

# RECENT ADVANCES IN FARMER FIRST PROGRAMME: REFLECTION FROM ICAR-ATARI KOLKATA



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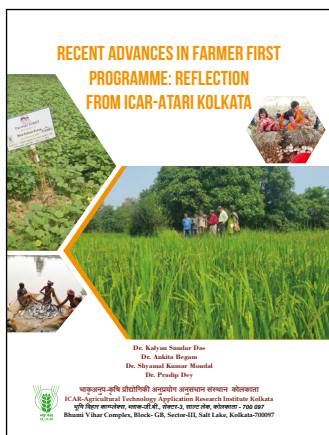
# RECENT ADVANCES IN FARMER FIRST PROGRAMME: REFLECTION FROM ICAR-ATARI KOLKATA

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This publication is an outcome of technical achievements done by four Farmer FIRST Project Centres during the year 2022-23.

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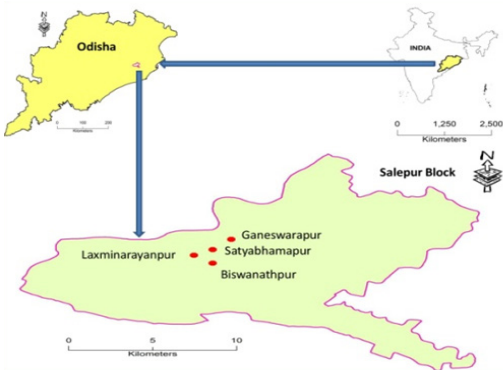
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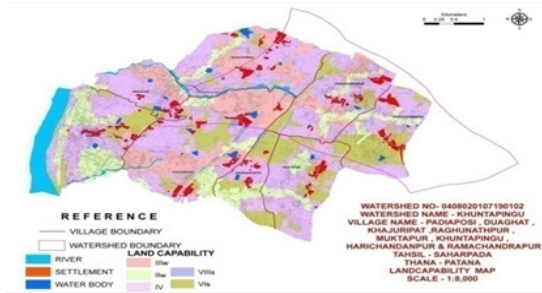
## Operational Villages



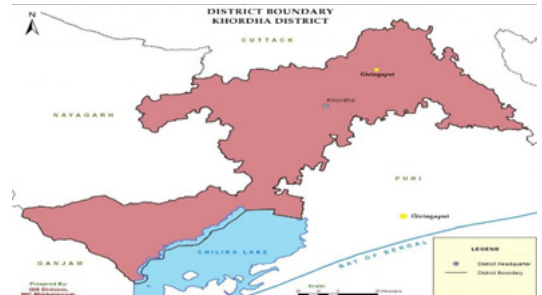
ICAR-NRRI, Cuttack



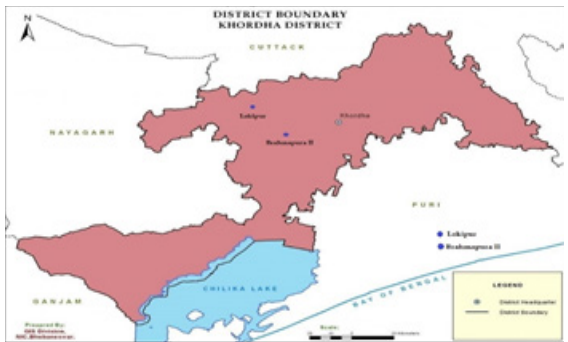
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ICAR-IIWM, Bhubaneswar



OUAT, Bhubaneswar





# PREFACE



The 'Farmer FIRST Programme' started with the objective to strengthen farmer-scientist interface, technology assemblage, application and feedback, partnership and institutional building and content mobilization in which the farmers participated in the research process with the scientists of ICAR and SAUs. It created linkages between farmers-researchers and extensionists to support farmers to conduct appropriate experiments selected by them. The knowledge and innovations of farmers were given due credit and they were

considered as partners, not as participants, in the experimentations in deriving suitable options for different production systems. The participation of multiple stakeholders was ensured for technology development, integration and adoption.

Farmer FIRST Programme (FFP) is an opportunity for the researchers, extension professionals and farmers to work together and to find out appropriate ways through assessing different solutions. New ideas of farmers were emphasized in improving their package of practices of cultivation through judicious use of natural resources. It was applied not only at household level but also at village and community level. Out of total 52 projects across the country, four projects with fund allocation of Rs. 132.08 lakh were sanctioned for this zone in the year 2017-18. However, during 2022-23, the allocation for the centres of this zone was 76.25 lakh. Accordingly, all centres conducted various activities in their adopted villages and farmers' agri-business was made sustainable. After 4-5 years from the inception of FFP, concerned institutes selected new adopted villages as per guidelines of the Council. However, at least 20-25% of their total annual activities are still being continued in the old adopted villages. It was evident from different modules implemented in this zone that there were significant changes in the cropping intensity, production and productivity, cropping sequences, mortality rate of livestock including poultry, fish production, enterprise development, capacity building of farmers and so on.

This publication reflects outcome of physical and financial achievements of four concerned centres during the year 2022-23. I must appreciate to all project leaders and their associates of four institutes for scientific, methodical and successful implementation of their projects and for taking pain in timely submission of various reports as per requirements. My sincere thanks and congratulations to the scientist(s) and staff of ICAR-ATARI, Kolkata who are engaged in the programme and put their efforts in bringing out such a nice publication to showcase the different activities conducted during the period.



Pradip Dey  
Director









# 1 INTRODUCTION

The term 'Farmer FIRST' means the farmers' Farm, Innovations, Resources, Science and Technology (FIRST). A novel initiative of the Indian Council of Agricultural Research (ICAR), the 'Farmer FIRST Programme', was focused on farmers' Farm, Innovations, Resources, Science and Technology (FIRST) where farmers played a central role in the identification of research problems, prioritization of those problems, and conduct of experiments as well as their management in field conditions. Small-scale and marginal farmers, especially women, were the main target groups. The programme came into action during 2015-16. After zone reorganization, Odisha came under the jurisdiction of ICAR-ATARI Kolkata w.e.f. the year 2017-18. Accordingly, Farmer FIRST projects pertaining to ICAR-NRRI, Cuttack; ICAR-CIFA, Bhubaneswar; ICAR-IIWM, Bhubaneswar and OUAT, Bhubaneswar came in operation under this Zone.

During the year 2022-23, a total of 771 demonstrations were conducted on crops, horticulture, livestock/ fisheries, IFS, NRM and enterprise-based modules involving total 2469 farm families. On the other hand, 19 programmes on different extension activities were also conducted which involved 1237 farmers. Two zonal review workshops (one online and one off-line) were organized by ICAR-ATARI Kolkata for four FFP institutes to review the physical and financial progress of the projects for the year 2022-23 and to finalize the action plan for the year 2023-24. Two field visits were also conducted to monitor the progress of various activities being carried out by the project institutes at their new and old adopted villages.

Considering the doubling farmers income (DFI), about 200 cases of successful farmers were collected from the concerned institutes in the prescribed proforma of ICAR and all cases were submitted to the ICAR-ATARI, Hyderabad for its publication. During the period of report, one initiative was taken to publish a coffee table book entitled 'Pioneer Farmers: Agri-sustainability through Farmer FIRST approach' from ATARI Kolkata on the success of farmers under the project for the period of 2016-17 to 2020-21.

## Objectives

The Farmer FIRST Programme aims at enhancing farmer-scientist interface for technology development and application. It will be achieved with focus on innovations, technology, feedback, multiple stakeholder's participation, multiple realities, multi method approaches, vulnerability and livelihood interventions. The specific objectives are:

- ❖ To enhance farmer-scientist interface, enrich knowledge and facilitate continued feedback;
- ❖ To identify and integrate economically viable and socially compatible technological options as adoptable models for different agro-ecological situations;





- ❖ To develop modules for farm women to address drudgery reduction, income enhancement and livelihood security;
- ❖ To study performance of technologies and perception of the farmers about agriculture as a profession in the rural settings;
- ❖ To build network of linkages of organizations around the farm households for improving access to information, technology, input and market;
- ❖ To institutionalize Farmer FIRST process.





## 2 PROJECT DETAILS

A total of four projects are in force under ICAR-ATARI Kolkata. The details about all projects are given below.

**Table 1: Details of FFP projects, budget allocation and utilization during 2022-23**

Sl. No.	Name of the project (Institute/ University)	Name of the PI/Nodal Scientist with contact details	Fund allocated during 2022-23 (Rs. in lakh)	Fund utilized during 2022-23 (Rs. in lakh)
1.	Increasing productivity and sustaining the rice-based production system through Farmer FIRST approach (ICAR- National Rice Research Institute, Cuttack)	Dr. S. K. Mishra (upto 30.08.2022); 09437566980; skmishra.icar@gmail.com/ sumanta.mishra@icar.gov. in and Dr. B. Mondal, Pr. Scientist (since 31.08.2023); 08895322975 (M); bisumondal@rediffmail.com	20.00	17.85
2.	Promoting Improved Agriculture and Allied Sector Technologies in Khordha District through Farmer FIRST Approach (ICAR- Central Institute Freshwater Aquaculture, Bhubaneswar)	Dr. H. K. De, Pr. Scientist; 09437303382; bhuthnath@gmail.com	16.75	16.63
3.	Enhancing water and livelihoods security and improving water productivity in tribal dominated paddy fallow rainfed agro eco system of Odisha (ICAR-Indian Institute of Water Management, Bhubaneswar)	Dr. D. Sethi, Scientist (Agril. Extension); 07008103447; debabrataiiwm@gmail.com	16.50	12.48
4.	Enhancing Farm Productivity & profitability with 'Farmer FIRST' focus in Khordha district of Odisha (OUAT, Bhubaneswar)	Dr. B. S. Rath, Prof. & Head (Agronomy); 09437628225; bsrath816@gmail.com/ farmersfirstouat@gmail.com	16.50	16.00
5.	ICAR-Agricultural Technology Application Research Institute (ATARI) Kolkata	Dr. K. S. Das, Pr. Scientist; 09432581103; Kalyan.Das@ icar.gov.in/ kalyanlpm@gmail.com	6.50	5.70
<b>Total</b>			<b>76.25</b>	<b>68.66</b>



## 3 SALIENT ACHIEVEMENTS

The brief physical achievements of Farmer FIRST Programme under this Zone have been presented under the following subheads.

### 3.1 Modules and farm families

Table 2: Details of modules and farm families covered during 2022-23

Name of Institute	NRM Module		Crop Module		Horticulture Module		Livestock & Poultry			IFS Model		Fishery (Composite Carp Culture)		Enterprise based Model		
	Demonstrations (No.)	No. of Farm Families	Demonstrations (No.)	No. of Farm Families	Demonstrations (No.)	No. of Farm Families	Demonstrations (No.)	No. of Farm Families	No. of Animals	Demonstrations (No.)	No. of Farm Families	Demonstrations (No.)	No. of Farm Families	No. of fish-fries	No. of prog	No. of Farmers
ICAR-CIFA, Bhubaneswar	0	0	2	36	12	105	2	16	600	4	4	4	150	120000	0	0
ICAR-IIWM, Bhubaneswar	6	54	4	45	8	540	0	0	0	5	5	0	0	0	3	163
ICAR-NRRI, Cuttack	0	0	4	98	16	295	2	200	2000	3	2	3	37	50000	1	34
OUAT, Bhubaneswar	15	15	250	250	105	105	320	265	1564	0	0	0	0	0	2	50
<b>Total</b>	<b>21</b>	<b>69</b>	<b>260</b>	<b>429</b>	<b>141</b>	<b>1045</b>	<b>324</b>	<b>481</b>	<b>4164</b>	<b>12</b>	<b>11</b>	<b>7</b>	<b>187</b>	<b>170000</b>	<b>6</b>	<b>247</b>

### 3.2 Farmer-Scientist interface

The extension activities under farmer-scientist interface of four Farmer FIRST centres of ICAR-ATARI Kolkata are presented in Table 3. Under this component, a total of 285 extension activities have been conducted by different FFP centres involving a total of 3155 farmers during the year 2022-23. Notably, 16 training programmes were conducted in which more than 900 farmers participated. Likewise, there were 11 awareness camps, 4 exposure visits, 2 animal health camps, 23 field days and 49 other extension activities which benefited 714, 99, 154, 350 and 864 farmers, respectively.





