ICAR-CENTRAL INSTITUTE OF FRESHWATER AQUACULTURE

(An ISO 9001:2015 Certified Institute)

KAUSALYAGANGA, BHUBANESWAR-751002, ODISHA, INDIA

TSP/STC work accomplishment

1. Introduction giving base line information, funding etc.

TSP/STC programme of ICAR-CIFA was operated in 4 aspirational districts, i.e. Koraput, Nabarangapur, Gajapati of Odisha and West Singhbhum of Jharkhand during 2019-2020. The main objective of the programme was to enhance the income of the adopted family through various technological interventions which ultimately lead to sustainable livelihood. Keeping in view the mandate of ICAR-CIFA the main focus was to develop the aquaculture based technological empowerment. While implementing the programme special emphasis was given to the women farmers mainly through Self Help Groups.

West Singbhum district of Jharkhand is one of the poorest districts in the country with high levels of poverty and is dominated by tribal population. 67% of total population belongs to different tribes. 85.48% of its people live in the villages. It has 21 % of its area under forest cover. Employment opportunities are limited in the district with 44% of the people being engaged in Agricultural labour. The average landholding is of about 1-hectare majority is of upland.

Three districts Odisha i.e. Koraput, Nabarangapur and Gajapati are among the 250 most backward districts, categorized by Ministry of Panchayat Raj in 2006. Koraput is an Adivasi district, known for high concentration of Adivasi communities (tribes). As many as 51 tribes are found in undivided Koraput district (includes Nabarangapur and Malkanagiri). The Koraput district comprise of hilly areas where as Nabarangapur is having more plain area. The district Gajapati is having 55.79 % of tribal population as per 2011 census. All the three districts' economy mainly depends on rainfed agriculture.

2. Issues and challenges

All the 4 district belongs to most backyard category where livelihood option is limited. Though fishery played an important role next to agriculture in state of Jharkhand nearly 70% of water bodies is not brought under scientific aquaculture. The major impediments of development of fisheries in the state are disorganized extension support due to lack of requisite extension personnel at grass root level, dilapidated existing aqua resources, weak infrastructure and inadequate / inappropriate policy support, tenural right issue, inequalities, lack of scientific technology and poor infrastructure and market linkages.

The population of the Nabarangpur district is aound15 lakh with one of the lowest per capita income in the state (1200/- per month) whereas the state average is Rs.5000/- & national average Rs.7000/-. A survey shows that the minimum food expenditure of Rs. 400 per month with very low or no economic activity at all. The district is endowed with varied water resources, which could be exploited economically and sustainably to provide livelihoods security as well as economic security to the tribal community. The district has a total water area- 4982 ha out of which private pond 530 ha, GP pond 672 ha, revenue pond 530 ha. As per the data of District Fisheries Officer spawn stocking in 2016-17 was 2.05 Cr and fingerling stocking for 2016-17 is 28 lakhs. The total Fish Production in 2016-17 was about 550t. The district is in a developmental stage, with regard to inland fisheries is concerned. Many riverine systems and water bodies are a boon for accelerating its production capacity in fisheries. As the district has

no hatcheries, it limits seed rearing and Fisheries Department is spending about 30 lakhs in seed procurement.

In Koraput the aquaculture is in very poor state. In Jeypur district because of State Fisheries intervention small scale aquaculture exists. In other blocks like Koraput, Boriguma, Kotapat and Nandapur where CIFA undertook the work, aquaculture is somewhat new introduction. Under different schemes like MGNREGS, MIDH (Mission for Integrated Development of Horticulture), RKVY many small to medium size ponds have been created. So, aquaculture could play key role to utilize these water bodies to generate substantial revenue. It was visualized that since both water resource and human resources were present sufficiently, the aquaculture could prove to be main weapon to fight hunger and poverty paving the road to development.

Thus, different aquaculture technologies were introduced to all the 4 districts through demonstration, training and timely supply of critical inputs.

