

# Annual Progress Report format- 2020-21

## DBT - Biotech- KISAN Hub Project

**Title of the Project- Establishment of Biotech- KISAN Hub at ICAR- NIBSM, Raipur**

**Institute/SAU- ICAR - National Institute of Biotic Stress Management & Indira Gandhi Krishi Vishwavidyalaya - KVKs**

**Background information:** Biotech-Krishi Innovation Science Application Network (Biotech-KISAN) is a Department of Biotechnology, Ministry of Science and Technology initiative that empowers farmers, especially women farmers. It aims to understand the problems of water, soil, seed and market faced by the farmers and provide simple solutions to them.

The Scheme is for farmers, developed by and with farmers, it empowers women, impacts locally, connects globally, is Pan-India, has a hub-and spoke model and stimulates entrepreneurship and innovation in farmers.

**Introduction:** There is a need for direct linkage between science laboratories and farms it is now imperative that the Indian scientist understand the problems of the local farmer and provide solutions to those problems.

Likewise, it is necessary to expose farmers to the scientific solutions available by bringing him to the scientific environment/laboratory. This close interaction and need based research will allow innovative solutions and technologies to be developed and applied at farm level.

**Objectives: To adopt and disseminate the biotech intervention to farmers under Biotech - KISAN project**

Objective wise activities as per action plan

Sr. No.	Objective	Technology Intervened
1.	Popularization of improved rice varieties such as drought tolerant, BHP resistant varieties, nutri-rich varieties (developed through biotechnological approaches).	Distributed Nutri-rich (Bio fortified) Zinco rice variety of high zinc content (more than 26-28 PPM) good for child development and pregnant women.  Cultivation in rain-fed shallow lands with MTU-1010 variety.
2.	Application/use of Bio-agents (like <i>Trichogramma spp.</i> , NPV, BT, <i>Trichoderma viride</i> and <i>Pseudomonas</i> ) along with complete package of practice at farmer's level in rice and pulses.	I. Seed and seedling treatment with Bio fertilizer (Azospirillum, Phosphate Solublizing Bacteria & Trichoderma) II. IWM III. IPM
3.	Demonstration of low-cost protected cultivation if vegetable such as colored capsicum, cucumber and tomato.	• To provided and demonstrated drip irrigation

		<p>system with ventury and mulching film 30 micron to establish the high tech vegetable production.</p> <ul style="list-style-type: none"> <li>To provided and demonstrated the improved vegetables varieties, such as Drumstick (var. PKM-1), Tomato (var. Arka rakshak F<sub>1</sub>), and Cucumber (var. Krish).</li> <li>To provide insect proof net house for protected vegetable cultivation.</li> </ul>
4.	Demonstration of scientific goat farming with the introduction of Sirohi, Jamunapari, Black Bengal and Barbari breeds.	Demonstration of scientific goat farming with the introduction of sirohi breeds.

### Inputs provided to farmers

Sr.no.	Inputs details	Quantity/farmer	No. of farmers benefited	Village
1.	Rice (Zinco Rice MS)+ Biofertilizers (Azopirillum, P.S.B. culture & Trichoderma)	01	13	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha
2.	Rice (MTU-1010)+ Biofertilizers (Azopirillum, P.S.B. culture & Trichoderma)	01	37	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha
3.	Pigeon pea seed (Rajiv Lochan)	01	50	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha
4.	Weedicide ( Bispyribac-sodium 10% SC)+ Pheromone (trap+lure)+ Krishak Panchang	01	23	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha
5.	Weedicide (Pretilachlor 50% EC)	01	27	Sonsaytola, Mangatola, Kodutola,

	+ Pheromone (trap+lure)+ Krishak Panchang			Bhadsena Semharbandha
6.	Fish seeds (Rohu+Katla+Mrigal)+ Fish (Mongar)	8 pkt	05	Sonsaytola, Mangatola, Kodutola, Bhadsena
7.	Krishak Panchang 2021	01	50	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha
8.	Chhattisgarh Kheti (Magazine)	01	50	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha
9.	Goat (Sirohi breed)	5+1 (Female+ Male)	08	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha
10.	Publication folders	02	50	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha
11.	Drip System Installation	01	08	Sonsaytola, Mangatola, Kodutola, Bhadsena
12.	Mulching roll	08	08	Sonsaytola, Mangatola, Kodutola, Bhadsena
13	Vaccination of goat breed for disease management	10	08	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha
14.	Tomato (Arka rakshak F <sub>1</sub> ) seed & seedling	30 gm.	08	Sonsaytola, Mangatola, Kodutola, Bhadsena
15.	Moringa (PKM-1) Seed & seedling	250 plants	08	Sonsaytola, Mangatola, Kodutola, Bhadsena
16.	Plastic wire for stacking	2.5 kg	08	Sonsaytola, Mangatola, Kodutola,

				Bhadsena
17.	Light trap	01	50	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha
18.	Fruit fly catcher for fruit fly insect control of cucurbitaceous crop	05	08	Sonsaytola, Mangatola, Kodutola, Bhadsena

\*Rice (Zinco Rice) x 40kg., Rice (MTU-1010) x 30kg. , Azopirillum-150gm, P.S.B. culture-150gm, Trichoderma- 500gm.

\*Pigeon pea (Rajiv Lochan) x 4 Kg. (Per farmer 1 kg.)

\*Weedicide (Pretilachlor 50 EC - 500ml), Weedicide (Bispyribac-sodium 10% SC - 100ml), Pheromone (Trap+Lure)- 5 Nos /Acre, Krishak Panchang-1

\*Fish seed Packet – 500gm.