**Table 3: Extension activities under Farmer-Scientist interface**

Name of FFP centre	Training		Awareness camps		Exposure visits		Animal health camps		Field day		Others extension activities		Total	
	A	P	A	P	A	P	A	P	A	P	A	P	A	P
ICAR-CIFA, Bhubaneswar	3	90	6	480	0	0	0	0	2	50	46	750	57	1370
ICAR-IIWM, Bhubaneswar	2	153	1	72	0	0	0	0	0	0	0	0	03	225
ICAR-NRRI, Cuttack	6	431	2	112	1	39	1	104	20	200	1	84	211	970
OUAT, Bhubaneswar	5	300	2	50	3	60	1	50	1	100	2	30	14	590
<b>Total</b>	<b>16</b>	<b>974</b>	<b>11</b>	<b>714</b>	<b>4</b>	<b>99</b>	<b>2</b>	<b>154</b>	<b>23</b>	<b>350</b>	<b>49</b>	<b>864</b>	<b>285</b>	<b>3155</b>

A: No. of Activities; P: No. of Participants

During the period under report, ICAR-CIFA, Bhubaneswar conducted a total of 57 extension programmes involving 1370 participants. The centre conducted 6 awareness camp for 480 participants, one stakeholder meeting with 60 participants, forty-four field visits with 660 participants, three capacity building programmers with 90 participants and two field days with 50 participates.

Under this component, a total of three extension activities were organized by the Farmer FIRST Programme of ICAR-IIWM, Bhubaneswar benefiting 225 farmers during the period for enhancing farmer-scientist interface as presented in Table 3. Two training programmes were conducted in which 153 farmers and farmwomen participated. In addition, one awareness camp was also organized which benefitted 72 farmers.

During the year 2022-23, ICAR-NRRI, Cuttack conducted total 211 extension programs with total 970 participants. Under FFP, the institute conducted six training programmes in which 431 farmers participated. Awareness camps held twice in which 112 number of farmers got benefit. An exposure visit was conducted in which 39 farmers called on to the institute and attended various facilities. Animal health camp was organized at one village in which 104 farmers brought their animals for treatment/ vaccination. Field days-cum-crop cutting programmes (20 numbers) were organized at different villages with presence of about 200 farmers. A programme was organized to mobilize farmers for membership of Farmer Producer Organization (FPO) developed at the cluster in which 84 farmers participated.

A total of 14 extension activities under farmer-scientist interface which comprised of 590 farmers were conducted by OUAT, Bhubaneswar centre during the reporting period (Table 3). Under awareness camps, about 8 progressive farmers were trained through training on spawn production technology. Maximum farmers (300) were benefitted



from trainings followed by field day, exposure visit and awareness camp/animal health camp.

### 3.3 Technology assemblage, application and feedback

Under this component, various modules e.g. crop-based, horticulture-based, natural resources management (NRM)-based, livestock-based, enterprise-based and integrated farming systems (IFS)-based modules were considered. The module-wise progress of technology assemblage, application and feedback have been enumerated as below.

#### 3.3.1 Crop-based module

Four FFP centres under Zone-V carried out total 446 demonstrations covering a total area of 148.6 ha under this module. Table 4 reveals that ICAR-CIFA, Bhubaneswar conducted 30 demonstrations on paddy (variety 'CR-409 Pradhan') in the project area covering 4 ha area. Those demonstrations focused on crops such as paddy as part of the crop-based module. Notably, those demonstrations resulted into a remarkable increase in yield, exceeding 51.5% when compared to local checks. Additionally, higher net returns observed in demonstrations (₹10744/-) compared to the local checks (₹3353/-). It translated into a higher benefit-cost ratio (B:C ratio) of 1.21 for the demonstrations compared to 1.03 for the local checks.



ICAR-IIWM, Bhubaneswar centre carried out four demonstrations covering a total area of 0.8 ha under this module. Those demonstrations focused on two crops, namely paddy and maize (sweet corn) as part of the crop-based module (Table 4). Table further reveals that ICAR-IIWM conducted 16 demonstrations on summer paddy (varieties 'CR Dhan-310' and 'Naveen') in the project area covering an area of 3.2 ha. Its pertinent to mention here that 'CR Dhan-310' was the first high protein rice of the country released by ICAR-NRRI, Cuttack which contained about 10.3% grain protein content (GPC) as against normal rice with about 6-7% GPC. Notably, those demonstrations resulted in a remarkable increase in grain yield ('CR Dhan 310' - 69.6 q/ha, 'Naveen' - 60.7 q/ha) exceeding 38.09% and 20.43%, respectively when compared to the local check 'Mamata' (50.4 q/ha) of same duration and grown largely in the locality. Additionally, higher net returns were observed in demonstrations (Rs. 89200/ha & Rs. 71400/ha) as compared to the local check (Rs. 50800/ha). It translated into to a higher benefit-cost ratio (B:C ratio) of 1.78 and 1.42, respectively for the demonstrations compared to 1.01 for the local check.



Another demonstration was conducted on maize (sweet corn) in an area of 1.0 ha with the involvement of three SHGs involving 30 members. The yield of maize grain under demonstrations conducted by ICAR-IIWM was found to be 167.7 q/ha which was 11.94% higher than the local check. The benefit-cost ratio (B:C ratio) of the demonstrated variety was found to be 2.07 as compared to the local check with 2.05 (Table 4).

**Table 4: Performance of demonstrations of crop-based module**

Name of FFP Centre	Name of Crop	Variety	Demos (No.)	Area (ha)	Yield (q/ha)			Net return (Rs./ha)		B:C ratio	
					Demo	Check	% increase	Demo	Check	Demo	Check
ICAR- CIFA, Bhubaneswar	Paddy	CR-409 Pradhan	30	4	50.00	33.00	51.5	10744	3353	1.21	1.03
ICAR-IIWM, Bhubaneswar	Paddy	CR Dhan-310	4	0.8	69.6	50.4	38.09	89200	50800	1.78	1.01
	Paddy	Naveen	12	2.4	60.7	50.4	20.43	71400	50800	1.42	1.01
	Maize	Sugar -75	30	1.0	167.7	149.8	11.94	167750	140900	2.07	2.05
ICAR-NRRI, Cuttack	Paddy	CR Dhan 1009 sub1	270	57	56.2	43.7	28.6	73020	46770	2.6	2.0
		CR Dhan 312									
		CR Dhan 508									
		CR Dhan 507									
		Swarna sub 1									
		CR Dhan 409									
		Pooja									
CR Dhan 800											
OUAT, Bhubaneswar	Paddy	Swarna sub 1	50	50.2	45.7	26	75.7	22350	8534	1.48	1.25
		Hasant	50	33.2	48.3		85.7	26250		1.57	
<b>Total</b>			<b>446</b>	<b>148.6</b>							

The demonstrations of ICAR-NRRI, Cuttack focused on the paddy. Table 4 showed that NRRI, Cuttack centre conducted 270 demonstrations on paddy of high yielding/ tolerant varieties in the project area covering an area of 57 ha. Notably, those demonstrations resulted in a remarkable increase in yield, on an average 29% over local checks. Additionally, higher net returns were observed in demonstrations (₹73020/-) compared to the local checks (₹46770/-). Higher (2.6) benefit-cost ratio (B:C ratio) was found in demonstrated plot compared to local checks (2.0).

Before FFP intervention, the farmers were following broadcasting and low yielding local varieties like 'Nali dhusura', 'Chinamali' etc. With FFP intervention along with demonstrations on line transplanting and introducing HYVs like 'Swarna Sub 1' and Hasant with improved package of practices like INM, IPM and IWM, the production was substantially increased. The OUAT FFP centre carried out 100 demonstrations covering a total area of 83.4 ha under this module. Those demonstrations resulted substantial increase in yields, exceeding 76-86% when compared to local checks. Additionally,



higher net returns observed in demonstrations (₹22350/- to ₹26250/-) compared to the local checks (₹8534/-). That caused higher benefit-cost ratio in the tune of 1.48 to 1.57 for the demonstrated crops compared to the local checks (1.25).

### 3.3.2 Horticulture-based module

Under the horticulture-based module, demonstrations on vegetable production, fruit production, flower production and backyard nutrition kitchen garden (nutri-garden) were undertaken. The technology demonstrated by the FFP centres of ATARI Kolkata at farmers' field aimed to show its higher production potential than the existing technology/practice of the farmers. The progress of different demonstrations pertaining to this zone has been described below.

#### i) Vegetable production

ICAR-CIFA laid out 105 demonstrations on improved technologies/ practices of vegetable production at the farmers' fields covering an area of 5.7 ha. The details of demonstrations conducted on different vegetable crops are given in Table 5. The centre conducted 30 demonstrations on bitter melon (*Rushaan*), in the project area covering an area of 2 ha. Those demonstrations resulted in increase in yield to 65.00 q/ha from 50.00 q/ha earlier, exceeding 30% when compared to local checks. Additionally, higher net returns observed in demonstrations (₹138859/-) compared to the local checks (₹74187/-) which resulted higher benefit-cost ratio (B:C ratio) of 1.65 for the demonstrated fields compared to the local check fields (1.12). The centre conducted 40 demonstrations on French bean (*Arka komal*) in the project area covering an area of 1.7 ha which resulted increase yield to the tune of 100 q/ha from 80 q/ha earlier, exceeding 25% when compared to local checks. Additionally, higher net returns were observed in demonstrations (₹217070/-) compared to the local checks (₹102451/-). That increased benefit-cost ratio of 2.61 for the demonstrations than local checks (1.58). Total 35 demonstrations on photo-sensitive cauliflower (*Fujiyama*) in the project area covering an area of 2 ha which increased yield to 180 q/ha from 150 q/ha earlier, exceeding 20% when compared to local checks. Additionally, higher net return was observed in demonstrations (₹122688/-) compared to the local checks (₹141143/-). Higher benefit-cost ratio (1.94) was recorded for the demonstrations than local checks (1.31).







Table 5 reveals that ICAR-IIWM, Bhubaneswar conducted 115 demonstrations on 5 different vegetables covering more than 16.2 ha area. The details of demonstrations conducted on different vegetable crops are given below in Table 5. It can be seen from the table that highest B:C ratio of 4.47 was reported in brinjal (var. 'Akhita' and 'JK') followed by tomato ('Lakshmi' and 'F1 hybrid') with B:C ratio of 3.73, both the crops had an added yield advantage of 13.0% over their check.

**Table 5: Performance of demonstrations on vegetable production**

FFP Centre/ Name of Crop	Demonstrated variety	Demo (No.)	Area (ha)	Yield (q/ha)			Net return (₹)		B:C ratio	
				Demo	Control	% increase	Demo	Control	Demo	Control
<b>ICAR-CIFA, Bhubaneswar</b>										
Bitter Gourd	<i>Rushaan</i>	30	2	65.00	50.00	30.00	138859	74187	1.65	1.12
French bean	<i>Arka Komal</i>	40	1.7	100.00	80.00	25.00	217070	102451	2.61	1.58
Cauliflower	<i>Fujiyama</i>	35	2	180.00	150.00	20.00	122688	141143	1.94	1.31
<b>Total</b>		<b>105</b>	<b>5.7</b>							
<b>ICAR-IIWM, Bhubaneswar</b>										
Okra	<i>Samrat, F1 hybrid</i>	15	0.8	136.02	123.66	10.00	167040	142320	1.59	1.35
Tomato	<i>Lakshmi, F1 hybrid</i>	25	2.5	266.52	235.86	13.00	420540	359220	3.73	3.19
Bitter Gourd	<i>US 1315, F1 hybrid</i>	08	0.9	113.00	101.81	10.99	264500	219740	1.41	1.17
Brinjal	<i>Akhita, JK</i>	45	9.5	232.79	206.01	13.00	570870	490,530	4.47	3.84
Cabbage	<i>Royal Ball (BC-51), Namdhari -NS 43</i>	22	2.5	264.91	240.83	10.00	367320	319160	2.26	1.96
<b>Total</b>		<b>115</b>	<b>16.2</b>							
<b>ICAR-NRRI, Cuttack</b>										
Okra	<i>Shivansh F1</i>	25	0.8	187.5	112.5	66.67	156250	105635	2.25	1.8
Cucumber	<i>Rainy special</i>	56	4.8	156.25	106.25	47	140625	65200	2.50	1.6
Bitter Gourd	<i>US 1315 F1, Rushan F1</i>	55	3.2	218.75	156.25	40	250000	125000	3.33	1.67
Watermelon	<i>Ice Box F1</i>	25	1.6	156.25	--	--	93500	--	2.87	--
Tomato	<i>Mithili F1</i>	20	0.64	250	187.5	33.33	200000	130000	3.0	2.0
Ridge Gourd	<i>NZ/1001</i>	50	1.2	156.25	112.5	44.44	206250	118750	2.94	2.1
<b>Total</b>		<b>231</b>	<b>12.24</b>							
<b>OUAT, Bhubaneswar</b>										
Pumpkin	<i>Tokita hybrid Vimal</i>	45	7.5	325.0	150	117	193411	34066	2.47	1.36
Cucumber	<i>Annapurna hybrid 'Rajmata'</i>	16	4.2	207.0	125	66	186429	35000	2.5	1.45
Papaya	<i>Red Lady 782</i>	05	2.5	292.0	87	235	207960	37115	2.46	1.55