3. State wise activities/initiatives

a. Initiatives and Linkages with Govt. Depts., SHGs, NGOs:

ICAR-CIFA, Bhubaneswar under its TSP Programme had adopted four Tribal Aspirational Districts, such as Koraput, Gajapati and Nabrangpur of Odisha and West Singhbhum of Jharkhand for demonstration of aquaculture technologies to the selected tribal farmers. In each district ICAR-CIFA worked in collaboration with State Fisheries, KVKs and reputed NGOs of the respective locality, details of which are as follow:

Odisha:

Gajapati district

ICAR-Central Institute of Freshwater Aquaculture adopted the district under STC, GoI and has taken up scientific interventions in Gajapati aspirational district of Odisha. The programme is being implemented in collaboration and coordination with other govt. agencies like State Fisheries Department, Govt. of Odisha, Soura Development Agency (SDA), Govt. of Odisha; Lanjia Soura Development Agency (LSDA), Odisha PVTG Empowerment & Livelihood Improvement Programme (OPELIP), Govt. of Odisha; KVK (OUAT); and other line departments of Govt. of Odisha. The target groups, mostly covering PVTG tribal women self-help groups were identified with the help of above agencies. Around 81 SHG groups (450 beneficiaries) from 5 blocks viz. Mohana, R. Udayagiri, Gumma, Nuagada and Rayagada were benefited from this programme.

b. Details of Technology disseminated:

Integrated fish farming

Integrated fish farming is a better approach for sustainable livelihood. Integrated farming was disseminated to the farmers through training and demontration. A hands-on-training on "Integrated Aquaculture based Livelihood Development" was conducted at Gajapati district of Odisha. Total 134 participants were present from 16 SHGs. The farmers were trained on Fish-Duckery, Fish-Poultry, Horticulture, Honey bee farming etc.

Farm made Feed:

Preparation of farm made feed by using locally available fish feed ingredients like rice bran, maize, soya meal, til oil cake, mahua oil cake were demostrated to the farmers at SDA Campus, Chandragiri, Gajapati. Around 70 tribal SHG members attended the programme.

Scientific Honey bee farming:

Scientific Honey bee farming was disseminated to the farmers through training and demontration on "Scientific Honey bee farming in an integrated approach" which was conducted at Bhubani Village, Gumma, Gajapati. Around 60 primitive vulnerable tribal groups (PVTG), women tribal beneficiaries from 10 Women shelf-help groups (WSHGs) attended the programme. The tribal WSHG members were demonstrated by Honey bee expert Mr. Ghanashyam Parida, on various aspects of "Honey bee farming, their maintenance, multiplication, care and Honey harvesting. Installation of Honey bee box was demonstrated at village sites.

Input distribution:

Various aquaculture based integrated farming inputs were distributed to the beneficiaries of women self-help groups from 5 different blocks viz. Gumma, R. Udayagiri, Mohana, Rayagada, Nuagada during the year 2019-20 as given below. Around 540 beneficiaries from 81 tribal women self-help groups were benefitted.

Sl. No.	Details of items distributed	Total
1.	Fish feed: Floating feed 2-3mm, 28% protein	1500kg
2.	Ground nut oil cake	375 kg
3.	Poultry feed	3000kg
4.	Lime (CaO) for water treatment	1500kg
5.	Ducklings, 28 days, Vaccinated	1500 nos
6.	Chicks (Vanaraja, 28 days old, vaccinated	3000 nos
7.	Fish Fingerlings/ yearlings 10-50 gm size, for 14 acre ponds	285 kg 12,000 nos

8.	Mushroom seed with accessories, 2 set each	60 nos
9.	Drag net, 100 ftx 20ft, 1 inch mesh size	6 nos
10.	Cast net	20 nos
11.	Horticulture crops (Guava-300, Mango-300, Lichi-100)	700 nos
12.	Portable Pelletizer : Electrically& manually operated with 2 HP motor	2 nos
13.	Portable kitchen grinder: Electrically & manually operated with 2 HP motor	2 nos
14.	Aluminium Handi, 100-150 litres capacity	120 nos
15.	Bee box (wooden) with Honey bees, accessories including smoker	2 set
16.	Honey extractor system,	1 no
17.	3 HP diesel pump with accessories	10 nos
18.	Solar Lantern 3 Watt LED, 7Ah Battery	80 nos

Training programme organised

Seven training and demonstration programmes were conducted at Gajapati for tribal women SHG groups during the period 2019-20 in collaboration with State Fisheries Dept. Gajapati; Soura Development Agency, Chandragiri; Krishi Vigyan Kendra, R. Udayagiri; Odisha PVTG Empowerment & Livelihood Improvement Programme (OPELIP), Gumma; Lanjia Soura Development Agency (LSDA), Gajapati; Janakalyan Pratisthana, Paralakhemundi. The programmes are listed below.