### 1. Module-wise interventions carried out

Module	Intervention	Villages covered	Area covered (ha)/ Animal (No.)	Number of Households covered
<b>Crop based module</b>	We provided problem specific varieties such as drought tolerant, nutri- rich rice variety, insect and disease resistant varieties of rice to the farmers.	05	20 ha.	50
	Transplanting and line sowing method of paddy	05	20 ha.	50
	Conducted training on cultivation practices of pigeon pea (Rajiv Lochan) on rice bund condition	05	-	50
	Organized training programme on safe handling and spraying of weedicide Pretilachlor 50 EC 500 ml/acre pre-emergence herbicide for transplanted rice and for DSR Post Emergent, Bispyribac Sodium 10% SC.	05	20 ha.	50
<b>Horticulture based</b>	To provide drip irrigation system with ventury and plastic mulching film 30	04	3.23	08

<b>module</b>	micron to establish the high tech vegetable production.			
	To provided and demonstrated the improved vegetables varieties, such as Drumstick (var. PKM-1), Tomato (var. Arka rakshak f <sub>1</sub> ), Cucumber (var. Krish).	04	3.23	08
	Training and demonstration conducted on control of fruit fly on cucurbitaceous crop by use of fruit flies lures and fruit fly catcher	04	3.23	08
	Training and demonstration conducted on insect light trap.	04	3.23	08
	Training and demonstration conducted on stacking in vegetable crops.	04	3.23	08
	Conducted training and demonstration conducted on fertigation schedule of vegetable crops.	04	3.23	08
	Conducted training on safe handling and timely application of insecticides.	04	3.23	08
<b>NRM based module</b>	Conducted demonstration and training programme for Seed treatment by Bio fertilizer (Azospirillum, Phosphate Solublizing Bacteria & Trichoderma)	05	20 ha.	50
	Training programme conducted on use of pheromone trap against control of stem borer of rice insect.	05	20 ha.	50
	Conducted demonstration and training on insect pest management.	05	20 ha.	50
	Conducted demonstration and training on integrated weed management	05	20 ha.	50

<b>Livestock based module</b>	Conducted demonstration of scientific goat farming with the introduction of sirohi breeds.	05	5+1 (female+male)	08
	Proper vaccination schedule for goat raring	05	5+1 (female+male)	08

## 2. Farmer-Scientist Interface

### 2.1 Farmers Training

Sl. No.	Training name	Subject	Date	Place	No. of farmers benefited
1.	Seed treatment by Bio fertilizer (Azospirillum, Phosphate Solublizing Bacteria & Trichoderma)	Crop+NRM module	26/06/2020	Sonsaytola	48
2.	Training on cultivation practices of pigeon pea on rice bund condition	Crop+NRM module	09/07/2020	Bhadsena	49
3.	Training on use of pheromone trap for insect control	Crop+NRM module	22/07/2020	Kodu tola	47
4.	Training on safe handling of weedicide	Crop+NRM module	04/08/2020	Kodu tola	48
5.	Training on control measure for insect and disease control of paddy cultivation	Crop+NRM module	29/09/2020	Sonsaytola	46
6.	Training on planning & Implementation of Horticulture aspects	Horticulture module	01/10/2020	Sonsaytola	47
7.	Training on information about insect pest management of storage grain	Crop+NRM module	27/10/2020	Sonsaytola	48
8.	Training on layout plan for drip irrigation system	Horticulture module	06/02/2021	Sonsaytola	47
9.	Training on Seed/seedling treatment by Bio fertilizer	Horticulture module	19/02/2021	Kodutola	42

	(Azospirillum, Phosphate Solublizing Bacteria & Trichoderma)				
<b>10.</b>	Training on fertigation schedule of vegetable crops	Horticulture module	22/02/2021	Mangatola	44
<b>11.</b>	Training on importance and how to operate drip system and mulching	Horticulture module	27/02/2021	Kodutola	47
<b>12.</b>	Training on control of fruit fly in cucurbitaceous crop by use of fruit flies lures and fruit fly catcher	Horticulture module	05/03/2021	Mangatola	43
<b>13.</b>	Training on insect light trap	Horticulture module	08/03/2021	Sonsaytola	45
<b>14.</b>	Training on safe handling and timely application of insecticides.	Horticulture module	19/03/2021	Mangatola	42
<b>15.</b>	Training on stacking in vegetable crops	Horticulture module	24/03/2021	Sonsaytola	46
<b>16.</b>	Training on harvesting and package of horticulture crop	Horticulture module	02/04/2021	Sonsaytola	43

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Seed treatment by Bio fertilizer (Azospirillum, Phosphate Solublizing Bacteria & Trichoderma)



Training on cultivation pactices of pigeon pea on rice bund condition



Training on use of pheromone trap for insect control

Training on safe handling of weedicide





<p>Training on layout plan for drip irrigation system</p>	<p>Training on planning &amp; Implementation of Horticulture aspects</p>
	
<p>Training on importance and operational management of drip system and mulching</p>	<p>Training on control of fruit fly in cucurbitaceous crop by use of fruit flies lures and fruit fly catcher</p>
	
<p>Training on insect light trap</p>	<p>Training on safe handling and timely application of insecticides.</p>
	
<p>Training on stacking in vegetable crops</p>	

## 2.2 Scientist Training

Sl. No.	Training name	Subject/Dept.	Date	Place	No. of farmers benefited
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1.	One day demonstration cum training programme on gum production technique	Forestry & Agril. Engineering	05.03.2021	Sonsaytola	45
2.	One day demonstration cum training programme on gum production technique	Forestry & Agril. Engineering	18.03.2021	Kodutola	42

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One day demonstration cum training programme on gum production technique at Sonsaytola	One day demonstration cum training programme on gum production technique at Kodutola





