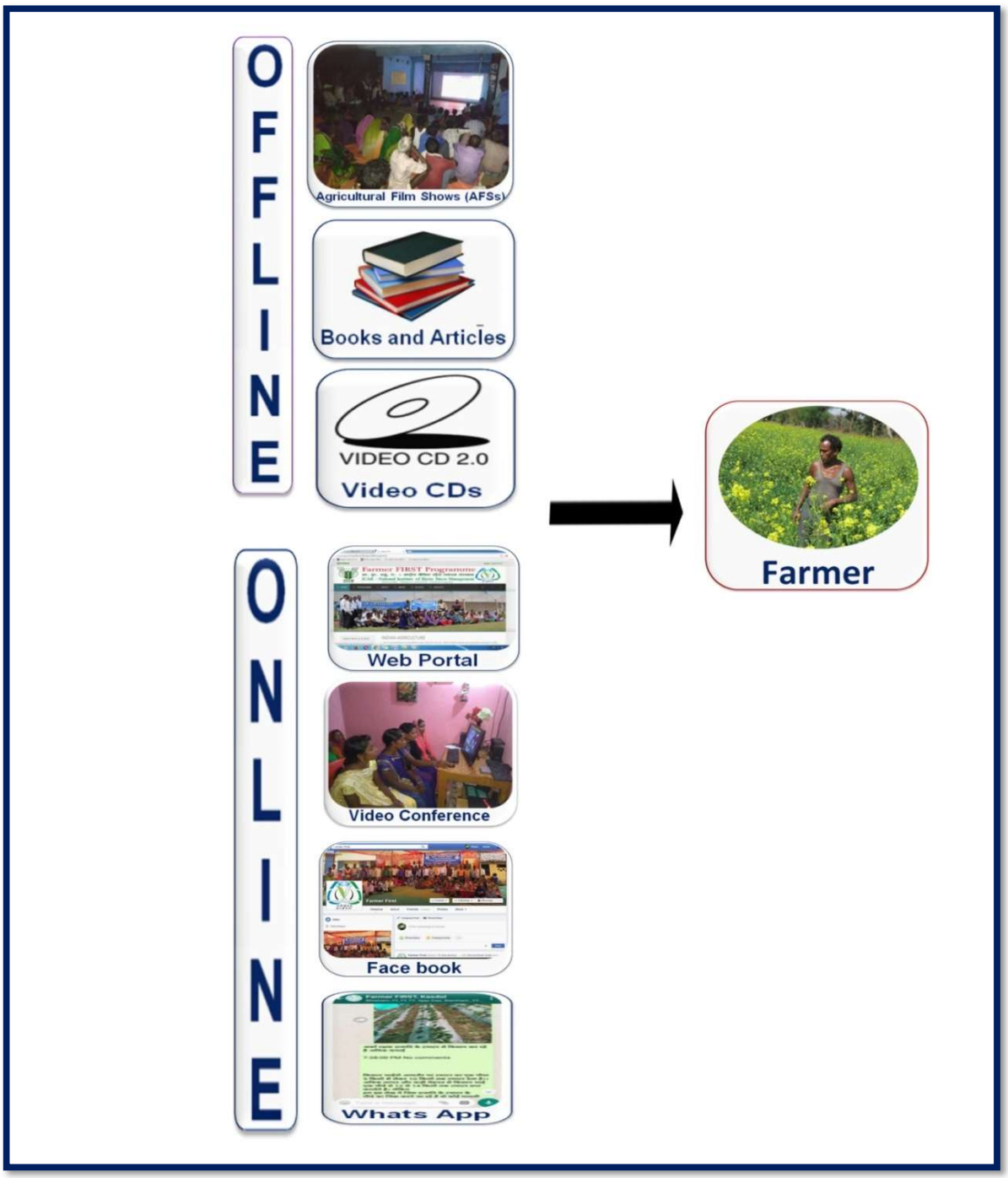
4. Partnership and institution Building:

- Identification and pooling of available transferrable technologies available with different institutions