FFP Centre/ Name of Crop	Demonstrated variety	Demo (No.)	Area (ha)	Yield (q/ha)			Net return (₹)		B:C ratio	
				Demo	Control	% increase	Demo	Control	Demo	Control
Papaya +Pointed gourd in trellis	<i>Swarna Alokik</i> <i>Red Lady 782</i>			392	292	97	470400	207960	2.8	2.46
<b>Total</b>		<b>66</b>	<b>14.2</b>							
<b>Grand Total</b>		<b>517</b>	<b>48.34</b>							

ICAR-NRRI, Cuttack conducted 231 demonstrations on improved technologies/practices of vegetable production at the farmers' fields covering 12.24 ha area. The details of demonstrations conducted on different vegetable crops are given in Table 5. Out of which, 25 demonstrations were conducted on okra (*'Shivansh F1'*) in the project area covering 0.8 ha. Those demonstrations resulted increase yield to the tune of 187.5 q/ha from 112.5 q/ha earlier, exceeding 67% over control. Additionally, higher net returns observed in demonstrations (₹156250/-) compared to the control (₹105635/-). That translated into a higher benefit-cost ratio (2.25) for the demonstrations than control (1.8).

Similarly, 56 demonstrations on cucumber (*'Rainy special'*) in the project area covering 4.8 ha. Notably, those demonstrations resulted in increase in yield to 156.25 q/ha from 106.25 q/ha with old varieties, exceeding 47% when compared to control. Additionally, higher net returns were observed in demonstrations (₹140625/-) as compared to the local checks (₹65200/-). It caused higher benefit-cost ratio (2.5) for the demonstrations compared to control (1.6). Bitter melon (*'US 1315 F1'* and *'Rushan F1'*) was demonstrated in 3.2 ha through organizing 55 programmes which resulted in increase in yield to 218.75 q/ha from 156.25 q/ha with earlier varieties. Additionally, higher net returns observed in demonstrations (₹250000/-) compared to the control (₹125000/-). That translated to a higher benefit-cost ratio of 3.33 for the demonstrations, compared to 1.67 for the control.



A total of 25 demonstrations on watermelon (*'Ice Box F1'*) in the FFP cluster covering an area of 1.6 ha. Watermelon was not cultivated earlier and reported yield of the demonstrated crop was 156.25 q/ha. The net returns observed in the demonstrations was ₹93500/- with the benefit-cost ratio (B:C ratio) of 2.87. Similarly, 20 demonstrations



on tomato (*'Mithili F1'*) in the project area covering an area of 0.64 ha. Notably, those demonstrations resulted in increase in yield to 250 q/ha from 187.5 q/ha earlier, exceeding 33% when compared to control. Additionally, higher net returns observed in demonstrations (₹200000/-) compared to the local checks (₹130000/-). This translates to a higher benefit-cost ratio (B:C ratio) of 3.0 for the demonstrations, compared to 2.0 for the control. The institute conducted 50 demonstrations on ridge gourd (*'NZ/1001'*) in the project area covering an area of 1.2 ha. It resulted in increase in yield to 156.25 q/ha from 112.5 q/ha earlier, exceeding 44% when compared to control. Additionally, higher net returns observed in demonstrations (₹206250/-) compared to the control (₹118750/-). That translated to a higher benefit-cost ratio (B:C ratio) of 2.94 for the demonstrations, compared to 2.1 for the control.

Table 5 reveals that OUAT centre demonstrated vegetables in 14.2 ha area through conducting 66 programmes during the period under report. A total of 61 demonstrations in 11.7 ha on off-season (September/ February) cultivation of pumpkin (*'Vimal'* and *'Tokita'*) and cucumber (*'Annapurna'* and *'Rajmata'*) hybrids with seedlings raised in pro-tray under poly-house increased the productivity by 117% and 66%, respectively. Introduction of commercial cultivation of hybrid papaya *'Red Lady 782'* in place of local papaya in kitchen garden and nearby homestead land (2.5 ha) through 5 demonstrations resulted 235 % improvement in fruit yield. But, when pointed gourd was grown in inter-row spaces of papaya under trellis system, the productivity was further enhanced by 97% over the sole crop hybrid papaya cultivation. Table shows that the net return and B:C ratio were higher in the demonstration fields than check fields.

## ii) Fruit production

The old project site of ICAR-IIWM at Keonjhar, Odisha was found to be suitable for banana plantation. Accordingly, tissue culture banana (var. *'Grand-9'*) was introduced during 2021-22 with scientific management practices and now, has captured the interest of farmers because of its higher farm and water productivity and better income. A total 3500 saplings of tissue culture banana fruit were planted benefiting 14 farm families covering over 1.0 ha area (Table 6). Usually, tissue culture variety (*'Grand-9'*) of banana plants gets ready for harvesting of fruits between 13 to 14 months of plantation. The findings in the table showed that the demonstrated tissue culture banana variety gave an additional net income of Rs. 68000/- per hectare (16.11% more) over the farmers' available varieties.





**Table 6: Performance of demonstrations of fruit production**

Name of FFP centre	Year of plantation	Age (year) of orchard	Fruit Sp. (Variety)	No. of farm families benefitted	No. of plants	Area (ha)	Yield (q/ha)		Net income (Rs/ha)	
							Farmers practice	Demo	Farmers practice	Demo
ICAR-IIWM, Bhubaneswar	2021-22	1 ½ year	Banana ( <i>Grand-9</i> )	14	3500	1.0	336.7	370.3	422000	490000

### iii) Floriculture

Marigold variety rooted cuttings 'BM 2' was demonstrated in an area of 0.25 ha at 4 farmers' fields by FFP centre OAUT, Bhubaneswar. The average yield of demonstrations was found to be 60 q/ha. Additionally, higher net return was found to be ₹100000/- (Table 7).



**Table 7: Demonstrations of flower production**

Name of FFP centre	Name of Crop	Variety	Demos (No.)	Area (ha)	Yield (q/ha)			Net return (₹)		B:C ratio	
					Demo	Check	% increase	Demo	Check	Demo	Check
Ouat, Bhubaneswar	Marigold (Newly introduced)	<i>Bidhan Marigold-2</i>	04	0.25	60	-	-	100000	-	2.25	-

### iv) Nutri-garden/ backyard nutrition kitchen garden

To ensure the nutritional security and availability fresh green vegetable round the year among the rural households of the project area, a total of 580 demonstrations were conducted which benefitted 580 households. While considering the achievements of different centres under ATARI Kolkata, 100 demonstrations were conducted by ICAR-CIFA benefitting 100 farm families (Table 8). The farm families were provided with assorted seed kit procured from seed portal of ICAR-IIHR, Bengaluru. Further, the importance of nutrition kitchen garden in nutritional security was discussed with farmers so that they can continue this practice in future also. About 400 demonstrations were conducted in three adopted villages of Keonjhar project site benefitting 400 farm families. The farm families were provided with truthful label vegetable seed kits with 12 varieties suitable for *rabi* season. Further, the importance of nutrition kitchen garden in nutritional security was also explained to farmers so that they could continue those practices in future. On the other hand, 80 demonstrations were conducted by ICAR-





NRRI, Cuttack which benefitted 80 farm families. The farm families were provided with assorted seed kit of various vegetables procured from trusted agencies.

**Table 8: Demonstrations of nutri-garden**

Name of FFP centre	Name of Crops	Nutritional gardens demo (No.)	Household benefitted (No.)
CIFA, Bhubaneswar	Okra, Radish, Palak, Cauliflower, Cucumber, Peas, Brinjal, Chilli, French bean and Bitter Gourd	100	100
ICAR-IIWM, Bhubaneswar	Okra, Radish, Coriander, Peas, Brinjal, Chilli, Tomato, Amaranthus, Cowpea, Methi, Spinach and Carrot Rabi vegetables of 12 varieties from NHRDF	400	400
ICAR-NRRI, Cuttack	Okra, Radish, Palak, , Coriander, Cauliflower, Cucumber, Brinjal, Chilli, French bean, Bitter Gourd and pumpkin	80	80
<b>Total</b>		<b>580</b>	<b>580</b>

### 3.3.3 Natural Resources Management (NRM)-based module

Under NRM-based module, four centres under ICAR-ATARI Kolkata conducted 75 demonstration in 12.4 ha area. The ICAR-IIWM, Bhubaneswar conducted 36 demonstrations under NRM based module covering a total area of 4.6 ha (Table 9). Those demonstrations primarily focused on sprinkler irrigation in vegetables and polythene mulching in banana/ grafted brinjal/ sweet corn. A total of 10 demonstrations on sprinkler irrigation in vegetables (Brinjal var. 'Mahygreen') was conducted in an area of 1.6 ha. The average yield of 'Mahygreen' was found to be 227.5 q/ha under demonstration plots which was 12.37 % higher than the local popular check. The net return and B:C ratio of demonstrated variety were found to be Rs. 555000/- and 4.35 as compared to Rs. 479850/- and 3.76 of local check, respectively.

**Table 9: Performance of demonstrations of NRM based module**

Technology demonstrated	Name of Crop	Demonstrated variety	Demos (No.)	Area (ha)	Yield (q/ha)			Net return (₹)		B:C ratio	
					Demos	Control	% increase	Demos	Control	Demos	Control
<b>ICAR-IIWM, Bhubaneswar</b>											
Sprinkler Irrigation in vegetables	Brinjal	Mahy-green	10	1.6	227.5	202.45	12.37	555000	479850	4.35	3.76
Polythene mulching	Banana	Grand-9	14	1.0	370.3	336.7	9.97	620750	521750	2.03	1.63
	Grafted Brinjal	Arka shyama	10	1.0	266.4	206.01	11.89	664200	490530	4.92	3.84
	Sweet corn	Sugar -75	2	1.0	167.7	149.8	11.94	167750	140,900	2.07	2.05
<b>Total</b>			<b>36</b>	<b>4.6</b>							



Technology demonstrated	Name of Crop	Demonstrated variety	Demos (No.)	Area (ha)	Yield (q/ha)			Net return (₹)		B:C ratio	
					Demos	Control	% increase	Demos	Control	Demos	Control
<b>ICAR-NRRI, Cuttack</b>											
Submergence tolerant variety of paddy	Paddy	CR 1009 sub1	39	7.8	62.5	50.0	25.0	86250	60,000	2.91	2.33
<b>Grand Total</b>			<b>75</b>	<b>12.4</b>							

Grafted brinjal (var. 'Arka Shyama') was grown by farmers of the project area due to its high yield potential and extended period of fruiting. The average yield found to be 266.4 q/ha under demonstration plots adopting mulching, while 206.01 q/ha under local check. Higher net return was also recorded under demonstrations (Rs. 664200/-) as compared to the local check (Rs. 490530/-). Similarly, B:C ratio of demonstrations (4.92) was found to be higher than farmers' practice (3.84) as shown in Table 9.



The ICAR-NRRI, Cuttack centre conducted 39 demonstrations under NRM based module covering a total area of 7.8 ha (Table 9). Those demonstrations focused on submergence tolerant variety of paddy (CR 1009 sub1), the average yield of demonstrated variety was found to be 62.5 q/ha, which was 12.5 quintal or 25% higher than the local check. The net return and B:C ratio of demonstrated variety was found to be ₹ 86250/- and 2.91 as compared to ₹ 60000/- and 2.33 of local check, respectively.