### 2.3 Demonstration

Sl. No.	Demonstration name	Subject/module	Date/season	Place	No. of farmers benefited
1.	Demonstration on zinco rice (bio-fortified) variety at farmers field	Crop based	Kharif	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha	13
2.	Demonstration on cultivation in rainfed shallow land with paddy variety (MTU-1010)	Crop based	Kharif	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha	37
3.	Demonstration on cultivation practices of pigeon pea on rice	Crop based	Kharif	Sonsaytola, Mangatola, Kodutola, Bhadsena	50

	bund condition			Semharbandha	
4.	Demonstration on safe handling of weedicide	Crop + NRM based	Kharif	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha	50
5.	Demonstration on seed/ seedling treatment with biofertilizers like (Azospirillum, Phosphate Solublizing Bacteria & Trichoderma).	Crop + NRM based	Kharif	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha	50
6.	Demonstration on use of pheromone trap	Crop+ NRM based	Kharif	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha	50
7.	Demonstration on drip system installation of selected farmers for horticulture cultivation	Horticulture based	Rabi	Sonsaytola, Mangatola, Kodutola, Bhadsena	08
8.	Demonstration on mulching of selected farmers for horticulture cultivation	Horticulture based	Rabi	Sonsaytola, Mangatola, Kodutola, Bhadsena	08
9.	Demonstration on nursery for horticulture crop	Horticulture based	Rabi	Sonsaytola, Mangatola, Kodutola, Bhadsena	08
10.	Demonstration on stacking in vegetable crops	Horticulture based	Rabi	Sonsaytola, Mangatola, Kodutola, Bhadsena	08
11.	Demonstration on light trap for insect control in horticulture crop	Horticulture based	Rabi	Sonsaytola, Mangatola, Kodutola, Bhadsena	08
12.	Demonstration on control of fruit fly in cucurbitaceous crop by use of fruit flies lures and fruit fly catcher	Horticulture based	Rabi	Sonsaytola, Mangatola, Kodutola, Bhadsena	08
13.	Demonstration on safe handling and timely	Horticulture based	Rabi	Sonsaytola, Mangatola,	08

	application of insecticides.			Kodutola, Bhadsena	
14.	Demonstration on scientific goat raring (sirohi breed)	Livestock module	-	Sonsaytola, Mangatola, Kodutola, Bhadsena Semharbandha	08

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<p>Demonstration on zinco rice (bio- fortified) variety at farmers field</p>	<p>Demonstination on cultivation in rainfed shallow land with paddy variety (MTU-1010)</p>
	
<p>Demonstration on cultivation practices of pigeon pea on rice bund condition</p>	



Demonstration on safe handling of weedicide



Demonstration on seed/ seedling treatment with biofertilizers like (Azospirillum, Phosphate Solublizing Bacteria & Trichoderma).



Demonstration on use of pheromone trap



Demonstration on drip system installation of selected farmers for horticulture cultivation



Demonstration on mulching of selected farmers for horticulture cultivation



Demonstration on nursery for horticulture crop





Demonstration on stacking in vegetable crops



Demonstration on light trap for insect control in horticulture crop



Demonstration on control of fruit fly in cucurbitaceous crop by use of fruit flies lures and fruit fly catcher

	
<p>Demonstration on safe handling and timely application of insecticides.</p>	<p>Demonstration on scientific goat rearing (sirohi breed)</p>


## 2.4 Other Activities

Sl. No.	Training name	Subject	Date	Place	No. of farmers benefited
1.	Diagnostic and scientist visit of Dignitaries	Insect and disease management in vegetable crops	06.11.2020	Sonsaytola	67

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<p align="center"><b>Diagnostic and scientist visit of Dignitaries</b></p>	

## 2.5 Media Coverage

Sl. No.	News topic	Place	Newspaper name	Date	Photograph
1.	Kisano ko aadhunik kheti se jod rha krishi vigyan Kendra rajnandgaon (किसानों को आधुनिक खेती से जोड़ रहा कृषि विज्ञान केंद्र राजनांदगांव)	Rajnand gaon	Krisakhit (web news )	01.07.2020	
2.	Kisano ko aadhunik kheti se jod rha krishi vigyan Kendra किसानों को आधुनिक खेती से जोड़ रहा कृषि विज्ञान केंद्र	Rajnand gaon /uparwah	Patrika	02.07.2020	
3.	Panch gaon ke kisano ko batai unnat kheti kee takniki 5 गांव के किसानों को बताई उन्नत खेती की तकनीकी	Rajnand gaon /uparwah	Dainik bhaskar	04.07.2020	
4.	Kisano ko diya tanachhedak niyantaran ka prashikshan किसानों को दिया तनाछेदक नियंत्रण का प्रशिक्षण	Rajnand gaon /uparwah	Dainik bhaskar	27.07.2020	



5.	<p>Jhulsa rog va algae se paudho ko surakshit rakhne kisano ko diye sujhaao</p> <p><b>झुलसा रोग व एलगी से पौधों को सुरक्षित रखने किसानों को दिए सुझाव</b></p>	Rajnand gaon /uparwah	Dainik bhaskar	14.08.2020	
6.	<p>Dhan me gangai aur tana chhedak ka chhaya prakop</p> <p><b>धान ने गंगई और तनाछेदक का छाया प्रकोप</b></p>	Rajnand gaon /uparwah	Patrika news	20.08.2020	
7.	<p>Kisan ho jaye satark, dhan me gangai aur tana chhedak ka prakop kisanan ho जाए सतर्क धान में गंगई और तना छेदक का प्रकोप</p>	Rajnand gaon	X-reporter (web news)	19.08.2020	
8.	<p>Sankraman se bachane ke sath shareer me pratirodhak kshamta badata hai zinc</p> <p><b>संक्रमण से बचाने के साथ शरीर में प्रतिरोधक क्षमता बढ़ाता है जिंक</b></p>	Rajnand gaon /uparwah	Dainik bhaskar	31.10.2020	

9.	Kisano ko dee drip se sinchai kee jankari udyaniki fasalo ke liye banai karyayojna <b>किसानों को दी ड्रिप से सिंचाई की जानकारी उद्यानिकी फसलों के लिए बनाई कार्ययोजना</b>	Rajnand gaon /uparwah	Dainik bhaskar	10.11.2020	
10.	Sirohi bakri ka vitaran va prashikshan <b>सिरोही बकरी का वितरण व प्रशिक्षण</b>	Rajnand gaon /uparwah	Patrika news	04.03.2021	
11.	Sirohi bakri ka vitran kar rakhrakhao ka diya prashikshan <b>सिरोही बकरी का वितरण कर रखरखाव का दिया प्रशिक्षण</b>	Rajnand gaon /uparwah	Dainik bhaskar	05.03.2021	