S. No.	Technologies	Source Institutions	Particulars
1.	Kadaknath farming	KVK, Kanker C. G.	• Procurement of Kadaknath chicks • Technical guidance and support • Exposure visits and training
2.	Scientific Turmeric Production	IGKVV, Raipur, C.G.	• Procurement of planting material/seeds
3.	Establishment of fruit orchard	IGKVV, Raipur, C.G.	• Procurement of planting material/plant saplings
4.	Hi- tech horticulture	IGKVV, Raipur, C.G.	• Procurement of planting material/ plant saplings/seeds • Training and exposure visit with farmers on protected cultivation of horticulture crops • To establish soil less farming model • Nutritional gardening
5.	Vegetable Production	IIHR, Bangalore, TNAU, Coimbatore and National Seed Corporation (NSC)	• Procurement of Improved F1 hybrid seeds • Arka mega seed kit for the establishment of nutritional home gardening
6.	Quail Farming	KVK, Mahasamund	• Procurement of Quail chicks • Technical guidance and support • Exposure visits and training
7.	Goat farming	CGKV, Durg, C.G.	• Guidance on scientific goat and poultry farming practices and goat

			breed improvement programme
		State Vet. Department, Kasdol	• Vaccination programme • Animal/poultry health camp • Training and capacity building programme
8.	Custom Hiring Centres (CHCs)	C G State Beej Nigam, Raipur, C.G.	Procured drudgery reduction Agriculture Equipments for CHCs
9.	Pulses Production	C G State Beej Nigam, Raipur, C.G.	Procured improved varieties of pulses for this region
10	Mushroom Production	IGKVV, Raipur, C.G.	Got valuable help, training, guidance and materials for oyster and paddy straw mushroom production
11.	Kadaknath Hatchery Unit	KVK, Kanker	Procured Kadaknath hatchery units and established at FFP village
12.	Bio-control agents	IGKVV, Raipur, C.G.	Procurement of bio-control agents such as – Trichocard, *Trichoderma, Pseudomonas, Metarhizium* culture and biofertilizers

5. Content Mobilization:
• Development of information system, database



6. Success story:
• Success stories under FFP -

1. Scientific Rice Cultivation with improved varieties

Module:	Crop Based Module
Name of the Intervention:	Scientific Rice Cultivation with improved varieties
Focus area:	Small and marginal farmers
Challenge:	Mono cropping, Rainfed area, non-availability of good seed, lack of technical know-how knowledge, lack of mechanization, high biotic stress, higher input cost and low production
Process:	• Under FFP we conducted a field-level survey & need analysis and we found that farmers were following traditional methodology i.e., direct seeding in the dry field (DSR) and high-density planting in the rice farming. • We found that farmers were using locally available seeds, and facing problems like – low productivity, high biotic stress and low-quality produce • Due to the DSR and high-density planting farmer were facing problem of high biotic stress and high input cost • Based on the farmer's feedback and interest we Introduced and demonstrated improved high yielding rice varieties such as Chandrahasini, IGKV R-1, IGKV R-2, Indira Aerobic, Swarna, HMT, and Mahamaya and drought tolerant variety Indira barani. • Procured the quality seeds from IGKV and Chhattisgarh Rajya Beej Nigam, Raipur and provided to farmers • All package of practices such as - field preparation, seed treatment, nursery preparation, line transplanting, interculture operations, plant protection measures and post-harvest technologies. • All scientific and proven technologies were practiced during the crop (like – mechanical weed management, use of Azolla, eco-friendly pest management technologies, nutrient management) • Trichocard were installed and demonstrated for eco-friendly management of rice stem borer. • Under this technology we covered 54.00 hectare of area and 76 farm families were benefited
Impact and Lessons	• Due to scientific package of practices, the crop was very good and healthy and farmers were also excited to see the crop, and after

Learnt:	the short period, we received very good yield with the good grain quality. • Biotic stress was very less as compared to normal practice, input cost also reduced because of Mechanization, IPM and eco-friendly pest management technologies • Neighbor farmers were also excited and happy to see the crop, on the basis of this experience farmers will expand the technology for the next Kharif season
Economics:	Yield per hectare Grain – 42.10 Quintal and Straw 62 Quintal, Gross income = 82,447 – 18,810 (cost of cultivation) = Rs. 63,937/- Net profit per hectare