Details of trainings undertaken	**Venue**	**Date**	**No of SHG/ Beneficiaries**
Review workshop on "Integrated Aquaculture based Livelihood Development"	SDA, Chandragiri	13.06.2019	25/150
Tribal Farmers skill development, training and demonstration programme on "Aquaculture based Integrated Livelihood Development"	Gumma Block, Gajapati	13.11.2019	14 / 120
Training and Demonstration on Fish feed preparation	SDA, Chandragiri	14.01.2020	5/ 50 nos
Scientific Honey bee farming in an integrated approach	Bhubani Village, Gumma	17.01.2020	10/ 60 PVTG
Aquaculture based Integrated Livelihood Development in Gajapti, Odisha	Kujasing, Gumma	18.01.2020	11 / 80 PVTG
Aquaculture based Integrated Livelihood Development in Gajapati, Odisha	KVK (OUAT), R. Udayagiri	14-15.02.2020	22/ 120 PVTG
Training, Demonstration & Distribution of Inputs for Aquaculture Based Integrated Farming in Gajapati, Odisha	Ajayagada, Gumma	7-8.03.2020	19/ 110
Total:			87 WSHGs/ 580 Beneficiaries

Activities photos

13.06.2019

13.11.2019

13.11.2019

13.11.2019

14.01.2020

17.01.2020

18.01.2020

14-15.02.2020

7-8.03.2020

7-8.03.2020

Koraput district

The institute in collaboration with State Fisheries Department, Odisha worked in Jeypur block where women SHGs were encouraged to undertook aquaculture in lease in Panchayat ponds. In collaboration with 'PRAGATI', one leading NGO of the district undertook TSP activities in Koraput, Boriguma and Kotpat block where 136 ponds covering about 20 ha water area were brought under scientific aquaculture. Total 240 farmers were benefitted in the district.

b. Details of Technology disseminated:

FRP Carp Hatchery:
Four FRP Carp hatcheries each consisted of one breeding pool, two hatching pool and one egg collection chamber with all accessories were installed one each at Dayanidhiguda, Boriguma, Jhilimiliguda and Kotpad of Koraput district to create infrastructure for carp breeding and seed production. Each hatchery is provided with overhead tanks of 2000l capacity and water pump.

Induced breeding:
On farm trial of Induced breeding of rohu through Ovatide injection was undertaken at Dayanidhiguda. Brooder selection, injection, egg collection, Hatchery operation and spawn collection was demonstration to the farmers. one lakh spawn was recovered.

Portable carp hatchery at Dayanidhiguda

Demonstration of hormone injection

Release of eggs in circular hatchery Collection of spawns from hatchery

Nursery Management:
Following successful breeding of carp next step the nursery management to produce fry and fingerling was demonstrated in Koraput. Farmers were demonstrated the whole process starting from pond preparation including application of bleaching powder, lime and fertilizer to spawn stocking and water and feed management. Over 18 nursery ponds were prepared for stocking of spawn at Kotpad and Borigumma block of Koraput district of Odisha during 28-29th June, 2019.. Around 50 beneficiaries attended the programme.

Jayanti Rohu spawn were transported from ICAR-CIFA to Boriguma block, Koraput and stocked in 4 ponds. Primarily, water quality parameters like alkalinity and pH has been monitored. Farmers were demonstrated the whole process starting from pond preparation to spawn stocking and water and feed management.

Composite fish culture:

Scientific Composite fish culture were demontrated in adopted ponds of the beneficiaries in all districts. Benefit of composite fish culture was explained to the farmers. IMC, grass carp, and minor carp fingerlings were stocked in all districts. Some ponds stocked during 2018-19 were harvested.