### 3. Extension activities

Sr. no.	Name of Extension activities	No. of activity	No. of villages covered	No. of farmers benefited
1.	Result Demonstration	03	05	50

2.	Method Demonstration	<b>11</b>	<b>05</b>	<b>50</b>
3.	Farmers Meetings/ training & Gosthi	<b>16</b>	<b>05</b>	<b>779</b>
4.	Group Discussion	-	-	-
5.	Farmers Scientist Interface	<b>02</b>	<b>05</b>	<b>82</b>
6.	Farmers Exposure Visit Cum Educational Tour	<b>01</b>	<b>05</b>	<b>28</b>
7.	Field Day	<b>02</b>	<b>05</b>	<b>120</b>
8.	Awareness Programme	<b>04</b>	<b>05</b>	<b>250</b>
9.	Online Training	-	-	-
10.	Any others	-	-	-
<b>Total</b>				

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Result Demonstration:





Method Demonstration:





Farmers Meetings/ training & Gosthi:





**Farmers Scientist Interface :**



**Farmers Exposure Visit Cum Educational Tour:**






**Field Day:**



**To celebration of field day at Sonsaytola**

**Awareness Programme:**

	
<p align="center"><b>Celebration of independence day at bhadsena</b></p>	<p align="center"><b>Planting material distribution at Sonsaytola under the DBT on World Environmental day</b></p>

#### 4. Technology Assemblage, Application and Feedback

##### A. Crop based module

##### i) Description of technology:

1. Name of technology	Popularization of improved rice variety such as biofortified variety zinco rice MS (high zinc content 26-28 ppm) and MTU-1010 variety for cultivation in rainfed shallow lands.
1. Farming situation	Irrigated, Rainfed
3. Problem	Poor nutrinal level, Gall midge, Stem borer, brown plant hopper and panicle mite insects, BLB, Blast, False smut diseases.
4. Potential solution	Disease and insect resistance and Nutri-rich (biofortified)
5. Nature of intervention	Scientific intervation
6. Source of technology	IGKV, Raipur
7. Expected output	
8. Area (ha)	20 ha.
9. No. of farm families	50
10. Critical input	Insecticide for different disease and insects.
11. Crop and variety	Paddy (Zinco rice MS), Paddy (MTU-1010)
12. Cost of each intervention	

##### ii) Performance Indicators



A.	Technical Observation	Farmer's practice	Intervention
i.	<b>Yield (q/ha)</b>	25 q/ha.	Zinco rice MS (35 q/ha.) MTU-1010 (45 q/ha.)
a.	<b>Grain (q/ha)</b>	16.75 q/ha	Zinco rice MS 23.45q/ha MTU-1010 30.15 q/ha
b.	<b>Straw (q/ha)</b>	8.25 q/ha	Zinco rice MS 11.55 q/ha MTU-1010 14.85 q/ha
ii.	Total water use ( $m^3 ha^{-1}$ water)/Water productivity (kg grain $m^{-3}$ )/Water use efficiency (q grain/ha/cm) <b>*In case of Ridge and Furrow/BBF/Laser land leveling/Zero tillage</b>	-	-
<b>B.</b>	<b>Economic indicators</b>		
i.	Cost of cultivation (Rs. /ha)	28250	40190
ii.	Net income (Rs. /ha)	34250	72310
iii.	B:C ratio	1.21	1.79
<b>C.</b>	<b>Farmer's reaction</b>		

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Input distribution to selected farmers of DBT's Biotech- KISAN Hub, Rajnandgaon under NIBSM, Raipur



**Seed and Seedling treatment with Bio-fertilizers (PSB Culture , Azospirillum and Trichoderma)**



**Nursery stage of Paddy (Zinco rice MS variety)**



**Transplanting and line sowing of paddy to farmers field**



**Application of herbicide spray to farmers field**



**Demonstration Field of Paddy ( Zinco rice MS and MTU-1010) at farmers field**



**Demonstration field of Rice (milking stage ) under DBT's Biotech KISAN hub, Rajnandgaon**



**Demonstration field of paddy (MTU-1010)**



**Demonstration field of paddy (Zinco rice MS Variety)**



**Pigeon pea cultivation on rice bund condition at farmers field**



**Demonstration on pheromone trap at farmers field for Insect Control**

**Scientist and diagnostic visit photos:**



**Identificaton of stem borer in rice field**



**Algae problem at farmers field**



**Gall midge attack in rice field**



**Gall midge attack in rice field**



**Celebration of field day**

**Dignitaries Visit:**



**Field visit of farmer bishahoo das sahu at sonsaytola under DBT's Biotech KISAN hub project**



**Krishak Sangoshthi**



**Distribution of Sprayer and arhar seed (rajiv lochan) by Dr. S.C. Mukharjee (DES, IGKV Raipur)**

## **B. Horticulture based module**

### **i) Description of technology:**

1. Name of technology	Vegetable cultivation with improved varieties, drip irrigation system with mulching
2. Farming situation	Upland and badi condition
3. Problem	They are mainly going vegetable (small scale) in the badi condition, shoot and foot borer in tomato, early and late blight of tomato, cucumber mosaic virus.
4. Potential solution	Shift the small scale vegetable cultivation to commercial

	vegetable grower. Selection of improved varieties.
5. Nature of intervention	Scientific
6. Source of technology	ICAR-IIHR, Bangalore, IGKV Raipur, TNAU, Tamilnadu, IISR-Pragati, Calicut Kerala
7. Expected output	Tomato (Arka Rakshak)- 156.25q/ha., Cucumber (Krish) – 298.0q/ha.
8. Plot size/area (ha)	3.23ha.
9. No. of farm families	08
10. Critical input	Problem based improved vegetable varieties, fruit fly catcher hole making machine for mulch, drip irrigation system, plastic mulching, poly wire for staking, insect proof net house
11. Crop and variety	Tomato (Arka rakshak), Cucumber (Krish), Moringa (PKM-1)
12. Cost of each intervention	-