### 3.3.4 Livestock-based module

#### i) Dairy production

Total 150 demonstrations involving 150 farmers on dairy animal production were conducted by two centres of this zone during the period under report. As far as livestock-based module of ICAR-NRRI, Cuttack was concerned, a total of 100 demonstrations were conducted related to the supplementation of mineral mixture of dairy animals. Increase in milk yield due to mineral supplements were recorded from 3.5 litre to 4.5 litre per animal with enhancement of 29% (Table 10). The net return and benefit-cost ratio under demonstrations conducted were found to be 17.2 per litre and 1.97 in comparison to ₹ 13.6/- per litre and 1.63, respectively.



Under this model, OUAT centre conducted 50 demonstrations on health care of dairy animals for livelihood and nutritional security of farmers. For dairy animals, the team of veterinary scientist also carried out many activities to enhance milk yield of dairy animals through vaccination for diseases like Haemorrhagic Septicaemia (HS), Black Quarter (BQ) and FMD (Foot and Mouth Disease), routine deworming and mineral mixture/vitamins supplementation in the feed. Few deworming medicines and vitamins were distributed with the help of line departments. Capacity building training programme on scientific dairy farming, oestrous synchronization, nutritional management and adopting hygienic measures for improvised animal health care were organized and twenty five repeat breeding cows with single birth were identified for therapeutic intervention and timely AI to promote crossbreeding for enhancing milk production.

**Table 10: Performance of demonstrations on mineral mixture, bypass fat and prevention of mastitis**

Name of FFP Centre	Technology demonstrated	Demo (No.)	Farmers benefited (No.)	Milk production (litre/animal/day)			Net return (Rs./litre)		B:C ratio	
				Demo	Control	% increase	Demo	Control	Demo	Control
ICAR-NRRI, Cuttack	Mineral mixture	100	100	4.5	3.5	28.57	17.2	13.6	1.97	1.63
OUAT, Bhubaneswar	Dairy (Vaccination, supply of mineral mixture and de-worming in convergence with line departments. Capacity building by giving them training on scientific management and rearing of dairy animals and Organised Animal Health camp)	50	50	4-5	2-3	167	3290	1910	2.5	1.31
<b>Total</b>		<b>150</b>	<b>150</b>							

### ii) Goat production

About 25 demonstrations on vaccination, supply of mineral mixture and de-worming, capacity building training for scientific management and rearing of 'Ganjam' goats were conducted by OUAT centre. Introduction of superior 'Ganjam' breed buck and with proper healthcare, the mortality rate of animals reduced from 20% to 3.95 % over the year 2017 to 2023. The net return was also increased in demonstrated over control (Table 11).





**Table 11: Performance of demonstrations on goats**

Name of FFP Centre	Technology demonstrated	Demo (No.)	Farmers benefited (No.)	Body Weight (kg/animal/day)			Net return (Rs./litre)		B:C ratio	
				Demo	Control	% increase	Demo	Control	Demo	Control
OUAT, Bhubaneswar	Goatery (Vaccination, supply of mineral mixture and de-worming in convergence with line departments. Capacity building by giving them training on scientific management and rearing of dairy animals and Organised Animal Health camp)	25	25	16-17	14-15	40	5950	3250	6.9	4.25
<b>Total</b>		<b>25</b>	<b>25</b>							

### iii) Poultry production

Backyard poultry farming plays an important role in improving the economic situation and meeting out the protein needs of households for nutritional security. In this Zone, 81 demonstrations involving 128 farmers and 950 birds were organized by three FFP centres. During 2022-23, ICAR-CIFA promoted the backyard poultry breeds viz. 'RIR' and 'Kaveri' in the operational area. Table 10 indicates that a total of 30 demonstrations benefitting 30 farmers with 600 birds of different breeds were conducted. Those demonstrations resulted in increase in yield (meat & egg production) from 90 kg/unit to 140 kg/unit, exceeding 55.6% when compared to local checks. Higher net returns were observed in demonstrations (₹16920/-) compared to the local checks (₹6920/-). That translated to a higher benefit-cost ratio for the demonstrations compared to local checks.



ICAR-NRRI, Cuttack promoted the backyard poultry of 'Vanaraja' strain in the cluster. Table 12 also indicates that a total of 48 demonstrations were conducted involving 48 farmers benefited with 50 birds. As the intervention was new and nobody was rearing





poultry, no comparison could be made. Farmers were getting on an average 80 kg meat and 3750 number of eggs. Average net return was reported to be ₹16200/- with the benefit-cost ratio of 2.0.

In the year 2022-23, OUAT promoted the backyard poultry breeds viz. 'Vanaraja'. A total of 50 demonstrations were conducted with 300 birds which provided an employment opportunity to the rural unemployed youth and women farmers.

**Table 12: Performance of demonstrations of backyard poultry-based module**

Name of FFP Centre	Name of breed	Backyard poultry Units (no.)	Farmers benefited	Total Birds (no.)	Meat and egg Production (kg/unit)			Net return		B:C ratio	
					Demo	Control	% increase	Demo	Control	Demo	Control
ICAR-CIFA, Bhubaneswar	RIR, Kaveri	30	30	600	140.0	90.0	55.6	16920	6920	1.53	0.62
ICAR-NRRI, Cuttack	Vanaraja	48	48	50	80 kg +3750 egg	--	85	16200	--	2.0	--
OUAT, Bhubaneswar	Vanaraja	3	50	300	1.8-2	1.2	66	220	80	3.2	1.8
<b>Total</b>		<b>81</b>	<b>128</b>	<b>950</b>							

#### iv) Fish production

Fish farming was an important economic activity carried out in individual ponds as well as in community water bodies. Contribution of fish in nutritional security of the people can not be overstated. Two FFP centres of ICAR-ATARI Kolkata conducted 190 demonstrations in 7.92 ha pond area during 2022-23. ICAR-CIFA centre promoted the scientific aquaculture. Table 13 indicates that 150 demonstrations were conducted with IMC (Rohu, Catla and Mrigal). Additionally, exotic carps (Silver Carp, Grass Carp and Common Carp) were also included in the demonstrations which aimed towards improving productivity. The yield in demonstrated pond was higher (30 q/ha/year) compared to 23 q/ha/year in control. Additionally, higher net returns were observed in demonstrations (₹124500/-) compared to the local checks (₹92100/-). That caused higher benefit-cost ratio than the local checks.



ICAR-NRRI, Cuttack conducted 40 demonstrations in 1.92 ha pond with IMC. Yield in demonstration pond was recorded to be 50 q/ha/year with the net returns of ₹395000/- and benefit-cost ratio of 2.1 (Table 13).



**Table 13: Performance of demonstrations of composite carp culture module**

FFP Centre/ Name of Crop	Demonstrated variety	Demo (No.)	Area (ha)	Yield (q/ha)			Net return (₹)		B:C ratio	
				Demo	Con- trol	% in- crease	Demo	Control	Demo	Con- trol
ICAR-CIFA, Bhu- baneswar	Rohu, Catla, Mrigala and Exotic carp	150	6	30.00	23.00	30	124500	92100	1.55	1.09
ICAR-NR- RI, Cuttack	Rohu, Catla and Mrigala (introduced for the first time)	40	1.92	50.00	-	30	395000	-	2.1	-
<b>Total</b>		<b>190</b>	<b>7.92</b>							

### 3.3.5 Enterprise-based module

In enterprise-based module, demonstrations were conducted for income generating activities like beekeeping, mushroom production, vermi-composting, value addition and marketing by farmer groups.

#### i) *Beekeeping*

Beekeeping can serve as a profitable supplementary venture for small and marginal farmers as well as unemployed youths and farmwomen for substantial income generation. Under FFP, ICAR-NRRI, Cuttack conducted 20 demonstrations on beekeeping with providing total 20 bee boxes (Table 14) which benefitted 20 bee keepers. The average honey production was reported to be 6 kg/box with the net return of ₹600/- per box with B:C ratio of 1.2.

**Table 14: Performance of demonstrations of beekeeping**

Name of FFP Centre	Type of demonstra- tion	No. of beekeep- ing units	No. of boxes	Famers benefit- ed	Average honey pro- duction (kg/box)	Economics of Demo (Rs.)			
						Gross cost	Gross return	Net return	B:C ratio
ICAR- NRRI, Cuttack	Bee Keeping (Introduced for the first time)	20	20	20	6	3000	3600	600	1.2
<b>Total</b>		<b>20</b>	<b>20</b>	<b>20</b>					

#### ii) *Mushroom production*

The ICAR-ATARI Kolkata through its three centres conducted 174 demonstrations on mushroom production during 2022-23 involving 214 farmers. The IIWM centre organized 60 demonstrations for 100 farmers on paddy straw mushroom production with the aim of enhancing the income and nutritional security of the farm families under the project. The average yield was recorded to be 1.2 kg/bed with a net return of



Rs. 170/- per bed and B:C ratio of 2.42. Cultivation of mushroom was promoted among 100 beneficiary farmers (Table 15).



Under FFP, the ICAR-NRRI centre laid out 34 demonstrations on mushroom production with the aim of enhancing their income and nutritional security of the farm family under the project. The average yield was recorded at 1 kg/bed with net return of ₹115/- bed and B:C ratio of 2.76 (Table 15). Whereas, OUAT centre conducted 80 demonstrations on paddy straw and oyster mushroom production. Cultivation of mushroom was promoted among 80 farmers wherein the average yield was recorded 0.850 kg/ bed and net return of ₹87.5/bag with B:C ratio of 2.5.

**Table 15: Performance of demonstrations of mushroom production**

Name of FFP Centre	Name of mushroom variety	No. of demo units	Farmers benefitted	Quantity produced (kg)	Expenditure incurred (Rs)	Selling price (Rs/kg)	Gross income (Rs)	Net income (Rs)	B:C Ratio
ICAR-IIWM, Bhubaneswar	Paddy straw mushroom	60	100	1.2	70	200	240	170	2.42
ICAR-NRRI, Cuttack	Paddy straw mushroom	34	34	1.00	65	180	180	115	2.76
OUAT, Bhubaneswar	Paddy straw	50	50	1.5	42000	200	96000	54000	2.28
	Oyster Mushroom	30	30	0.48	30000	50	75000	45000	2.5
<b>Total</b>		<b>174</b>	<b>214</b>						

### iii) Vermicomposting

Solid wastes and animal manures should be decomposed properly to settle organic carbon in the soil. To promote proper solid waste management, a total of 12 demonstrations were conducted on vermi compost production by three FFP centres under this zone during 2022-23. At Keonjhar cluster, ICAR-IIWM established 12 vermi-compost units at farmers' fields (Table 16). With this technology, farmers were getting more income by applying the vermi-compost in the field crops and particularly in the vegetable fields due to saving of fertilizers cost and quality production. ICAR-IIWM took an initiative to involve self-help groups (SHGs) in the project areas for making vermi compost units as well as selling the products to the consumers directly.

A total of 30 demonstrations were conducted on vermi compost technology in the FFP clusters of NRRI centre. Quantity produced per unit was about 1000 kg/ unit



with the net income of about ₹5000/- unit (Table 16). It enhanced net income of Rs. 5000/- per unit.

The OUAT established 25 vermi-compost units (3 vermi-beds were provided by our project and 22 vermi-beds supplied in convergence with Odisha Govt. Horticulture department). With this technology, farmers were getting more income with



net return of Rs. 4800/- per unit. Eight progressive farmers established mushroom spawn production units which resulted sale of 1374 spawn bottles @Rs. 18-20/- per bottle with net return of Rs. 19300/- (Gross income was Rs. 28300/- and cost of production was Rs. 9000/-).

**Table 16: Performance of demonstrations on vermicomposting**

Name of FFP centre	Vermi-compost units (No.)	Farmers benefitted	Quantity produced (kg)	Selling price (Rs/kg)	Gross income (Rs)	Net income (Rs)
ICAR-IIWM, Bhubaneswar	12	72	500	5	2500	2500
ICAR-NRRI, Cuttack	30	30	1000	10	10000	5000
OUAT, Bhubaneswar	25	25	480	10	4800	4800
<b>Total</b>	<b>67</b>	<b>127</b>				

#### iv) Flour, dal mill and bori making

For landless farmers, unemployed youth and women farmers, one of the SHG (Om Shiva Shankar) empowered with supply of spa dal mill and flour mill which ensured net income Rs. 35000/- to Rs. 50000/- per year. Recently, four SHGs were established in the

cluster by NRRI centre. They were provided with *bori* making machine under the project and they were marketing their produce in the local markets. OUAT also took the initiative to establish SHGs on tailoring, processing and marketing of diverse products. Those SHGs were reaping substantial net returns by selling quality products to the consumers directly. The details of SHGs and the product marketed by the SHGs are provided in the Table 17.