2. Scientific Turmeric Production with improved variety

Module:	Horticulture Based Module
Name of the Intervention:	Scientific Turmeric Production with improved variety - Roma
Focus area:	Small and Marginal farmers
Challenge:	Biotic and Abiotic stress factors, Shortage of labour, lack of suitable varieties, low technical know-how knowledge, climate change
Process:	• In the FFP villages farmers were practicing the turmeric production in the traditional way with the locally available variety. We found that farmers are not getting proper production due to high insects and disease infestation, and because of poor quality rhizome they were not getting good price. • To solve this issue, we have introduced and demonstrated improved turmeric variety - Roma, with scientific package of practices. Quality seed procured from the IGKV, Raipur and provided to farmers. • Farmers were followed scientific package of practices, under the monitoring and guidance of FFP team. • Because of improved variety and scientific practices, increased productivity, reduced input cost and received very good quality rhizome with good yield. • Training cum demonstration organized on the post-harvest

	technology, farmers followed the technology and processing were done in the village level Agro-processing Centers. Since farmers are getting quality produce and they are planning for the value addition and branding through APCs.
Impact and Lessons Learnt:	• Farmers learned the scientific production technologies and practices • Received good quality rhizomes with good yield • Farmers were happy to see the good quality product. • Value addition of dry rhizome at Agro-processing Centers were helped farmers to get more profit.
Economics:	Yield per hectare - 28.50 Quintal rhizome, Gross income = 1,40,400 – 24,400 (cost of cultivation) = Rs. 1,16,000/- Net profit per hectare

3. Kadaknath poultry faming cum hatchery unit

Module:	Livestock Based Module
Name of the Intervention:	Kadaknath poultry faming cum hatchery unit
Focus area:	Small, marginal, landless farmers, farm women and resource poor farmers
Challenge:	Resource poor and subsistence farming, Lack of alternative livelihood option, lack of suitable breed, monoculture cropping system (Rice) and low awareness level, migration is major problem
Process:	• To strengthen the Kadaknath farming cum hatchery unit we have provided 1500 Kadaknath chicks 02 Kadaknath farming group and hatchery unit were established • Training and capacity building programmes on scientific farming practices, feed management, housing management, vaccination, breeding and marketing management organized • Farmers started the farming in scientific manner, in the village level hatchery units, more than 680 Kadaknath eggs were hatched and sold to nearby farmers. • Created marketing linkage for the selling of Kadaknath chicken,

	eggs and chicks.
Impact and Lessons Learnt:	Kadaknath farming is the highly remunerative livelihood option for the tribal farmers. After the scientific farming and management practices we received 1000 to 1200 gms of body weight with in the 90 days, initial mortality rate was approximate 10% 1500 – 150 = 1350
Economics:	Total body weight = 1464 kg X 750 = 10,98,000 Total egg = 623 x 25 = 15,575 Gross income = 10,98,000+15,575 = 11,13,575/- Cost of production = 2,25,400/- = Net income = 11,13,575 – 2,25,400 = 8,88,175

4. Paddy straw mushroom production technology

Module:	Enterprise Based Module
Name of the Intervention:	Paddy straw mushroom production technology
Focus area:	Farm women, rural youth, resource poor small and marginal farmers.
Challenge:	Land less farmers, inability to higher investment, Resource poor and subsistence farming, Lack of alternative livelihood option, and low awareness level
Process:	• Our all farmers are rice grower and they used to leave and burn the paddy straw at the field after harvesting. • To utilize this paddy straw and involve the rural youth and farm women after the sowing of Kharif rice, we introduced paddy straw mushroom production technology for the income generation in the low-cost model • Started the mushroom production under the tree shadow nearby the farmer's field and home • Hands-on training and demonstration organized at the village level • Based on the farmer's interest we established two model mushroom production unit at FFP village and two mushroom

	producer group of farm women and rural youth created • Spawn and other required raw materials also provided to the farmers • Training and other capacity-building programme organized at village level and guided farmers to start mushroom production for alternate income generation and nutritional security • Paddy straw mushroom production became popular among the tribal farm families, due to easy production technology. In both the units we received very good production.
Impact and Lessons Learnt:	• In a very short time and very low investment we received very good production and sold to the local market at a good price, farmers used mushroom for their family consumption also. • Other farmers also expressed their interest to start mushroom production because of less investment and management
Economics:	Total production 42kgx250/kg = 10500 – 1850 (cost of production) = Rs – 8650/- Net income generated from the single unit in two months