## ii) Performance indicators

a.	Technical Observation	Farmer's practice	Intervention
	<b>Yield (q/ha)</b>	Tomato – 74.0q/ha, Cucumber- 102.0q/ha	Tomato (Arka Rakshak)- 156.25q/ha, Cucumber (Krish) 298.0 q/ha.
<b>b.</b>	<b>Economic indicators</b>		
i.	Cost of cultivation (Rs. /ha)	Tomato - Rs.60350 Cucumber – Rs. 62170	Tomato - Rs.62250 Cucumber–Rs. 64355
ii.	Net income (Rs. /ha)	Tomato - Rs.1,11,000 (15rs/kg) Cucumber – Rs. 183600 (18rs/kg)	Tomato - Rs.2,34,375 (15rs/kg) Cucumber–Rs.5,36,400 (18rs/kg)
iii.	B:C ratio	Tomato - 1.83 Cucumber – 2.95	Tomato – 3.76 Cucumber – 8.33
<b>c.</b>	<b>Farmer's reaction</b>		

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**Nursery of tomato (Arka Rakshak F<sub>1</sub>)**



**Distribution of cauliflower seedling (CFL 1522)**



**Distribution of moringa seed (var. PKM-1) under horticulture based module**

**Distribution of rope wire for staking of horticulture crop**





**Distribution of drip irrigation system**



**Measurement for drip irrigation system**



**Drip installation for horticulture crop cultivation**



**Mulching for horticulture crop cultivation**





**Installation of insect proof net house completed at farmers field for high tech cultivation of vegetable**





**Release bulletin and folders inaugurated by Dr. S.C. Mukharjee (DES, IGKV Raipur) under NIBSM project**

### C. NRM based module

#### i) Description of technology

1. Name of technology	Use of Biofertilizer like <i>Azospirillum</i> , PSB and <i>Trichoderma</i>
2. Farming situation	Irrigated, Rain-fed
3. Problem	Gall midge, Stem borer, brown plant hopper and panicle mite insects & BLB, Blast, False smut diseases.
4. Potential solution	Disease and insect resistance and Nutri-rich (Bio fortified)
5. Nature of intervention	Scientific intervention
6. Source of technology	IGKV, Raipur
7. Expected output	
8. Area (ha)	20 ha.
9. No. of farm families	50
10. Critical input	Use of different Bio-fertilizers for seed and seedling treatment
11. Crop and Variety	Paddy (Zinco rice MS), Paddy (MTU-1010)
12. Cost of each intervention	

#### ii) Performance indicators

A.	Technical Observation	Farmer's practice	Intervention
i.	Yield (q/ha)	25 q/ha.	Zinco rice MS (35 q/ha.) MTU-1010 (45 q/ha.)

a	<b>Grain (q/ha)</b>	16.75 q/ha	Zinco rice MS 23.45q/ha MTU-1010 30.15 q/ha
b	<b>Straw (q/ha)</b>	8.25 q/ha	Zinco rice MS 11.55 q/ha MTU-1010 14.85 q/ha
ii.	Total water use ( $m^3ha^{-1}$ water)/Water productivity (kg grain $m^{-3}$ )/Water use efficiency (q grain/ha/cm) <b>*In case of Ridge and Furrow/BBF/Laser land leveling/Zero tillage</b>		
<b>B.</b>	<b>Economic indicators</b>		
i.	Cost of cultivation (Rs. /ha)	28250	40190
ii.	Net income (Rs. /ha)	34250	72310
iii.	B:C ratio	1.21	1.79
C.	Farmer's reaction		

**Good quality Photograph with caption in JPG**





Seed and Seedling treatment with Bio-fertilizers (PSB Culture , Azospirillum and Trichoderma)



Use of pheromone trap for insect control of NRM based module under NIBSM project

## D. Livestock based module

Name of animal/bird:

### i) Description of technology

1. Name of technology	Demonstration of scientific goat rearing (Sirohi)
2. Farming situation	-
3. Problem	Poor knowledge of livestock rearing and high investment of cattle rearing
4. Potential solution	To overcome the investment cost through goat rearing and fulfill the nutritional security of protein and other nutrients through meat and goat milk.
5. Nature of intervention	Scientific
6. Source of technology	MP State Livestock and Poultry Development Corporation, Kiratpur , Itarsi, Madhya Pradesh
7. Expected output	-
8. No. of animals/birds	5+1 (female+male)
9. No. of farm families	08
10. Critical input	Goat vaccine, medicine and goat breed (sirohi)
11. Name of breed/species	Sirohi
12. Cost of each intervention	

### ii) Technical indicators

a.	Technical Observation	Farmer's practice	Intervention
i	Average body weight (kg)	Male 35 kg. Female 15 kg.	Sirohi male 42 kg. Sirohi Female 23 kg.
ii	No. of fingerlings/ Average egg production /month/ Average milk yield/day	250 ml	550 ml
<b>b.</b>	<b>Economic indicators</b>		
i.	Cost of cultivation (Rs. /unit)	31260	52148
ii.	Net income (Rs. /unit)	15000	33000
iii.	B:C ratio	0.47	0.63
c.	Farmer's reaction		

Good quality Photograph with caption in JPG

### Different activities of goat rearing (Sirohi breed)



Selection of site for goat rearing



Distribution and one day training programme of Does and bucks (sirohi breed)



Vaccination of does and bucks (Sirohi breed)





**New boarn Goat kid**



**Feeding (charai) of goat**



**Proper management of goat raring**



**New boarn kids of Goat**



**Proper management of goat rearing**



**Goat shed with farmer**

**Feeding the goat**

**Animal Health camp**

Particulars	No. of villages covered	No. of activities	No. of farmers covered	No. of animals covered
1	5	5	08	51

**Good quality Photograph with caption in JPG**





**E. Farmer's feedback/reaction:**

1. Awareness programme conducted for organic farming.
2. Selection of crops and varieties for specific area wise problem.
3. Conducted training programmes for increase the knowledge and better farm practices
4. Need of awareness of Farm Mechanization.
5. To create market linkage and connect with e- marketing.
6. To select improved disease and insect resistant varieties for demonstration.