**Table 17: Marketing of products by self-help groups**

Name of FFP centre	Name of the group	No. of members in group	Name of products which are marketed by the group
<b>ICAR-NRRI, Cuttack</b>	Blue Star	5	Blackgram, Bori making & marketing
	Lord Madanmohan	5	-do-
	Gopinath	5	-do-
	Mohan Baba	5	-do-
<b>OUAT, Bhubaneswar</b>	Shiva Shankar Mahila Mandal	15	Pickle, Papad, ginger powder, turmeric, Maize & Mandua atta, Green gram dal, Coriander powder, Black pepper powder, Black gram dal, Lentil dal, Pigeon pea dal, Bengal gram dal

### 3.3.6 Integrated Farming Systems (IFS)-based module

During the period of reporting, under this module, Agri-Hort.-Poultry and Fish-Hort.-Dairy IFS model were established by NRRI and CIFA centre, respectively. Table 18 depicts the details of IFS model with annual net income per ha land.

**Table 18: Performance of integrated farming system-based module**

Name of FFP centre	Name of IFS	Components of IFS	Area (ha)/unit	Expenditure incurred (Rs)	Selling price (Rs/q) or Rs/Lt	Gross income of produce (Rs)	Net income (Rs)	Total expenditure incurred (Rs/ha)		Gross income of produce (Rs/ha)		Net income (Rs/ha)	
								IFS	Conventional	IFS	Conventional	IFS	Conventional
<b>ICAR-NRRI, Cuttack</b>	Agri - Horti. - Poultry	Paddy	2.4	111000	2100	277200	166200	46250	45000	120750	105000	74500	60000
		Poultry	0.4	13950	14000	12600	9600	8000	0	17600	0	9600	0
		Horti.	0.05	5280	6000	26500	21220	5280	0	26500	0	21220	0
		<b>Total</b>	<b>2.85</b>	-	-	-	-	<b>59530</b>	<b>45000</b>	<b>164850</b>	<b>105000</b>	<b>105320</b>	<b>60000</b>
<b>ICAR-CIFA, Bhubaneswar</b>	Fish - Horti. - Dairy	Spine gourd	0.09	20000	3000	40000	20000	220000	180000	440000	370000	220000	190000
		Pointed gourd	0.09	15000	1500	30000	15000	160000	140000	320000	280000	160000	140000
		Marigold	0.03	5000	-	25000	20000	62000	0	312000	0	250000	0
		Cauliflower	0.04	3000	-	8000	5000	75000	70000	200000	145000	125000	75000
		Dairy	1 (3 cows)	6000	30 Rs/Lt	12000/month	6000/month	6000	5500	71000	64000	37000	32000
		Aquaculture	0.40	47000	140 Rs/Kg	112000	37000	188000	162000	280000	250000	92000	82000
<b>Total</b>			<b>0.65</b>	-	-	-	-	<b>711000</b>	<b>557500</b>	<b>1623000</b>	<b>1109000</b>	<b>884000</b>	<b>519000</b>



### 3.4 Partnership and institution building

#### A) Convergence with other organizations

All four FFP centres of ICAR-ATARI, Kolkata established partnership and institution building with various organization in the state during the year 2022-23. ICAR-CIFA forged collaboration with Farmer Producer Companies, Central Poultry Development Organization, Odisha University of Agriculture and Technology, Odisha State Seed Corporation Limited etc. to harness the power of convergence. Within this framework, the ICAR-IIWM established partnerships with diverse multi-stakeholders as detailed in the Table 19 showcasing the breadth and depth of collaborative efforts established to amplify the effectiveness of project activities. ICAR-NRRI had collaboration with Farmer Producer Companies (FPCs), Directorate of Poultry Research (DPR), Bhubaneswar; Central Horticultural Experimental Stations (CHES), Bhubaneswar; Odisha University of Agriculture and Technology; Odisha State Seed Corporation Limited etc. to spread the technologies in the district. Likewise, the team of OUAT employed the powerful strategy of convergence. The centre established partnerships with diverse multi-stakeholders, including village panchayats, Krishi Vigyan Kendras (KVKs), State Department of Agriculture, State Department of Horticulture, State Department of Veterinary Sciences, AICRP on Mushroom, OSSC, OLIS and OSSOPCA.

**Table 19: Detail of partnership and institution building through convergence**

Name of FFP centre	Organization with which partnership for institution building developed (No.)
ICAR-CIFA, Bhubaneswar	4
ICAR-IIWM, Bhubaneswar	6
ICAR-NRRI, Cuttack	8
OUAT, Bhubaneswar	7
<b>Total</b>	<b>25</b>



## B) Linkage with Farmer Producer Companies

At OUAT Centre, training on organic farming was imparted to the farm women of village Bhogada, Begunia in association with Begunia Adarsha Women Farmers Producer Company Limited (BAWFPCL), Kolhuapatna, Begunia, Khordha. Forty participants from Bhogada village were demonstrated about Jivamruta, Panchagavya preparation and organic pest control using bio products and pheromene traps. Training on paddy straw mushroom cultivation was imparted to the farmwomen of Begunia Adarsha, Srirampur, Sananayapalli & Thanapalli village, Biswalpada, Benapanjuri, Muslimsahi, Benapanjuri and Panchupalli in association with Begunia Women Farmers Producer Company Limited (BAWFPCL), Kolhuapatna, Begunia, Khordha district. The procedure of paddy straw mushroom bed laying was demonstrated to the farmwomen. The participants also practiced the method of bed laying through learning by doing.

## C) Establishment of 'Aqua Chaupal'

The 'Aqua Chaupal', developed by ICAR-CIFA, Bhubaneswar for promoting farmer to farmer learning, was inaugurated by Padmashree awardee farmer Shri Batakrushna Sahoo at Sarakana. 'Aqua Chaupal' is a place where fish farmers can sit together and discuss fishery related issues to improve decision making ability and to develop interpersonal skills among them. The Chaupal located close to the Sarakana fish farm served as a platform and attracted potential fish farmers to gather and discuss about the issues faced by them in fish farming practices.

## D) Establishment of 'One stop aqua shop'

It was established in Naroda, Balipatna by CIFA centre. It met the needs of the member farmers (quality fish seed, feed, medicines and other inputs) at one location in order to strengthen Bhargabi Fish Farmers Producers Company Limited. Additionally, it served as a sales outlet for member's high-quality fish. Technologies and package of practices adopted from IIHR, OUAT and CIFA. 'Aquaculture Field School' as a model of farmer-to-farmer extension which was promoted among the fish farmers.

## 3.5 Content mobilization

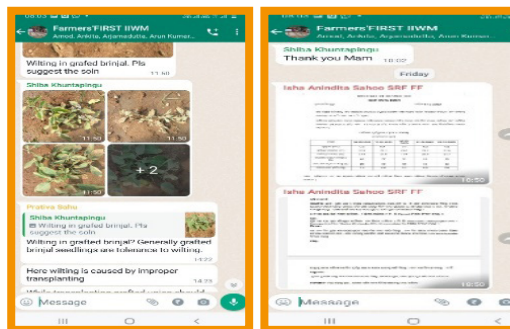
As per the data in the Table 20, ICAR-IIWM published 3 activities in local newspapers. To enhance technical communication, two dedicated *WhatsApp* groups were created for old and new clusters, through which 250 relevant messages were shared with 160 farmers and farmwomen in the project area. Farmers of the project area were also connected with 'Kisan Sampark Sutra', a unique digital platform, for enabling 'farmers-scientists interface' conducted every fortnightly by ICAR-IIWM to provide scientific knowledge on advanced agricultural knowhow to the farmers of adopted villages.

ICAR-NRRI centre published 12 extension literature of various aspects which were distributed among over 4000 farmers. To enhance technical communication, 2 *WhatsApp*



groups were created with 84 members through which 145 relevant messages were shared. Furthermore, 5 videos, developed by the centre, on pertinent aspects were also shared with the farmers of adopted villages (Table 18).

The OUAT centre created 5 WhatsApp groups through which 65 relevant messages were shared with 390 farmers in the project area. Eight videos, developed by the centre, on agriculture and allied sectors were communicated for the benefit of the farmers. On the other hand, CIFA centre prepared one booklet which distributed 200 farmers and the centre also developed one video for the farmers (Table 20).



**Table 20: Detail of content mobilization by FFP centres**

Name of FFP centre	Extension literature developed for farmers (leaflets/pamphlets/etc.)		Booklets prepared on different technologies		WhatsApp			No. of videos developed
	Extension publications (No.)	Distributed to farmers (No.)	No. of booklets	Distributed to farmers (No.)	No. of groups created	No. of farmers	No. of messages sent	
ICAR-IIVM Bhubaneswar	0	0	0	0	2	160	250	0
ICAR-NRRI, Cuttack	12	4000	0	0	2	84	145	5
OUAT, Bhubaneswar	0	0	0	0	5	390	65	8
ICAR-CIFA, Bhubaneswar	0	0	1	200	0	0	0	1
<b>Total</b>	<b>12</b>	<b>4000</b>	<b>1</b>	<b>200</b>	<b>9</b>	<b>634</b>	<b>460</b>	<b>14</b>

One Coffee Table Book entitled '*Pioneer Farmers: Agri-sustainability through Farmer FIRST Approach*' was compiled, edited and published by ICAR-ATARI, Kolkata during this period. The book reflected detail information about the successful farmers and their achievements resulting from adopting latest technologies provided under Farmer FIRST Programme being run at four project institutes in Odisha. That document spelled out the income-enhancing stories of intrinsic modules of fruitful technology application i.e. farmer-scientist interface, technology assemblage, application and feedback, partnership and institutional building and content mobilization through e-enabled knowledge sharing.







## 4 TECHNOLOGY POPULARIZED

During the year 2022-23, many technologies have been popularized in FFP adopted and surrounding villages which are presented below as per different centres/ institutes.

### I) *OUAT, Bhubaneswar*

#### ❖ **Intercropping of pointed gourd in trellis with papaya cultivation**

Commercial cultivation of papaya started in the year 20218-19 in the old adopted villages of Farmers FIRST Programme which generated a net profit of Rs. 207960/- per ha. Subsequently, in convergence with Horticulture Dept., Govt. of Odisha, for better utilization of the inter-row spaces in papaya, pointed gourd was intercropped in trellis system which further enhanced the profit to Rs. 367920/- per ha during 2022-23. Now, the technology is gaining interest among the farmers and 4-5 similar units developed till date.

#### ❖ **Use of rice in mushroom spawn production technology**

Six to eight progressive marginal/ landless farmers were trained on details of the spawn production technology. Wheat was generally used as substrate for mushroom spawn production but it was not available throughout year. Paddy was tried as an alternate of substrate for spawn production and it was established through FFP interventions. Now, the farmers are well trained with the technical know-how about the use of paddy as substrate for spawn production. The spawn produced by them were of good quality with less contamination which were preferred by the farmers of nearby adopted villages. It reduced their transportation cost of procuring spawn bottles from other places. In the year 2022-23, out of 1497 paddy straw spawn bottles, 118 bottles were contaminated and 1374 bottles were sold @ Rs.18-20/- per bottle which generated net profit of Rs.19300/- (Gross income Rs. 28300/- and cost of production Rs.9000/-). The technology has been adopted more than 30 farmers in the villages.

### II) *ICAR-CIFA, Bhubaneswar*

#### ❖ **Carp seed rearing**

Quality fish seed is a critical input for successful aquaculture. Under Farmer FIRST Project operated by ICAR-CIFA carp seed rearing in backyard pond has been promoted. A small pond measuring 0.15 hectares was used as a demonstration site for carp seed rearing. Prior to adopting the new technology package, the farmer used to get around 5 quintals of table fish production in one year. After adopting the new technology, the farmer was able to harvest fingerlings in just three and a half months. A total of 7 lakh carp spawn had been stocked, resulting in the production of 2.4 lakh carp fingerlings. He earned Rs. 84000/- from the sale of carp seeds. From the remaining seed, he was able



to get around 3 quintals of table fish with a return of Rs. 36000/-. The overall profit from fish seed rearing and grow-out culture was Rs. 75000/-, which was 2.15 times higher than the previous enterprise. Due to the success observed, 20 other farmers in Baliaanta and Balipatna blocks of Khordha district switched to carp seed rearing, indicating the positive impact and scalability of the intervention.