5. Application of waste decomposer in the rice and vegetable field

Module:	NRM Based Module
Name of the Intervention:	Application of waste decomposer in the rice and vegetable field
Focus area:	Rice and vegetable growers
Challenge:	Mono cropping, very low level of knowledge/adoption of soil and water conservation technologies, low soil fertility, Inability to higher investment, low fertility and Algae proliferation
Process:	• Algae proliferation was a major problem among the rice grower, and because of this farmer were getting problem to perform their intercultural activities and poor production/on. In order to enhance the soil health, to increase the productivity of rice and control the Algae proliferation we introduced Waste Decomposer Culture to the rice field after the • Our innovative farmers mixed 10 litres of cow urine and 200 litres

	of waste decomposer culture and applied to the rice field. • First application done 30 days after the plantation and second 60 DAS. • In between farmer operated paddy weeder four times in the 15 days interval for mechanical weed management. • After this practice we found that all algae and weeds are decomposed and crop growth and panicle initiation was increased. • In addition, farmers used waste decomposer culture in vegetable field to improve the soil fertility and to increase the microbial activity.
Impact and Lessons Learnt:	• After the application of this practice, we received very good and healthy crop with high yield • This technology has reduced the input cost and application of access fertilizer. • In vegetable field also it performed well to increase soil fertility, farmers received healthy crops with minimum chemical fertilizer. • We got much difference among the nearby rice crop in other field, neighbor farmers were also excited and other farmers also visited the field in between
Economics:	In the rice field approximately Rs. 2000/acre and vegetable field Rs. 2200/acre of input cost saved because of this eco-friendly technology and received good healthy crop.

7. Publications

Publication under the Farmer FIRST Project

1. Extension Folders

- P. Mooventhan, G. L. Sharma, Uttam Singh, Bhisham Kumar, and Satish Xaxa.2021. पॉलीहॉउस में संरक्षित सब्जी पौध उत्पादन तकनीक (Nursery raising technique under polyhouse). PME No. ICAR – NIBSM, NIBSM/EF/2021-59.
- P. Mooventhan, G. L. Sharma, Uttam Singh, Bhisham Kumar, and Satish Xaxa.2021. पौधों में आवश्यक तत्व एवं उनके कार्य (Major plant nutrients and their work). PME No. ICAR – NIBSM, NIBSM/EF/2021-60.

2. Popular Article

- P. Mooventhan, Uttam Singh, Satish Xaxa, Rewendra Sahu and Manoj Kumar. 2022.ग्रीष्मकालीन धान में तना छेदक कीट-जानकारी एवं नियंत्रण. Krishi World. January, Vol-06, PP - 14.

3. FFP Photo Atlas on

Farmer FIRST Innovation

A role model for doubling of Chhattisgarh tribal farmers income

Contents

प्रयोग किया जा सकता है जैसे गार्डन मिश्रण, फूलों की क्यारियों हेतु, लान में प्रयोग हेतु।

(5) जीवाणु/बीजाणु मुक्त : यह मिश्रण प्रायः कीट एवं बीमारियों से मुक्त होता है अतः पौधगलन जैसी बीमारियाँ कम आती हैं।

इस प्रकार इस मिश्रण का प्रयोग करते हुए विभिन्न प्रकार के सब्जी बीजों की पौध तैयार की जाती है पौध तैयार करने के लिए मिश्रण तैयार कर प्रो–ट्रे में भर दिया जाता है। फिर ट्रे के प्रत्येक कोष/छेद में एक बीज बोया जाता है तथा बाद में बीज के ऊपर वर्मीकुलाइट की एक पतली पर्त डाली जाती है और फिर फव्वारे/हजारे की सहायता से हल्का पानी देते हैं फिर ट्रे को एक के ऊपर एक रख देते है। सर्दी के मौसम में प्रत्येक प्रो–ट्रे को अंकुरण कमरे में रखा जा सकता है। जहां का तापमान 25 डिग्री सेंटीग्रेट रखा जाता है ताकि बीजों का अंकुरण जल्दी व ठीक प्रकार से हो सके।