Input Distribution

Sl. No.	Details of items distributed	Total
1.	Fish feed: Floating feed 2-3mm, 28% protein	7,500 kg
2.	Ground nut oil cake	1000 kg
3.	Bleaching powder	1000 kg
4.	Lime (CaO) for water treatment	350kg
5.	FRP Carp hatchery installed	4 nos
6.	Jayanti Rohu spawns	2 lakh
7.	Carp Fingerlings for stoking in 136 ponds	653 kg
8.	Aluminium handi (100-150 litres capacity)	100 nos
9.	Drag net, 120 ftx 18ft, 1 inch mesh size	8 nos
10.	Cast net	20 nos
11.	Happas	10 nos
12.	3 HP disel water pump	3 nos
13.	Solar pump of 0.5 HP	10 nos
14.	Solar pump of 1HP	1nos

Input distribution to the beneficiaries

Training/Demonstration programme organised

Details of trainings undertaken	Venue	Date	No of Tribal Beneficiaries
Awareness program on Carp seed production, nursery preparation and Ornamental fish culture	Dayanidhiguda, Koraput	7 June 2019	61
Training cum demonstration of nursery preparation for fish spawn rearing	Kotpad and Borigumma	28-29 June, 2019	50
Exposure-Cum-Training on Freshwater Aquaculture for tribal farmers (STC scheme)	ICAR-CIFA, Bhubaneswar	8-10 July, 2019	32
6th National Training Programme on "Breeding and seed production of carp in FRP Hatchery"	ICAR-CIFA, Bhubaneswar	6-10 August, 2019	12
Training on Ornamental fish farming	Dayanidhiguda, Koraput	26-27 February,2020	31

Tribal Farmers along with faculties during "Exposure-Cum-Training on Freshwater Aquaculture for tribal farmers (STC scheme)"

6th National Training Programme on "Breeding and seed production of carp in FRP Hatchery" during 6-10 August, 2019 at ICAR-CIFA, Bhubaneswar

Nabarangapur district

The work at Nabrangapur was under taken in collaboration with State Fisheries department. Three clusters viz., Kusumjhari, Kapur and Chandahandi were identified for aquaculture interventions with following beneficiaries.

Sl.N0.	**Name of SHGs/PFCS**	**No of Member**
1.	Dandaruna SHG , Karchamala, Kosagumuda	26
2.	Kapur PFCS. Khatiguda, Nabarangpur	100
3.	Kusumjhar PFCS , Nabarangpur	100
4.	Chandahandi SHG, Chandahandi, Nabarangpur	56
Total		**282**

b. Details of Technology disseminated:

Establishment of Quality Germplasm in Nabarangpur District:

For developing any aquaculture practices and carrying out any hatchery operation, good quality brood stock (Healthy, devoid of any deformities and inbreeding depression and active) is a pre-requisite. During the primary sampling, it was found that majority of brood stock quality was degraded. For this quality brood stocks were provided to the prospective fish farmers of the district by ICAR-CIFA. The major varieties supplied were Improved Catla, Jayanti Rohu, Mrigal, Pengba sp,Grass carp, *Puntius gonionatus* and *Labeo fimbriatus*.

FRP Carp hatchery:
Three FRP Carp hatcheries were installed one each at Kusumjhari, Kapur Dam and Umerkote of Nabrangpur district to create infrastructure for carp breeding and seed production under the guidance of scientists from ICAR-CIFA.

Improved quality Broodstock supplied by ICAR-CIFA

FRP Carp Hatchery

Input distribution:

Various aquaculture based integrated farming inputs were distributed to the 282 beneficiaries of tribal women self-help groups of Kosagumuda block, Umerkote block, Nandahandi block and Dabugaon block.

Sl. No.	Details of items distributed	Total
1.	Floating Fish feed (2-3mm, 28% protein)	10,800kg
2.	CIFABROOD^{TM} feed	4000kg
3.	Plastic crate	50nos
4.	Aluminium handi	50 nos
5.	3 HP Disel pump	5 nos
6.	Potable kitchen pelletizer	5 nos
7.	Jayanti Rohu spawn, fish fry (major and minor carp), Advanced fry(minor carp)	4.2 lakh
8.	Drag nets	8 nos
9.	Happas	10 nos
10.	Cast net	20 nos
11.	Fry nets	10 nos
12.	Potable kitchen grinder	5nos
13.	FRP Carp Hatchery	3nos

Training/ Demonstration programme organised

Details of trainings undertaken	Venue	Date	No of Tribal Beneficiaries
Training programmes on "Aquaculture based value chain"	Nabarangpur	2 November,2019	66
Training programmeson Scientific Aquaculture based livelihood development	Chandahandi, Umerkote and Nabarangpur	28 October-3 November, 2019	90
Training programme on "Scientific Aquaculture practices"	ICAR-CIFA, Bhubaneswar	3-5 Feb,2020	10

Jharkhand

West Singhbhum district

The institute in collaboration with PRADAN (a leading NGO) and KVK, West Singhbhum had undertaken TSP activities in selected blocks of West Singhbhum district, the detail of which given below.