### III) ICAR-NRRI, Cuttack

#### ❖ Low-cost paddy straw mushroom production technology

Paddy straw mushroom cultivation can be started with a very minimum capital investment and it does not need any sophisticated equipment/ techniques. It involves: (i) preparation of mushroom bed (12-13 kg straw per bed); (ii) soaking, use of hot water and disinfectants for sterilization, (iii) keeping mushroom spawn (seed) and pulse seed on the bed (with uniform spreading); (iv) Spraying water to keep the bed moist; and (v) harvesting of the mushroom in about a week. It can be harvested thrice during a period of one month from the first fruiting. About 1.2 to 1.5 kg mushroom can be harvested per bed. The NRRI FFP Centre trained more than hundred beneficiaries in mushroom cultivation and incubated ten youths for mass production and marketing of mushrooms (paddy straw) as producers cum suppliers as start-ups.

### IV) ICAR-IIWM, Bhubaneswar

#### ❖ Use of poly-mulching technology for water conservation in crops / horticultural production

Adoption of water management practices in crops and horticultural production has increased among the farmers in Keonjhar district of Odisha. Water conservation measures such as micro irrigation, poly-mulching and ground water harvesting have been widely adopted in the project area contributing higher farm income and improving livelihood of farmers. Among those above measures, poly-mulching technology has been proven to be the most effective way for farmers to increase their income through reducing cost of production. More than 60 farmers cultivated sweet corn, grafted brinjal, banana etc. using poly-mulching during the year 2022-23.

#### ❖ Popularized hybrid sweet corn (var. 'Sugar-75') production

The sweet corn (var. 'Sugar-75') cultivation was demonstrated for the first time under FFP in the fallow land of Keonjhar district where rainfall was limited during summer season. The poly-mulching technology was practiced to use available soil moisture and minimum irrigation was provided for the cultivation. In the year 2022-23, two SHGs in Mallarpada and Jamuda villages of Keonjhar district used the technology resulting net profit of around Rs. 60000/- per acre with B:C ratio of 2.65. The technology attracted other farmers and SHGs in the adopted and nearby villages. In the current year, more than 15 farmers have adopted this farming.



### ❖ **Line transplanting and herbicide application in paddy**

During *kharif* 2022, over forty rice farmers had been adopted line transplanting methods in the adopted cluster, while using short duration hybrid paddy seeds suiting their ecologies. Farmers have widely adopted pre-emergence herbicide '*Londax Power*' for weed control in paddy, saving labour cost to the tune of about Rs. 5000.00 per ha against manual weeding without affecting yield.

### ❖ **Popularized non-chemical methods of pest control in horticultural production**

The adopted cluster being tribal-dominated, Integrated Pest Management (IPM) was successfully adopted in horticultural production in form of using pheromone traps, yellow sticky traps, neem oil and light traps. It reduced the use of chemical pesticides significantly and protected environmental health. More than 20 farmers practiced those methods during the period of report.

### ❖ **Backyard poultry farming and nutritional garden**

Adoption of back yard poultry farming with dual purpose breeds like '*Aseel*' and '*Kadakhnath*' has boosted the family income and nutritional security and uplifted livelihood of rural landless poor farmers. This has been adopted by about 150 farmers in three adopted villages and by over 100 farmers in the adjoining villages for improving rural economy. About 400 farm families have established nutri-garden which not only ensured nutritional security of rural households but contributed also to the additional family income to the small land holders.

### ❖ **Mushroom and vermi-compost production**

Over 60 women farmers from 12 SHGs from the adopted cluster have adopted mushroom cultivation and vermi-composting for generating additional income for their families. They are jointly producing and marketing in an enterprise mode. This has contributed to the economic as well as social empowerment of farmwomen in the cluster.



## 5 INSTITUTE-WISE BEST SUCCESS STORY

The farmers fetched substantial profit from their agri-business through adopting the best possible interventions of their identified problems in the production systems. The best success story of farmers, documented under the projects, have been discussed as below.

### *1) OUAT, Bhubaneswar*

<b>Name of the farmer</b>	: Sri Subash Behera
<b>Address</b>	: Vill.-Brahmapura, Parichhal, Khordha, Odisha
<b>Contact number</b>	: 09090746452 (M)
<b>Age</b>	: 43 years
<b>Sex</b>	: Male
<b>Education</b>	: Madhyamik pass
<b>Size of land holding</b>	: 2 ac
<b>Institute involved</b>	: OUAT, Bhubaneswar



There were grievances from farmers that yields were not up-to the mark or even reduced in spite of more investments as input costs. The studies and reports recommended that the income would further going to be reduced due to threat of climate change. In addition, non-adoption of improved package of practices by the farmers for raising their crops was another important reason towards low farm income. Looking at the adversities of climate change on agriculture, careful selection of crops/varieties, change in management package of practices with climate resilient technologies etc. were the measures to mitigate those climatic changes and for getting higher agricultural production. Not only that, timely availability of adequate quantity of quality seeds and agri-inputs were also the challenges in improving farm productivity in the climatic conditions of Odisha.

Like other small and marginal farmers of village- Brahmapura, Block- Parichhal, District- Khordha, Odisha, Sri Subash Behera were also dependent on paddy cultivation for their livelihood. Mr. Behera was cultivating his 2 ac land with traditional paddy varieties ('*Budhaujoga*' and '*Ratnachudi*') along with rearing of few poultry birds in his backyard. The income was not sufficient enough to satisfy the basic needs of his family which caused frustration to adopt agriculture as a profession. Under such circumstances, he was compelled to work as labourer in other's fields. The problems of low income from his land was vividly discussed with the scientists concerned and he was suggested with similar commodity approach to use high yielding variety seeds and good quality



poultry breeds/ strains along with scientific crop and livestock management practices to improve his farm income. As a result, he was supplied with 'Swarna sub-1' and 'Kadakhnath' poultry. For better utilisation of paddy straw, he was also advocated to grow mushroom which could provide him year round additional income.

## Economics of production

### Before intervention (2016-17)

Components	Area (Ac)/No.	Production	Gross income (Rs.)	Net income (Rs.)	B:C Ratio
Paddy (Budhaujoga and Ratnachudi)	2.00 ac	20.00 q	24000	11000	1.8
Poultry (Local)	10 no.	1000 Eggs/ 5 birds sold	8000	5000	4.0
<b>Total</b>			<b>32000</b>	<b>16000</b>	<b>2.0</b>

### After intervention (2022-23)

Components	Area (Ac)/No.	Production	Gross income (Rs.)	Net income (Rs.)	B:C Ratio	Per cent increase due to intervention	
						Production	Income
Paddy (Swarna sub 1)	2.00 ac	35.00 q	64750	33500	2.07	75	204
Poultry (Kadakhnath)	30 no.	3000 Eggs/ 12 birds sold	36240*	28000	4.4	200 (eggs) 140 (meat)	460
Paddy straw mushroom	500 beds	3.5 q	56000**	21000	1.6		
<b>Total</b>			<b>156990</b>	<b>82500</b>	<b>2.1</b>		

\* Per Kadakhnath bird sold @ Rs.520/-, per egg sold @ Rs. 10/-; \*\*Cost of cultivation @ Rs. 70/-, mushroom production @Rs. 0.700 g/ bed and selling price @ Rs. 160/- per kg

Before Farmers FIRST Programme intervention, Mr. Behera was hardly getting 20 qtls of paddy from his entire 2 ac of land from which he could be able to realise Rs.11000/-.

Additionally, he also realise Rs. 5000/- from rearing poultry in his backyards. The annual farm income in total was Rs.16000/- before the intervention of the Farmers FIRST Project.





After receiving the seed as critical inputs and training on scientific raising/ rearing crop/ poultry, he cultivated accordingly and realised Rs. 33500/- from paddy, Rs. 28000/- from poultry and Rs. 21000/- from mushroom. Line transplanting, soil test based fertilizer use and weed management were among the improved agro-technologies he followed. Twenty days old 'Kadakhnath' chicks were provided with proper vaccination, vitamin supplementation and scientific feeding which caused reduction in chick mortality and improvement in meat production. Table clearly depicted the substantial increase of net income from his business. Recently, more than 20 farmers adopted such type of farming in the adopted villages.

## II) ICAR-CIFA, Bhubaneswar

<b>Name of the farmer</b>	: Sh. Bishnu Charan Nayak
<b>Address</b>	: Village- Purohitpur, Block- Baliana, District- Khordha, Odisha
<b>Contact number</b>	: 9668312120 (M)
<b>Age</b>	: 49 yrs
<b>Sex</b>	: Male
<b>Education</b>	: Madhyamik pass
<b>Size of land holding</b>	: 8 ac
<b>Institute involved</b>	: ICAR-CIFA, Bhubaneswar, Odisha



The farmer possesses a large pond of area 1 ac in his farm. But due to lack of knowledge and skill regarding latest scientific technologies of growing Indian Major Carps, it remains under-utilised through major part of the year. Extensive fish farming practices fetches him an annual income of around Rs 100000/-. The farmer started practicing integrated fish farming under the Farmers FIRST Project. The integrated fish farming included the horticultural crop (bitter gourd and cauliflower) along with dairy farming. After adopting the integrated farming system the farmer started earning an annual income of around Rs. 210000 /- with an increase of 110 percent from its previous income.

ICAR-Central Institute of Freshwater Aquaculture is a premier institute for research on freshwater aquaculture. Among the many technologies the institute has perfected and disseminated, Fish based integrated fish



farming is one. Here fish farming is integrated with several other enterprises- horticulture, dairy, poultry, etc. depending on the resource endowments of the farm. Overall returns



from integrated farming system is much higher than standalone farming. Besides, IFF helps spreading the risk of crop failure and supports household food and nutrition security. Sri Bishnu Charan Nayak was supported by project team in implementing IFF in his farm.

## Economics of production

### *Before interoention (2016-17)*

Components	Area (Ac)/ No.	Production	Gross income (Rs.)	Net income (Rs.)	B:C Ratio
Cauliflower	0.12	1478 kg	18335	9353	2.04
Bitter gourd	0.08	540 kg	33125	12024	1.57
Fish production	1 ac	465 kg	56101	16321	1.41
Dairy farming	3 no.	400 lit/month	12000	6000	2.00
<b>Total</b>			119561	43698	

### *After interoention (2022-23)*

Components	Area (Ac)/No.	Production	Gross income (Rs.)	Net income (Rs.)	B:C Ratio	Per cent increase due to interioention	
						Production	Income
Cauliflower	0.12	1780 kg	22002	10849	1.97	20.43	15.99
Bitter gourd	0.08	730 kg	42400	15030	1.55	35.18	25.00
Fish production	1 ac	620 kg	73492	20074	1.38	33.33	22.99
Dairy farming	3 no.	400 lit/ month	12000	6000	2.00	0	0
<b>Total</b>			149894	51953			

Farmer FIRST project has enabled the farmer double his income level through adoption of improved farming practices. Inspired by his success, five more farmers in Baliana block of Khordha district has developed integrated farming system in their farms with active support by FFP project team. This project has significantly improved their agricultural practices, increased their incomes, expanded their market access, promoted sustainable farming and enhanced food security by addressing the challenges faced by the farmers. In recognition of his success, Sri Bishnu Charan Nayak has been felicitated with 'Innovative Farmer Award' by ICAR-NAARM, Hyderabad on 01.09.2022 under the theme of Doubling Farmers Income.



### III) ICAR-NRRI, Cuttack

<b>Name of the farmer</b>	: Sh. Balaram Jena
<b>Address</b>	: Vill.- Malihata, Block- Salipur, Distt.- Cuttack, Odisha
<b>Contact number</b>	: 08908299972 (M)
<b>Age</b>	: 35 years
<b>Sex</b>	: Male
<b>Education</b>	: Madhyamik pass
<b>Size of land holding</b>	: 5 ac
<b>Institute involved</b>	: ICAR-NRRI, Cuttack, Odisha



Shri Balaram Jena was involved in growing rice, pulses, vegetables and rearing livestock following traditional methods. The old and traditional rice varieties were very much susceptible to pest and diseases. Fertilizer application was imbalanced, especially he was using more urea in rice crop. Micro-nutrient deficiencies had also been reported in vegetable crops. Weed infestations particularly in low land ecologies were major threats when profitability of the rice was concerned. Mechanization, even use of small machines and tools for rice farming were almost absent for which the cost of production was high and losses from crops were very common. After paddy cultivation in the *khari*f season, growing of local black gram and green gram utilizing the residual moisture were in practice. However, Sh. Jena was not aware about commercial cultivation of vegetables, production of mushroom, rearing of poultry, fish farming, vermi-composting and also not aware about their marketing plan for getting good sale value.