अंकुरण के बाद सभी ट्रे पालीहाउस या अन्य संरक्षित क्षेत्र में बने प्लेटफार्म या फर्श पर फैलाई जा सकती हैं।

अंकुरित हुए पौधों को समय समय पर पानी एवं खाद फव्वारे/हजारे की मदद से दिया जाता है। घुलनशील रासायनिक उर्वरक नर्सरी ग्रेड को पानी के साथ ही पौधों को देते हैं पौधे की प्रारंभिक अवस्था में यह रासायनिक उर्वरक 70 पी.पी.एम. तथा बाद में 140 पी.पी.एम प्रति सप्ताह की दर से दिया जाता है।

इस प्रकार पौधे तैयार होने में 22–30 दिन (मौसम के अनुसार) लगते हैं। तैयार पौध को माध्यम सहित मुख्य खेत में रोपाई की जाती है। यह पौध पैक करके दूरस्थ स्थानों तक भी भेजी जा सकती है।

इस प्रकार संरक्षित सब्जी पौध उत्पादन तकनीक द्वारा पौध उत्पादित कर अच्छी आय प्राप्त की जा सकती है तथा हमारे शहरी क्षेत्रों के आस–पास के बेरोजगार युवाओं को रोजगार के साथ किसानों को स्वस्थ, कीट एवं बीमारी मुक्त ओजस्वी पौध प्राप्त हो सकती है।

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Farmer FIRST

Farmer FIRST Programme
फार्मर फर्स्ट प्रोग्राम
(Agricultural Extension Division)
(कृषि प्रसार विभाग)
Indian Council of Agricultural Research
भारतीय कृषि अनुसंधान परिषद

पॉलीहॉउस में संरक्षित सब्जी पौध उत्पादन तकनीक

ICAR - National Institute of Biotic Stress Management
भाकृअनुप – राष्ट्रीय जैविक स्ट्रैस प्रबंधन संस्थान
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फॉस्फोरस के कार्य :

- यह फॉस्फोप्रोटीन, फाइटिन, फॉस्फोलिपाइड्स तथा न्यूक्लिक अम्ल के निर्माण एवं प्रकाश संश्लेषण में सहायक है जो कोषा विभाजन को प्रभावित करता है का एक अवयव है।
- यह नाइट्रोजन के हानिकारक प्रभाव को कम या उदासीन करता है।
- पौधों के पार्श्व रेशेदार जड़ों के निर्माण में सहायक होता है जो पोषकों के अवशोषण के लिए प्रष्ठीय क्षेत्र को बढ़ाता है।
- फलीदार फसलों की जड़ो में स्थिति ग्रंथियों की संख्या एवं आकार में वृध्दि करता है। जिसके फलस्वरुप अधिक वायुमंडलीय नाइट्रोजन का स्थिरीकरण होता है।
- इससे फूल शीघ्र बनते हैं व दाने/बीज बनाने में सहायता करता है तथा फसल को शीघ्र पकता है।

फॉस्फोरस की कमी के लक्षण :

- पौधे छोटे रह जाते हैं, पत्तियों का रंग हल्का बैगनी या भूरा हो जाता है।
- फॉस्फोरस गतिशील होने के कारण पहले कमी के लक्षण पुरानी (निचली) पत्तियों पर दिखते हैं।
- छलहनी फसलों में पत्तियां का रंग नीला हरा हो जाता है।
- पौधों की जड़ो की वृध्दि व विकास बहुत कम होता है कभी– कभी जड़े सूख भी जाती है।
- अधिक कमी से आलू की पत्तियां प्याले के आकार की दलहनी फसलों की पत्तियां नीले रंग की तथा चैड़ी पत्ती वाले पौधे में पत्तियों का आकार छोटा रह जाता है।

पोटेशियम के कार्य :