SI No	Village	Sub district/ Block	Number of beneficiaries
1	Lojara kala	Chakradharpur	64
2	Koituika		
3	Baghmara		
4	Gopinathpur		
5	Geliyalor		
6	Rolodih		
7	Udaypur	Sonua	63
8	Segesai		
9	Amadia	Hatgamania	62
10	Kendposi		
11	Badalisiya	Tonto	82
12	Durirta		
13	Talaburu		
Total:			**271**

b. Details of Technologies disseminated

FRP Carp Hatchery

Two FRP Carp hatcheries were installed one each at Talabaru and Chakradharpur of West Singhbum district to create infrastructure for carp breeding and seed production under the guidance of scientists from ICAR-CIFA.

Grow-out Pond Management

Demonstration of stocking of 2 lakh fry of 15-25mm size including catla, rohu, mrigal, silver barb, olive barb, fringed lipped barb, and pengba was done in farmers pond of beneficiaries of Chaibasa and Chakradharpur. Primarily, water quality parameters like alkalinity and pH has been monitored. Farmers were demonstrated the whole process starting from pond preparation to fry stocking and water and feed management.

Input distribution:

Various aquaculture based integrated farming inputs were distributed to the 272 beneficiaries of Gopinathpur, Chakradharpur and Talaburu villages of W. Singhbhum.

Sl. No.	Details of items distributed	Total
1.	Cast Net	10 Nos.
2.	Drag Net (2" mesh)	04 Nos.
3.	Portable Kitchen Pelletizer	03 Nos.
4.	Portable Kitchen Grinder	03 Nos.
5.	2 HP Electric Motor	01 Nos.
6.	1 HP Pump	02 Nos.
7.	2 HP Pump	02 Nos.
8.	Fish Seed (Fry Size)	2 lakhs
9.	Lime	148 kg
10.	DORB	1000 kg
11.	GNOC	1000 kg
12.	Floating feed	10,000Kg
13.	FRP Carp Hatchery	2nos
14.	CIFAX	50 Litres
15.	Plastic crates	40 nos
16.	Weighing balance	10nos
17.	$KMno_4$	20 Kg

Training/ Demonstration programme organised

Details of trainings undertaken	Venue	Date	No of Tribal Beneficiaries
3 days exposure-cum training on freshwater aquaculture for tribal farmers	ICAR-CIFA,Bhubaneswar	8-10 July,2019	10
Training programme on "Breeding and seed production of carps in FRP hatchery"	ICAR-CIFA,Bhubaneswar	8-10 Aug 2019	4
Demonstration of advanced fry stocking and pond management	Gopinathpur and Talaburu	21-23 October 2019	45
Awareness programme on Health management	Chakradharpur and Chaibasa	7 Feb,2020	62
Training programme on "Scientific Aquaculture practices"	ICAR-CIFA, Bhubaneswar	3-5 Feb,2020	10
Training programme on Farm made feed preparation and pond management	Panchayat office Gopinathpur, Chakradharpur block	5th March 2020	100

Impact analysis

- During the year 2019-2020 more than 1000 farmers were directly involved in the programme. They were empowered in different aquaculture technology through training, demonstration, farm visit and close interactions. Result is creation of skilled human resource.
- Scientific aquaculture practice was successfully introduced to the area creating better livelihood option.
- In West Singhbhum, Koraput and Nabarangapur, FRP hatcheries were installed for carp breeding programme. By introducing breeding and seed production, quality and cost-effective seed availability was ensured which was the main constraint for aquaculture development.
- The trainings, both classroom and on field, by CIFA, boosted the farmers' confidence and aspiration towards a bigger vision of high profits from fishery. Elaborate training and repeated visit of scientist brought confidence among farmers and created leadership, especially among women.
- The programme not only enhanced the economic status of the farmers but also support the nutritional requirement.
- While working in these remote tribal areas ICAR-CIFA has established a strong linkage with State fisheries, KVKs and NGOs.