### Economics of production

#### Before intervention (2016-17)

Components	Area (Ac)/ No.	Production	Gross income (Rs.)	Net income (Rs.)	B:C Ratio
Paddy	4.00 ac	68.0 q	142800	74800	2.1
Vegetables (Okra)	0.12 ac	6.0 q	12000	6000	2.0
Tomato	0.12 ac	8.4 q	12600	7600	2.5
Fish	0.16 ac	2.0 q	30000	20000	3.0
<b>Total</b>			<b>197400</b>	<b>108400</b>	





### After intervention (2022-23)

Components	Area (Ac)/ No.	Production	Gross income (Rs.)	Net income (Rs.)	B:C Ratio	Per cent increase due to intervention	
						Production	Income
Paddy	4.00 ac	85 q	178500	106500	2.47	25%	25%
Vegetable (Okra)	0.12 ac	10.5 q	21000	14000	3.0	75%	133.3
Tomato	0.12 ac	11.4 q	17100	11600	3.1	35.7%	52.63%
Fish	0.16 ac	3.20 q	48000	35000	3.69	60%	75 %
Mushroom	0.08 ac	16.0 q	288000	168000	2.4	100%	100%
Poultry	100 no.	1.60 q	39000	27000	3.25	100%	100%
<b>Total</b>			<b>591600</b>	<b>362100</b>			



The scientists of FFP centre, Cuttack demonstrated high yielding variety of paddy seeds; NRRI-developed Customised Leaf Colour Chart (CLCC) for optimizing use efficiency of N-fertilizers; commercial hybrid vegetables viz. tomato, cauliflower, okra, pointed gourd, ridge gourd, tissue culture banana cultivation etc.; commercial mushroom cultivation with over 200 beds per months for additional income; backyard poultry farming; commercial fish farming and vermicomposting and power operated sprayer. He was suggested to apply green manuring by Dhaincha and to sow the seeds treated with bio-agent *Trichoderma viridae* @ 10 gm/kg of seed in nursery to get robust seedling with vigorous root growth and also to control the diseases like stem rot biologically. As a result, due to adoption of commercial cultivation of vegetables and introduction of mushroom cultivation and backyard poultry rearing (which involved less investments and high returns), his annual net profit was increased substantially. Shri Balaram Jena was awarded with 'Innovative Farmer Award' on the occasion of Foundation Day celebration of ICAR-NRRI, Cuttack.



#### IV) ICAR-IIWM, Bhubaneswar

**Name of the farmer** : Smt. Gitanjali Naik  
**Address** : Vill.-Jamuda; Block- Saharpada; District-  
Keonjhar, Odisha  
**Contact number** : 09937743877 (M)  
**Age** : 41 years  
**Sex** : Female  
**Education** : Higher Secondary pass (Arts)  
**Size of land holding** : 6.5 acres  
**Institute involved** : ICAR-IIWM, Bhubaneswar



Smt. Gitanjali Naik belongs to the tribal-dominated village Jamuda, Keonjhar, Odisha. Jamuda is generally considered as an underdeveloped village with population of 2170, among which 70.0% (1671) population is from scheduled tribes, 20.23% (439) from scheduled caste and only 2.76% (60) is from general category.

Prior to implementation of Farmer FIRST Programme of ICAR-IIWM in the cluster during 2016-17, Smt. Gitanjali Naik was cultivating only paddy during rainy season using locally available indigenous varieties through traditional practices. Due to lack of knowledge in management of rainwater, pest and disease problems and fertilizers etc. besides non-availability of irrigation facility, her rice crop was being damaged more or less every year. Due of lack of technical knowledge, she was getting very poor yield with a total production of about 75 quintal paddy only from an area of 5.0 acres land with a gross income of Rs. 75000/- only. Before FFP interventions, she used to grow vegetables only for own family consumption. Because lack of irrigation facilities, she couldn't cultivate commercially. Thus, her annual net income was noted as Rs. 18900/- with gross income of Rs. 91300/-.

After getting awareness and skill development trainings on water management technologies, paddy straw mushroom production and vermicomposting and grafting technology of brinjal from the scientists of ICAR-IIWM, Bhubaneswar under FFP, she adopted high yielding and hybrid paddy seeds, proper nursery management, line transplanting, weed control through cono-weeders and balanced application of fertilizers, her paddy production increased significantly over the years to the tune of 105 quintals from same area. Not only that, introduction of brinjal variety '*Mahy Green*', tissue culture banana, tapioca and yam; use of polymulching and micro-irrigation techniques; practicing IPM measures e.g. use of yellow sticky trap, pheromone trap and neem oil; and scientific dairy animal rearing uplifted her gross annual income to Rs. 478300/- with a net profit of approx. Rs. 311900/-.



## Economics of Production

### Before intervention (2016-17)

Components	Area (Ac)/ No.	Production (q)	Gross income (Rs.)	Net income (Rs.)	B:C Ratio
Paddy	5.0 acre	75 q	75000	15000	0.25
Desi cow	01 no.	1 litre per day for 210days @ 30/- per liter	6300	3900	1.62
<b>Total</b>			<b>81300</b>	<b>18900</b>	

### After intervention (2022-23)

Components	Area (Ac)/ No.	Production (q)	Gross income (Rs.)	Net income (Rs.)	B:C Ratio	Per cent increase due to intervention	
						Production	Income
Paddy	5.0 ac	105 q	214200	124000	1.37	40	7.2
Brinjal	0.30 ac	35 q @ 40/- per kg	105000	78000	2.88	-	100
Bitter gourd	0.10 ac	7.5 q @ 40/- per kg	30000	20000	2.10	-	100
Cabbage & cauliflower	0.25 ac	10.5 q @ 20/- per kg	21000	13000	1.62	-	100
Okra	0.10 ac	3.5 q @ 30/-	10500	6500	1.62	-	100
Cowpea	0.05 ac	1.4 q @ 60/-	8400	4400	1.10	-	100
Onion	0.03 ac	1.5 q @ 20/-	3000	2300	3.28	-	100
Tomato	0.10 ac	8.4 q @ 30/-	25200	18700	2.87	-	100
Poultry (Aseel & Kadaknath)	45 no.	26 adult birds sold @ 500/- per bird	13000	10000	3.33	-	100
Desi Cow	03 no.	Sold 5 litre per day for 240 days @ 40/- per liter	48000	35000	2.69	471.42	797.43
<b>Total</b>			<b>478300</b>	<b>311900</b>			



Components	Area (Ac)/ No.	Production (q)	Gross income (Rs.)	Net income (Rs.)	B:C Ratio	Per cent increase due to intervention	
						Production	Income
Desi cow	02 no.	3 litre per day for 210 days @ 40/- per liter	25200	18500	2.76	200	1.93
Total			<b>414300</b>	<b>264400</b>			



Smt. Gitanjali has developed good linkages with ICAR-IIWM, Bhubaneswar; KVK Keonjhar; District Agriculture Office, District Horticulture Office and many others. Motivated by the successes of Smt. Gitanjali Naik, other fellow farmers of the village started cultivating off-season vegetables in their crop fields which helped them immensely for improving their livelihood status. Realizing the efforts and contributions of Smt. Gitanjali in the field of vegetable cultivation, Director, ICAR-IIWM awarded Smt. Naik with 'Best Farmwoman Award' during the 35<sup>th</sup> Institute's Foundation Day on 12<sup>th</sup> May, 2022. Now, she is not only a successful farmer but also has become a role model for other farmers and farmwomen in her village as well as neighbouring villages.





## 6 AWARDS

Name of FFP centre	Name of the Award (poster/paper/any other)	Name of FFP Team/farmers	Awarding agency	Description i.e. title of the poster/paper etc.
ICAR-CIFA, Bhubaneswar	Innovative Farmer Award	Bishnu Charan Nayak	ICAR-NAARM, Hyderabad	'Innovative Farmer Award' under the theme 'Doubling Farmers Income' was awarded by NAARM during its 47th Foundation Day celebrations held at Hyderabad on 1 September 2022.
ICAR-IIWM, Bhubaneswar	Progressive Farmer Award-2022	Mrs. Gitanjali Naik, Jamuda Village	ICAR-IIWM, Bhubaneswar	Honoured during IIWM 35th Institution Foundation day on 12 May , 2022
	Progressive Farmer Award-2022	Mr. Parameswar Naik, Jamuda Village	ICAR-IIWM, Bhubaneswar	Honoured during IIWM 35th Institution Foundation day on 12 May , 2022
	Progressive Farmer Award-2022	Mrs. Meena Mohanta, Khuntapingu Village	ICAR-IIWM , Bhubaneswar	Honoured during IIWM 35th Institution Foundation day on 12May , 2022
	Progressive Farmer Award-2022	Mr. Monaj Mohanta, Khuntapingu Village	ICAR-IIWM , Bhubaneswar	Honoured during IIWM 35th Institution Foundation day on 12 May , 2022
OUAT, Bhubaneswar	Successful and leading farmer	Mr. Harihara Pradhan	Odisha Lift Irrigation System	50th Golden Jubilee Award
	Successful and leading farmer	Mr. Harihara Pradhan	OUAT, Bhubaneswar	Foundation Day
	Progressive Farmer	Mr. Harihara Pradhan	Govt. of Odisha	Krusha Odisha
ICAR-NRRI, Cuttack	Innovative Farmer Award	Mrs. Pushpita Samal	ICAR-NRRI, Cuttack	Honoured during NRRI Foundation day and Dhandiwas on 23 April, 2022
	Innovative Women Farmer Award	Mrs. Lilipta Behera	ICAR-NRRI, Cuttack	Honoured during International Women's day celebration during 10 March, 2023





## 7 MEDIA COVERAGE

The activities of the FFP centres, which were published in different prints and electronic media at local and national level, have been presented as under.

### 1) OUAT, Bhubaneswar



### 11) ICAR-CIFA, Bhubaneswar

**Padmashree Bata krushna Sahoo inaugurates Aqua Chaupal**

Sarakana, Khurda, (TSR) Aqua Chaupal, developed by ICAR-Central Institute of Freshwater Aquaculture, for promoting farmer to farmer learning, was inaugurated today by Padmashree Batakrushna Sahoo at Sarakana. Aqua Chaupal is a place where fish farmers can sit together and discuss fishery related issues to improve decision making ability and develop interpersonal skills amongst them. The Chaupal located close to the Sarakana fish farm will serve as a platform and would attract potential fish farmers to gather and discuss about the issues faced by them in fish farming practices. The Institute has conceptualized Aquaculture Field School, where a local farmer trains and educates a group of 25 fish farmers. It had established the first Field School at Sarakana at the farm of Sri Sahoo, a CIFA trained fish farmer cum entrepreneur long way in strengthening extension and advisory services. Farmers and rural youth would be benefited by sharing experiences at the Chaupal with SK Saha, with a view to source of inspiration for many. Regular sessions of interaction with the farmers at the Chaupal would facilitate trouble shooting of problems related to aquaculture practices. A Farmer Scientist Interface session was organised to address the problems faced by fish farmers in practicing composite carp culture. Around 120 farmers and farm women attended the session. Dr. GS Saha, Dr. HK De, Dr. SK Saha, Principal Scientists of ICAR-CIFA addressed production related queries and responded to questions. Ms. DP Pathy, vice-chancellor of ICAR-CIFA, Bhubaneswar, thanked and motivated the farmers to maintain active contact with the scientists of ICAR-CIFA for the next 50 years. 20/07/2022

Aquaculture Field School West Bengal and Tamil Nadu. The Chaupal developed under the Farmer FIRST project, being inaugurated at Sarakana, Khurda.

**Aqua Chaupal for fish farming issues**

ARINDAM GANGULY, OP

**Khurda, July 29:** Aqua Chaupal, developed by ICAR Central Institute of Freshwater Aquaculture (CIFA), for promoting farmer to farmer learning, was inaugurated Friday by Padma Shri Batakrushna Sahoo at Sarakana in Khurda. A farmer-scientist interface session was organised to address the problems faced by fish farmers in practicing composite carp culture. Around 120 farmers and farm women attended the programme. Principal Scientists of ICAR-CIFA GS Saha, HK De and SK Sahoo addressed production related queries and responded to questions. Aqua Chaupal is a place where fish farmers can sit together and discuss fishery related issues to improve decision making ability and develop interpersonal skills among them.