- यह उत्प्रेरक का कार्य करता है पौधों के दैहिक कार्यो के लिए आवश्यक है।
- कार्बोहाइड्रेट के स्थानांतरण, प्रोटीन संश्लेषण में संलग्न एन्जाइम्स की सक्रियता बढाने एक महत्वपूर्ण कारक है।
- पोटेशियम पौधों में प्रोटीन के निर्माण में सहायक है व पत्तियों में शर्करा व स्टार्च के निर्माण में भी वृध्दि करता है।
- पौधों की उपापचय सक्रियता से उत्पन्न कार्बनिक अम्लों को उदासीन करता है।
- पोटेशियम अधिक चल होता है अतः नई विभज्योतकों में सामान्य कोशिका विभाजन को बढ़ाता है।
- नाइट्रोजन व फॉस्फोरस से दाने पर होने वाले कुप्रभाव को दूर करता है।
- पौधों की रोग प्रतिरोधी क्षमता में वृध्दि होती है।

पोटेशियम की कमी के लक्षण :

- पत्तियां भूरी व धब्बेदार हो जाती हैं तथा समय से पहले गिर जाती हैं।
- पत्तियों के किनारे व सिर झुलसे दिखाई पड़ते हैं।
- इसी कमी से मक्का के भुट्टे छोटे, नुकीले तथा किनारों पर दाने कम पड़ते हैं। आलू में कन्द छोटे तथा जड़ों का विकास कम हो जाता है।
- पौधों में प्रकाश–संश्लेषण की क्रिया कम तथा श्वसन की क्रिया अधिक होती है।

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पौधों के आवश्यक तत्व एवं उनके कार्य

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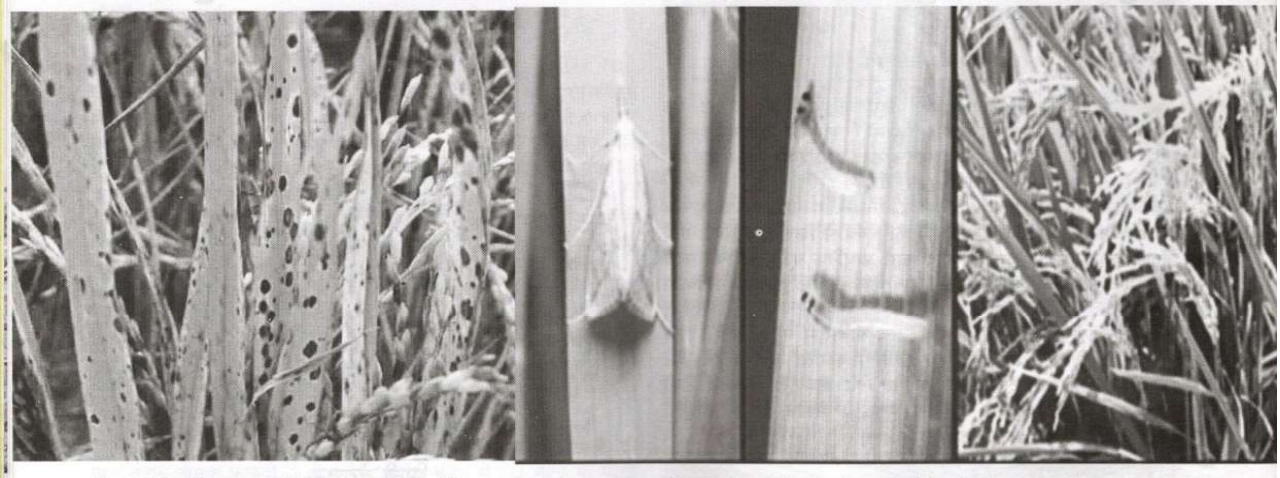
धान रोग

ग्रीष्मकालीन धान में तना छेदक कीट-जानकारी एवं नियंत्रण



• **डॉ. पी मूवेंथन, उत्तम सिंह, सतीश खाखा, रेवेंद्र साहू एवं मनोज कुमार**
भाकृअनुप-राष्ट्रीय जैविक स्ट्रैस प्रबंधन संस्थान, बरोंडा, रायपुर