**Good quality Photograph with caption in JPG**


**3. Partnership and institution Building:**

Sr. No	Technologies	Source Institution	Particulars
1.	Improved variety	IGKV, Raipur	Paddy (var. Zinco rice MS) Paddy (var. MTU-1010)
2.	Improved variety	IIHR, Bangalore	Tomato (Var. Arka Rakshak F <sub>1</sub> )
3.	Improved variety	TNAU, Tamilnadu	Moringa (Var. PKM-1)
4.	Improved variety	ICAR- IISR, Calicut, Kerala	Turmeric (Var. IISR-Pragati)

**4. Content Mobilization: 1. Success story Crop and NRM based module**

**Success Stories under DBT Biotech-KISAN Project**

DBT's Biotech- KISAN Hub project a boon for tribal farmers of Ambagarh chowki Rajnadgaon. This project run under five villages of Ambagarh Chowki Block, under this project total 50

(48+2) male and female farmers are selected as beneficiaries. Ambagarh is a tribal block and in this area most of the area is covered by forest and here main work of livelihood is farming and forest material collection. They are not much known about scientific technologies, they adopt traditional methods like broadcasting method of sowing, no application of weedicide and insecticides, unavailability of agriculture machines (seed drill, power weeder) are measure problems for low production. But after introduction of this project farmers are aware about improved technologies such as DSR (Direct seeded rice by seed drill), line sowing/ transplanting. Under this project seed drill has also provided to the farmers for their awareness.

### **Outline of the Success Story**

- 1) **Title of the Success Story:** Story of successful adoption of scientific cultivation practices of bio fortified Rice of tribal farmers at Rajnandgaon district
- 2) **Location and Selection of area Village:** Mangatola, Kodutola, Semharbandha, Bhadsena, Sonsaytola Block Ambagarh Chowki of Rajnandgaon district.
- 3) **Number of Farm families: 50**
- 4) **Objectives:**
  - Increased the production level through scientific cultivation practices.
  - Uplifted the socio economic status of farmers.
  - Enhanced the nutritional status of farmer families through introduction of bio-fortified Rice varieties.
  - Increased the farm produce and income for better living standard.
  - Improved the skill of different agricultural practices through implementation a project.
  - Innervations of different scientific technology such as line sowing, transplanting of rice, seed / seedling treatment with bio fertilizers, timely application of bio fertilizer, fertilizers, insecticides and weedicide.
  - Gave the knowledge about Insect pest management and grain storage management.

## 5) Interventions:

### **Crop+ NRM (Natural Resource Management) :**

- We provided problem specific varieties such as drought tolerant, nutri- rich rice variety, insect and disease resistant varieties of rice to the farmers.
- Organized demonstration and training on (DSR) method of sowing of Rice crop by seed drill.
- Distributed bio fertilizers and trained the methods for Seed treatment/ seedling treatment with Bio fertilizers (Azospirillum, Phosphate Solublizing Bacteria & Trichoderma).
- Conducted training and demonstration to the farmers on cultivation practices of pigeon pea (Var. Rajiv Lochan) on rice bund condition.
- Conducted training and demonstration to the farmer's field on use of pheromone trap for insect control.
- Conducted training on safe handling and timely application of weedicide.
- Conducted Demonstration and training on insect pest management.

### **Capacity building measures**

#### **Detail of training programme under NIBSM Project:**

<b>S/No.</b>	<b>Detail of training</b>	<b>Place</b>	<b>No. of participant</b>
1.	Seed treatment by Bio fertilizer (Azospirillum, Phosphate Solublizing Bacteria & Trichoderma)	Sonsaytola	48
2.	Training on cultivation practices of pigeon pea on rice bund condition	Bhadsena	49
3.	Training on use of pheromone trap for insect control	Kodutola	47
4.	Training on safe handling of weedicide	Kodutola	48
5.	Training on control measure for insect and disease control of paddy cultivation	Sonsaytola	46
6.	Training on information about insect pest management of storage grain	Sonsaytola	48

## 6) Details of modules selected:

### A. Crop Based Module:

- **Intervention:** Scientific technical intervention in a module.
  - Nutri-rich (Bio fortified) rice variety (High zinc content more than 26-28 PPM) good for child development and pregnant women and also problem specific varieties such as Maheshwari (Disease and insect resistant) and DRR dhan-42 (Drought resistant) distributed.
  - Conducted Demonstration and training programme for **Seed treatment by Bio fertilizer** (Azospirillum, Phosphate Solubilizing Bacteria & Trichoderma)
  - Conducted training on cultivation practices of pigeon pea (Rajiv Lochan) on rice bund condition.
  - Organized training programme on safe handling and spraying of weedicide Pretilachlor 50 EC 500 ml/acre pre-emergence herbicide for transplanted rice and for DSR Post Emergent, Bispyribac Sodium 10% SC.
  - Training programme conducted on use of pheromone trap against control of stem borer of rice insect.
- **Rational of intervention:** Given the selected location and weather, scientific rational of intervention.
  - ✓ Due to poor nutritional level of that area we intervened the Nutri-rich (Bio-fortified) rice variety of high zinc content (more than 26-28 PPM) good for child development and pregnant women and also pigeon pea plantation on fellow bund for utilization of bund land and also add the protein level in nutritional level of farmers.
  - ✓ Treated Seed and seedling with bio fertilizer Azospyrillum, Trichoderma and PSB for get more yields.
  - ✓ Most of the farmers were used broadcasting method of sowing for rice cultivation but after given demonstration and training by KVK scientist for line sowing, transplanting and direct seeded rice they have start to cultivate rice by transplanting and DSR method through seed drill and got more profit as compare to the past practice.

- ✓ In general, farmers were not applied any weedicide and insecticide therefore heavy incidence of weeds and insects specially Stem borer and panicle mites occurred and result was poor yield and get less production, to solve these major problems we provided to the farmers pheromone trap, lures and weedicide, Pretilachlor 50 EC 500 ml/acre pre-emergence herbicide for transplanted rice and for DSR Post Emergent, Bispyribac Sodium 10% SC.