**Padma Shri Batakrushna Sahoo Inaugurates Aqua Chaupal**

20th July 2022, Sarakana, Khurda

Aqua Chaupal, developed by ICAR Central Institute of Freshwater Aquaculture, Bhubaneswar under Farmer FIRST Project, for promoting farmer to farmer learning, was inaugurated today by Padma Shri Batakrushna Sahoo at Sarakana.

Aqua Chaupal is a place where fish farmers can sit together and discuss fishery related issues to improve decision making ability and develop interpersonal skills among them. Farmers and rural youth would be benefited by sharing experiences with SK Saha, a local fish farmer and source of inspiration for many.

A Farmer Scientist Interface session was also organized to address the problems faced by fish farmers in practicing composite carp culture. Around 120 farmers and farm women attended the program. (Source: ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar)









IV) ICAR-IIWM, Bhubaneswar

## ସରିଲା ମହିଳା କୃଷକ ପ୍ରଶିକ୍ଷଣ ଶିବିର

ସାହାରପଡ଼ା, ୩୧।୧୧(ଆପ୍): ସାହାରପଡ଼ା ବ୍ଲକ ମଲହାରପଡ଼ା ପଞ୍ଚାୟତ ଅଧୀନ ଖୁଣ୍ଟାପିଙ୍ଗୁ ଓ ଜାମୁଦାଠାରେ ଚାଲିଥିବା ଚିନିପିଆ ମହିଳା କୃଷକ ପ୍ରଶିକ୍ଷଣ ଶିବିର ଉଦ୍‌ଘାଟନ ହୋଇଛି । ପ୍ରଥମେ ଖୁଣ୍ଟାପିଙ୍ଗୁ ଗାଁରେ ମହିଳାଙ୍କୁ ଦୁଇ ଦିନ ପ୍ରଶିକ୍ଷଣ ଦିଆଯାଇଥିଲା । ଏହାପରେ ଜାମୁଦାଠା ଗାଁରେ ମହିଳାଙ୍କୁ ପ୍ରଶିକ୍ଷଣ ଦିଆଯାଇଛି । ଭାରତୀୟ କୃଷି ଅନୁବନ୍ଧନ ପରିଷଦ ଅନ୍ତର୍ଗତ ଭାରତୀୟ ଚଳ ପ୍ରବନ୍ଧନ ସଂସ୍ଥାନ ତରଫରୁ ଏହି ଚାଲିମ ଦିଆଯାଇଛି । ପାର୍ମ୍ୟତା ଫାଷ୍ଟ ଟ୍ରୋଜେକ୍ଟ ମଧ୍ୟରେ ଅନୁଷ୍ଠିତ ଏହି କାର୍ଯ୍ୟକ୍ରମରେ ଶୀର୍ଷକ ଥିଲା 'କୃଷିରେ ଉଦ୍ୟୋଗ ଦ୍ୱାରା ମହିଳା କୃଷକ ସଶକ୍ତିକରଣ' ।



କାର୍ଯ୍ୟକ୍ରମରେ ମହିଳା ଚାଷୀମାନଙ୍କୁ ମତାମତରେ ଛଡ଼ ମଞ୍ଚି, ପରିସ୍ଥିତି, ଭୂମି ବେତ୍ତ ଓ ମିଠାମତା ମଞ୍ଚି ଓ ପୂର୍ଣ୍ଣମୁଖା ମଞ୍ଚି ବିବରଣ କରାଯାଇଥିଲା । ସଂସ୍କାର ବୈଜ୍ଞାନିକ ଓ ଆମେତା ଠାକୁର, ଡ଼ ମଧୁମିତା ଦାଶ, ଡ଼ ଶରତକନ୍ଦ ମହାନ୍ତି, ଡ଼ ରଜନୀ ମହାନ୍ତି, ଡ଼ ପ୍ରଦିପା ସାହୁ, ଡ଼ ଅନିତା ନାୟକ ଓ ଡ଼ ଭଗେଶ ଚେନା ଉଦ୍‌ଘାଟନା ଦେବା ସହ ଉତ୍ତର କୃଷି ପ୍ରଫେସର ବିଷୟରେ ଅବଗତ କରିଥିଲେ । ସଂସ୍କାନ ବୈଜ୍ଞାନିକ ଡ଼ ଦେବଦତ୍ତ ସେଠା କାର୍ଯ୍ୟକ୍ରମ ସଂଯୋଜନା କରିଥିଲେ । ମୋରାଇ ଆର୍ ଡିଡିଓ କନଫରେନ୍ସ ଏବଂ ସେସିଆଲ ମିଡିଆର ଦ୍ୱାରାହାର ଦୂର ଚାଷୀଙ୍କ ସମସ୍ୟାର ସମାଧାନ ଉପରେ ସ୍ପଷ୍ଟତା ଦେଇଥିଲେ । ପ୍ରଶିକ୍ଷକ ହେଉଛନ୍ତି ମହାନ୍ତି, ରଞ୍ଜିତା ମହାନ୍ତି, ମିଳ ମହାନ୍ତି ଇତ୍ୟାଦି ଚାଷୀ ଓ ଡ଼ିଆ ଶକ୍ତ ତିଆରି ପଦ୍ଧତି କରି ଦେଖାଇଥିଲେ । ଏସିଆରଏସ୍ ଉଚ୍ଚା ଆନସିତା ସାହୁ, ଶିବପ୍ରସାଦ ମହାନ୍ତି କାର୍ଯ୍ୟକ୍ରମରେ ସହଯୋଗ କରିଥିଲେ ।



ପ୍ରାରମ୍ଭ: ସାହାରପଡ଼ା ବ୍ଲକ ମଲହାରପଡ଼ା, ଜାମୁଦାଠା ଓ ଖୁଣ୍ଟାପିଙ୍ଗୁ ଗ୍ରାମରେ ଚାଷୀଙ୍କୁ ଚିନିପିଆ ମଞ୍ଚି ଓ ଉତ୍ତମ ବଦଳ କରାଯାଇଛି । ଭାରତୀୟ ଚଳ ପ୍ରବନ୍ଧନ ସଂସ୍ଥାନ ତରଫରୁ ପାର୍ମ୍ୟତା ଫାଷ୍ଟ ପ୍ରୋଜେକ୍ଟ ମଧ୍ୟରେ ୧୫୦ରୁ ଉର୍ଦ୍ଧ ଚାଷୀଙ୍କୁ

## ପରିବା ମଞ୍ଚି ଓ ଔଷଧ ବଣ୍ଟନ

ସାହାରପଡ଼ା, ୧୧।୧୧(ଆପ୍): ସାହାରପଡ଼ା ବ୍ଲକ ମଲହାରପଡ଼ା, ଜାମୁଦାଠା ଓ ଖୁଣ୍ଟାପିଙ୍ଗୁ ଗ୍ରାମରେ ପରିବା ମଞ୍ଚି ଓ ଔଷଧ ବଣ୍ଟନ କରାଯାଇଛି । ଭାରତୀୟ ଜଳ ପ୍ରବନ୍ଧନ ସଂସ୍ଥାନ ଭୁବନେଶ୍ୱର ତରଫରୁ ପାର୍ମ୍ୟତା ଫାଷ୍ଟ ପ୍ରୋଜେକ୍ଟ ମାଧ୍ୟମରେ ୧୫୦ରୁ ଅଧିକ ଚାଷୀଙ୍କୁ ମାଗଣାରେ ପରିବା ମଞ୍ଚି ଓ ଔଷଧ ଯୋଗାଇ ଦିଆଯାଇଛି । କାର୍ଯ୍ୟକ୍ରମରେ ସଂସ୍ଥାନର ବୈଜ୍ଞାନିକ ଡ଼ ଦେବଦତ୍ତ ସେଠି, ଏସଆରଏସ୍ ଇଶା ଅନସିତା ସାହୁ, କ୍ଷେତ୍ର ସହଯୋଗୀ ଶିବପ୍ରସାଦ ମହାନ୍ତି ଓ ତପନ କୁମାର ସେଠା ପ୍ରମୁଖ ଉପସ୍ଥିତ ରହି ବଣ୍ଟନରେ ସହାୟତା କରିଥିଲେ ।

## କୃଷି ଜଳ ପରିଚାଳନା ଓ ଫସଲ ଯୋଜନା ସମ୍ପର୍କିତ ପ୍ରଶିକ୍ଷଣ ଶିବିର



ସାହାରପଡ଼ା, ୩୧।୧୧(ଆପ୍): ସାହାରପଡ଼ା ବ୍ଲକ ପରିଚାଳନା ଏବଂ ଫସଲ ଯୋଜନା ସମ୍ପର୍କିତ କୃଷକ ପ୍ରଶିକ୍ଷଣ ଶିବିର ଅନୁଷ୍ଠିତ ହୋଇଯାଇଛି । ଭାରତୀୟ କୃଷି ଅନୁବନ୍ଧନ ପରିଷଦ ଅନ୍ତର୍ଗତ ଭାରତୀୟ ଚଳ ପ୍ରବନ୍ଧନ ସଂସ୍ଥାନ ତରଫରୁ ଅନୁଷ୍ଠିତ ଏହି କାର୍ଯ୍ୟକ୍ରମରେ ୧୦୦ ଜଣ ମହିଳା କୃଷକ ଅଂଶଗ୍ରହଣ କରିଥିଲେ । ୧.୬ଟି ସଭା ସହାୟକ ଚୋଷାର ମହିଳା କୃଷକଙ୍କୁ ଖଟିତ ଉତ୍ତର କୃଷି ବିଧି କରଣ ପାଇଁ ପରିଚାଳନା, ସଖ୍ୟା ଜାତୀୟ ଏବଂ ଚାଲି ଜାତୀୟ ଫସଲ ଚାଷ ସମ୍ପର୍କରେ ତାଲିମ ଦିଆଯାଇଛି । ଶ୍ରୀ ପଦ୍ମବିରୋଧ ଧନ ଚାଷ ଚଞ୍ଚଳ ବୈଜ୍ଞାନିକ ପଦ୍ମବିରୋଧ ମଞ୍ଚ ଚାଷ ବିଷୟରେ ଚାଷୀଙ୍କୁ ଅବଗତ କରାଯାଇଥିଲା । ପ୍ରତ୍ୟେକ ସଭା ସହାୟକ ଚୋଷାର ସଂସ୍ଥାନରେ କେଉଁ ଚାଷ କରି ଭାରତୀୟ ଚଳ ପରିଷଦ ସେ କେଉଁ ବିଷୟ ନେଇଥିଲେ । ସଂସ୍ଥାନର ବୈଜ୍ଞାନିକ ଡ଼ ପାର୍ମ୍ୟତା ଅଧିକାରୀ ମାଲବିକା ଏବଂ ମୁଖିକର ସମସ୍ୟାର ସେ ଡ଼ ପ୍ରବନ୍ଧନ ବିଷୟରେ ଦୁଇଭାଷୀରେ ବୈଜ୍ଞାନିକ ଡ଼ ଦେବଦତ୍ତ ସେଠା ପ୍ରଶ୍ନ ଉତ୍ତର ଦେବା ଏବଂ କର୍ମ ଆଧାର ଚାଷ ଉପରେ ବିବରଣ ଦେଇଥିଲେ । କେନ୍ଦ୍ରରେ ଚୋଷାର ମହିଳା କୃଷକଙ୍କୁ ଖଟିତ ଉତ୍ତର କୃଷି ବିଧି କରଣ ପାଇଁ ପରିଚାଳନା ଚାଷ ନୀତି ଉପରେ ପ୍ରସ୍ତୁତ କୃଷି ସମ୍ପର୍କରେ ଅବଗତ କରାଯାଇଥିଲା । କାର୍ଯ୍ୟକ୍ରମ ପରିଚାଳନାରେ ଏସିଆରଏସ୍ ଉଚ୍ଚା ଆନସିତା ସାହୁ ଏବଂ ଫିଲ୍ଡ ଅଫିସର ଶିବ ପ୍ରସାଦ ମହାନ୍ତି ସହଯୋଗ କରିଥିଲେ ।





हर कदम, हर डगर  
किसानों का हमसफर  
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**ICAR-Agricultural Technology Application Research Institute Kolkata**  
**भूमि विहार काम्प्लेक्स, ब्लॉक-जी.बी., सेक्टर-3, साल्ट लेक, कोलकाता - 700 097**  
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