तनाछेदक कीट विश्वस्तर पर धान का सबसे गंभीर कीट है तथा छत्तीसगढ़ में भी इसका प्रकोप सभी क्षेत्रो में देखा जा सकता है, धान ही इसका मुख्य भोजन है तथा यह धान को 30 प्रतिशत क्षति पहुँचाता है यह कीट फसल को नर्सरी अवस्था से लेकर परिपक्व अवस्था तक हानि पहुँचाता है। इस कीट के इल्ली (लार्वा) फसल के किसी भी अवस्था में तना में घुसकर उसे काट देता है, जिससे पौधे का तना और पत्ती सुखा हुआ दिखाई देता है। तथा इससे प्रभावित पौधे की बालियाँ सफेद दिखाई देती है जिसे डेडहार्ट कहते हैं, जिसमें दाने नहीं होते और खींचने पर आसानी से अलग हो जाते है, इस कीट का प्रकोप जुलाई से नवम्बर माह तक देखा जाता है। इस कीट का इल्ली ही धान को नुकसान पहुंचाता है, और ज्यादातर कीट फसल की शुरूवाती अवस्था में पौधे को अपना शिकार बना लेता है।

जीवन चक्र:- तनाछेदक के सफल नियंत्रण के लिए इसके जीवन चक्र को समझना अति आवश्यक है जिससे हम समय पर इसकी रोकथाम कर सकें और अपने फसल को सुरक्षित रख सकें।

यह कीट अप्रैल से अक्टुबर माह तक सक्रिय रहता है तथा पूर्ण रूप से विकसित इल्ली धान के ठुंठ मे नवम्बर से मार्च तक सुप्तावस्था में रहता है, तथा मार्च में इसका कोषा अवस्था प्रारंभ होता है और अप्रैल के शुरूवात में इसमें से शलभ (तितली) निकलना प्रारंभ हो जाता है। तदोपरांत शलभ सक्रिय हो जाते हैं तथा समागम (जनन) के पश्चात् पत्ती के निचले भाग में 120-150 अण्डे देती है,जो 2-5 के समुहों में होते हैं तथा प्रत्येक समुह में 60-100 अण्डे होते हैं जो पीले भूरे रंग के बाल या रूई से ढके होते है।

अण्डा प्रभावित पौधे डेडहार्ट- अण्डे 6-7 दिनों में प्रस्फुटित हो जाता है तथा इनमें से छोटे-छोटे काले सिर वाले इल्ली निकलते है, जो शीघ्र ही पौधे के तने के निचले भाग में छेद बनाकर घुस जाते है और यह 16-27 दिनों तक तना को खाता है, इसके कारण हमें पानी के उपर तने में एक छिद्र दिखाई पड़ता है। जिसे देखने पर उसमें इल्ली दिखाई पड़ता है। यह इल्ली 9-12 दिनों में एक शलभ के रूप में विकसीत हो जाता है। इस कीट का जीवन चक्र 31-46 दिनों में पूर्ण हो जाती है अत: किसान भाई इसके जीवन चक्र को समझकर समुचित निगरानी के माध्यम से इसकी पहचान एवं उचित नियंत्रण उपाय कर सकते हैं।

प्रबंधन:-

1. फसल के ठुंठों को नष्टकर दे जिससे उसमें कीट शरण ना ले सके।
2. 2 ग्राम क्लोरोपायरीफॉस दवा प्रति कि. ग्रा. बीज के हिसाब से बीजोपचार करें।
3. निगरानी के लिए फेरोमोन प्रपंच तथा प्रकाष प्रपंच का उपयोग करें जिससे कीट के प्रकोप की स्थिति साफ हो सके।
4. थरहा निकालने के पूर्व कारबोफ्यूरॉन दवा का 2 कि.ग्रा./हे. के हिसाब से उपचार करें।
5. रोपाई से पहले थरहा के उपरी भाग को काटकर नष्ट कर दें ताकि कीट के अण्डे पौधे से अलग हो जाये।
6. नत्रजन उर्वरकों का अत्यधिक उपयोग न करें, नत्रजन का उपयोग लीफ कलर चार्ट के मिलान के आधार परत था सिफारिश मात्रा के अनुसार करें।
7. रोपाई के 30 दिन बाद ट्राइकोग्रमा जैपोनिकम 1-1.50 लाख प्रति हेक्टेयर प्रति सप्ताह की दर से 2-6 सप्ताह तक ग्रसित खेत में छोड़ना चाहिए यह कीट तनाछेदक के अण्डे को नष्टकर देंगे, इसे ट्राइकोकार्ड के रूप सकतें है।
8. आवश्यकतानुसार दानेदार कीटनाशी जैसे कार्बोफ्यूरान 3जी./25 कि. ग्रा./हे., कारटेपहाइड्रोक्लोराईड 4जी./20 कि. ग्रा./हे. या क्लोरोपायरीफॉस 20 ईसी 2 एमएल/लीटर, एसीफेट 75 एसपी 2ग्राम/लीटर पानी या क्विनॉलफॉस 25 एसी 2 एम.एल./लीटर, पानी में मिलाकर छिड़काव करें।