**Outcome:** Explain the outcome with figures.

Sl. No	Crops/ Unit	No. of farmers	Area (ha.)	Average ( yield q/ha)		Yield increase (%)
				Demonstrations plot with improved cultivar	Farmer practice with Local cultivars	
1	Paddy (Zinco rice MS)	13	5.26	35		28.57
2	Paddy (MTU-1010)	37	14.97	45	25	44.44

Earlier they got 25 qn /ha. production of rice due to adoption of traditional technologies such as use of traditional varieties, broad casting method of sowing, no application of weedicide and insecticides, but after introduction Biotech - KISAN Hub project they got more production 35-45 qn per hectare as compare to local cultivars and 28.57%, 44.44 % respectively change observed in production level of Zinco rice MS and MTU-1010.

### **Drawbacks and Lesson learnt:**

The drawback of rice during, stem borer and panicle mites insect occurrence was more and timely application of pesticides were not applied therefore few farmers got poor yield

**Trainings:** By these training programmes farmers got knowledge for improved technologies of rice cultivation such as improved varieties, methods of sowing and crop management.



Input distribution to selected farmers of DBT's Biotech- KISAN Hub, Rajnandgaon under NIBSM, Raipur





**Seed and Seedling treatment with Bio-fertilizers (PSB Culture , Azospirillum and Trichoderma)**



Fig. 1: Present status of rice (MTU-1010) field of Ishwar sahu at mangatola



Fig. 2: Present status of rice demonstration field of dhal singh nishad at Kodutola



Fig 3: Present status of rice field (MTU-1010) Bharat mandavi at Bhadsena



Fig. 4: present status of rice field (MTU-1010) of Madhav Sinha at Semharbandha



Fig.5: Present status of rice field (Zinco rice)



Fig 6: Present status of rice field (Zinco rice) Hemsingh at Mangatola



Fig. 7: Present status of rice field (MTU- 1010) of Anuk lal Sahu at Semharbandha



Fig. 8: Celebration of field day programme with harvesting of MTU-1010



Fig. 9: Harvesting of MTU-1010

- 7) **Impact of DBT Biotech-KISAN Hub:** Assessment of the impact of technology demonstrated on the farmer's field is crucial to understand the outcome of the programme. Through scientific interventions of Economic and Social impact. Provide with figures and photographs.

**Farmer Name:** Omkar Margaye, **Vill-** Sonsaytola, **Block-** Ambagarh Chowki



<b>Before</b>	<b>After</b>
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**Impact of scientific interventions:**

SN.	Year	No. of adopted farmers	No. of farmers adopted technology			% change in transplanting methods of rice	Remark
			Transplanting	Direct Seeded Rice through seed drill	Broad casting		
1	At the time of project start	50	9	0	41	-	After the start of this project, farmers were adopted line sowing and transplanting and getting more benefits in comparison with year 2019-20. Maximum farmers were adopted the traditional method of sowing, but after the implementation of this project, the farmers started line sowing and transplanting method. In last two years of experiment 66.66 percent and 70.37 percent respectively in first and second year change observed in the way of sowing by the farmers.
2	2020-21	50	27	0	23	66.66	
3	2021-22	50	46	2	2	70.37	



Transplanting and line sowing of paddy to farmers field



Demonstation Field of Paddy ( Zinco rice MS and MTU-1010) at farmers field

8) **Way forward:** In bullets.

- To select disease and insect (stem borer) resistant varieties for demonstration.
- To promote the farmers for line sowing and transplanting for getting more yield.
- To enhance the knowledge of scientific technique through awareness programme, live demonstration and training.
- To prepare the SHGs for rice value addition with Mini rice mill such as Zinco rice, or other bio fortified varieties of rice.
- To create market linkage and connect with e- marketing.

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## 2. Success story of horticulture based module

### **Success Stories under DBT Biotech-KISAN Project**

DBT's Biotech- KISAN Hub project is a boon for tribal farmers of Ambagarh chowki Rajnandgaon. This project run under five villages of Ambagard Chowki Block, under this project total 50 (48+2) male and female farmers are selected as beneficiaries. Ambagarh is a tribal block and in this area most of the area is covered by forest and here main work of livelihood is farming and forest material collection. They were not much knowledge about scientific technologies they only concentrated on traditional methods like badies cultivation for vegetable production, no application of weedicide and insecticides, unavailability of agriculture machines (power weeder) were measure problems for low production. But after introduction of this project farmer aware about improved technologies such as Drip irrigation system with mulching. Through this project drip system (08 acre) with mulching and hole making machine, fruit fly catcher, light trap has also provided to farmers. Now farmers have started commercialized vegetable production.

#### **Outline of the Success Story**

- 1) **Title of the Success Story:** Drip irrigation system and mulching along with improved varieties of vegetables are the major source for more income of tribal farmers.
- 2) **Location and Selection of area Village:** Mangatola, Kodutola, Semharbandha, Bhadsena, Sonsaytola, Block Ambagarh Chowki, Distt. Rajnandgaon (C.G.)
- 3) **Number of Farm families: 08**

#### 4) Objectives:

- Increased the production level through scientific cultivation practices.
- Uplift the socio economic status of farmers.
- Enhanced the nutritional status of farmer families through introduction of vegetable cultivation.
- Increased the farm produce and income for better living standard.
- Improved the skill of different agricultural practices through implementation of the project.
- Innervations of different scientific technology such as drip irrigation and mulching.
- Gave the knowledge about Insect pest management.

#### 5) Interventions:

##### Horticultural modules :

- Provided drip irrigation system with ventury and mulching film 30 micron to establish the high tech vegetable production unit.
- Provided and demonstrated the improved vegetables varieties, such as Drumstick (var PKM-1), Tomato (var. Arka rakshak F<sub>1</sub>), Cucumber (var. Krish).
- Conducted Training and demonstration on importance, uses and management of drip system and mulching.
- Conducted training and demonstration on control of fruit fly on cucurbitaceous crop by use of fruit flies lures and fruit fly catcher.
- Organized training programme and demonstration on insect light trap.
- Conducted training and demonstration on stacking in vegetable crops.
- Conducted training and demonstration on fertigation schedule of vegetable crops.
- Organized training programme on safe handling and timely application of insecticides.
- Organized Training on identification and control of insect pest and diseases and its control.