जैविक नियंत्रण सामाग्री जैसे फेरोमोनट्रेप तथा ट्राइकोकार्ड के लिए निम्न संस्थानो से सम्पर्क कर सकतें है।

1. https://nibsm.icar.gov.in
2. www.pestcontrolindia.com
3. www.nbair.res.in
4. www.niphm.gov.in

9. Technologies/interventions introduced and sustained under the FFP

Technologies/interventions introduced and sustained under the FFP -

1. Agricultural Film Shows

2. Agro Processing Centers and Value addition of agro products

3. Low-cost Azolla Production

4. Line sowing through Bhoramdav Seed Drill

5. Bio Fertilizers

6. Biyasi Plough

7. Bordeaux Mixture

8. Custom Hiring Centers (CHCs)

9. Farmer Communication Centers (FCCs)

10. Goat Farming with improved breed

11. Zero tillage through Happy Seeder

12. Aqua Ferti Seed Drill

13. Improved Variety of Pulses and Oil Seeds

14. Kadaknath Poultry Farming

15. Kadaknath Farming Cum Hatchery Units

16. Line Sowing of Pulses and Oilseeds

17. Low Cost Drip System

18. Low-Cost Shade Net House

19. Modern Terrace Gardening

20. Annual Moringa Production

21. Home Nutritional Gardening

22. Oyster Mushroom Production

23. Line sowing through Paddy Drum Seeder

24. Paddy Straw Mushroom

25. Pheromone Traps

26. High-tech horticulture in Poly House

27. Poly Mulching

28. Scientific Pumpkin and ash gourd Production

29. Scientific Nursery Raising Technology

30. Scientific Vegetable Production

31. Seed Treatment

32. Village Soil Testing Unit

33. Trichocard for Eco-friendly Pest Management

34. Use of Biological Fungicide *Trichoderma viride*

35. Bio-logical pesticide through *Metarhizium anisopliae*

36. Utera Cropping of Pulses

37. Vaccination of Poultry and Livestock

38. Multiplication and Application of Waste Decomposer

39. Yellow and Blue Sticky Traps

40. SRI (System of Rice Intensification)

41. Mechanical Weed Management in Rice

42. Plant Propagation Technologies

43. Bund Farming

44. Establishment of Fruit Orchard

45. Strawberry Cultivation under Poly House

46. Flower Cultivation

47. Fodder Crop Production

48. Inter-cropping Techniques

49. Denavaling practice in Banana

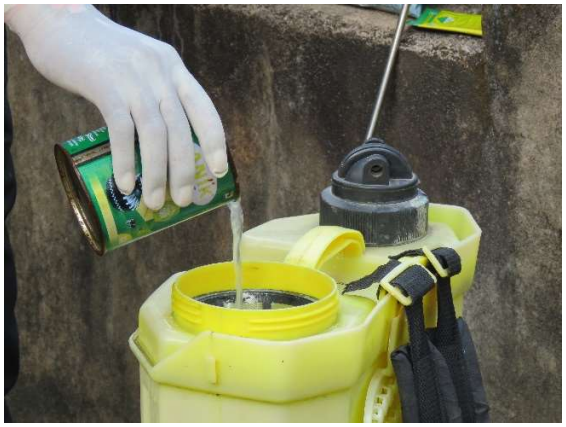
50. Scientific Vegetable Cultivation

51. TNAU Gedgets to control storage pest

52. Popularization and application of Agriculture mobile app and Interactive Educational Multimedia Module (IEMM)

53. Scientific Turmeric Production Technology

54. Safe use of Agro-chemicals



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