##### Capacity building measures

##### **Detail of training programme under NIBSM Project**

S/No.	Detail of training	Place	No. of Participants
1.	Training on planning & Implementation of Horticulture aspects	Sonsaytola	47
2.	Training on layout plan for drip irrigation system	Sonsaytola	47
3.	Training on Seed/ seedling treatment by Bio fertilizer (Azospirillum, Phosphate	Kodutola	42

	Solublizing Bacteria & Trichoderma)		
4.	Training on fertigation schedule of vegetable crops	Mangatola	44
5.	Training on importance and how to operate drip system and mulching	Kodutola	47
6.	Training on control of fruit fly on cucurbitaceous crop by use of fruit flies lures and fruit fly catcher	Mangatola	43
7.	Training on use of insect light trap in vegetable crops.	Sonsaytola	45
8.	Training on stacking in vegetable crops	Sonsaytola	46
9.	Training on safe handling and timely application of insecticides.	Mangatola	42

#### 6) Details of modules selected: **Horticultural Module:**

- **Intervention:** Scientific technical intervention in a module.
  - Distributed Arka rakshak –Tomato variety triple disease resistant F1 hybrid good response in drip condition.
  - Organized training and demonstration programme for Seed/ seedling treatment with Bio fertilizer (Azospirillum, Phosphate Solublizing Bacteria & Trichoderma)
  - Conducted training and demonstration on fertigation schedule of vegetable crops.
  - Provided training and demonstration on importance, uses and management of drip system and mulching.
  - Conducted training and demonstration on control of fruit fly on cucurbitaceous crop by use of fruit flies lures and fruit fly catcher.
  - Explained and gave demonstration on insect light trap.
  - Organized demonstration on stacking in vegetable crops.
  - Explained and gave demonstration on fertigation schedule of vegetable crops.
- **Rational of intervention:** Given the selected location and weather, scientific rational of intervention.
- ✓ They grow vegetables in badies or in field as traditional method and got low profit due to poor knowledge about high tech vegetable cultivation therefore we provided drip irrigation system with mulching to the farmers.



- ✓ Due to more weeds infestation occurred in vegetable cultivation the production reduced and cost of cultivation increased because of more labour required for weeding, to solving this problem we demonstrated silver plastic mulching 30 micron for controlling insects and weeds problem and reduced cost of cultivation.
- ✓ Explained the uses of bio fertilizers, Azospyrillum, Trichoderma and PSB for Seed and seedling treatment of vegetables to get more yields.
- ✓ Most of the farmers did not use any kind of stakes, to support the vineyard vegetables, so production and quality of vegetables becomes poor. To overcome this hurdle, we demonstrated the stakes with plastic wire and bamboo sticks to produce good quality vegetables.

**Outcome:** Explain the outcome with figures.

Sl. No	Crops/ Unit	Achievement		Average ( yield q/ha)		Yield increase (%)
		Number	Area (in ha.)	Demonstrations units	Local (Existing practice)	
1.	Tomato	08	1.6	156.25	74.0	52.64
2.	Cucumber	08	1.6	298.0	102.0	65.77

Before they got 74 q /ha, 102.0 qn/ha production of tomato and cucumber respectively with local varieties but after installation of drip system and improved varieties Arka Rakshak and krish they got 156.25 qn/ha, 298.0qn/ha production of tomato and cucumber and in case of tomato 52.64% and for cucumber 65.77% change in production level observed.

**Drawbacks and Lesson learnt:**

- Un-availability of large market, district market 16 Km. away from adopted village therefore transportation charges is high.
- They grow in small quantity and different types of vegetables therefore they unable to send vegetables in distant market.

6) **Trainings:** Explain trainings that have been given to the farmers, how these trainings have been beneficial in enhancing their skills. Provide photographs with captions.

**Nursery of tomato (Arka Rakshak) and Moringa (PKM-1) under horticulture module:**



**Tomato (A.Rakshak) F1**



**Moringa (PKM-1)**



**Raised nursery bed of Tomato (Var. Arka Rakshak )**



Application of laying of plastic mulching at farmer field under horticulture module



Plastic mulching at farmers field



Performance of Tomato (var.Arka rakshak)



Conducted training programme at village Sonsaytola A. Chowki block



Training on application and use of fruit fly catcher and lure at farmer field of village Bhadsena



Training on application and use of light trap at farmer field, village sonsaytola

- 7) **Impact of DBT's Biotech- KISAN Hub:** Assessment of the impact of technology demonstrated on the farmer's field is crucial to understand the outcome of the programme. Through scientific interventions of Economic and Social impact. Provide with figures and photographs.

Name: Mr. Dharam Das Sahu, Vill.- Sonsaytola Block- A.Chowki



**Before**



**After**

Name: Mr. Laxman Margaye, Vill.- Kodutola Block- A. Chowki



**Before**



**After**



**Before**

**After**



**Fig. Impact of DBT Biotech-KISAN Hub at farmer Lakhan Lal Kolyare field**

**Impact of scientific interventions:**

**Vegetable cultivation with drip irrigation system with mulching**

SN.	No. of adopted farmers	Vegetable cultivation with drip irrigation system with mulching			Remark
		No. of farmers adopted technology Before project start	No. of farmers adopted after project start	% change in	
1	50	02	10	80	Before launch of this project, only two farmers were having drip system out of 50 farmers of five villages but in the year 2020-21, 10 farmers were adopted this technology and produced huge vegetable production successfully.

**8) Way forward:** In bullets.

- To select improved disease and insect resistant varieties for demonstration.
- To promote the farmers for cooperative farming of vegetables.
- To enhance the knowledge of scientific technique through awareness programme and live demonstration and training.
- To prepare the SHGs for value addition of fruits and vegetables. such as Dried tomato, tomato powder, dried mango (amchoor), dry onion.
- Create market linkage and connect with e- marketing.