

Doubling Farmers' Income

through Carp Seed Rearing

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Farmer FIRST Programme, an innovative extension approach, focuses on enriching knowledge and interpreting technologies in the farmers' condition. ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar has implemented this project during 2016-19. According to the authors view doubling of farmers' income through carp seed rearing is possible and the project has significantly contributed towards livelihood improvement of the beneficiaries.

Keywords: Carp seed rearing, Doubling farmers' income, Farmer FIRST Programme

FARMER FIRST Programme is an approach which focuses on enriching knowledge and integrating technologies in the farmers' conditions and to enhance farmer-scientist interface. Emphasis is given on farmer's farm, innovations, resources, science and technology. Small holders, landless and farm women are specially addressed through technology integration modules. Strong partnership with farmer for developing location specific, demand driven farmer friendly technology option is the guiding principle.

The project has covered 4 villages in Khordha district i.e. Kantia

Talajahi, Kantia uparajahi, Jagannathpur (Block-Balianta) and Dorbanga (Block-Balipatna) involving more than 400 small and marginal farmers belonging to SC & ST categories and women. Modules on improved technologies on crop, horticulture, livestock and fishery are demonstrated. Skill training and technical backup are provided to the beneficiaries. The project was operated by ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar in 2016-19.

Integrated nutrient management in paddy, powdery mildew resistant variety of green gram var. TARM 1, photo insensitive variety of

cauliflower var. Fujiyama, bitter gourd var. VNR, backyard poultry farming var. Vanaraja, composite carp culture, minor carp farming etc. technologies are demonstrated in the adopted villages. Fish based integrated farming system was established in 3 adopted villages for increase in income of farm household through integration of different enterprises.

Component I: Enhancing Farmers-Scientist Interface

For enhanced capacity building regular farmers-scientist interfaces were conducted. Need based trainings, visits, workshops,

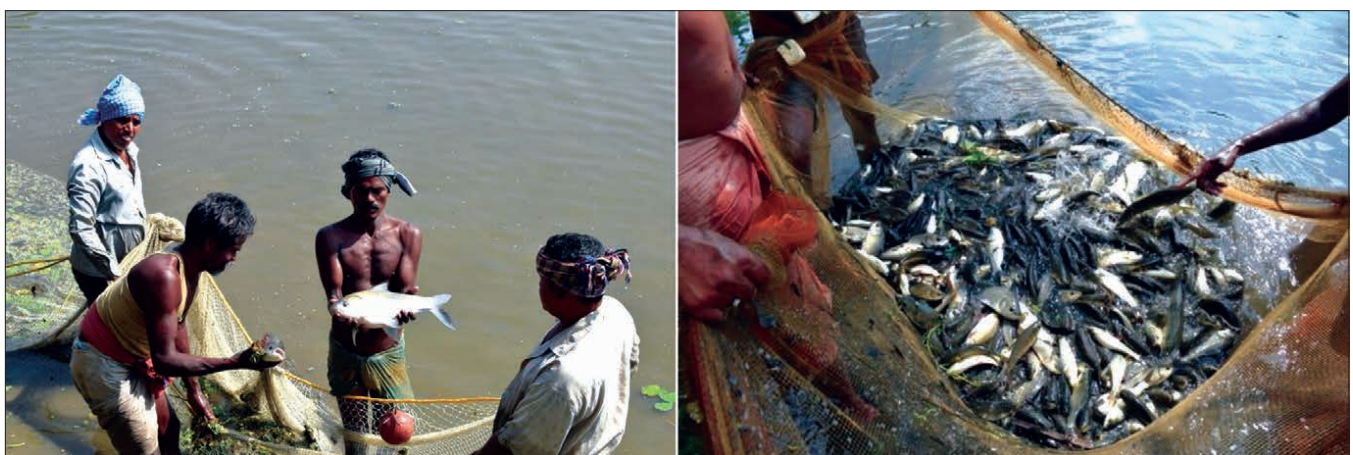


Fig. 1. Carp Seed rearing

Table 1. Technology assessment and module application 2018-19

Crop/Variety/Technology/Methodology	No. of Farmers	Area Covered (ha)	Yield before FFP (t/ha)	Yield after FFP (t/ha)
Integrated Nutrient Management in paddy	38	15.2	4.0	4.5
Green gram in Rice fallow	155	18.6	0.375	0.625
Improved variety of Bitter gourd var. VNR	20	2.5	-	30
Introduction of Cauliflower var. Fujiyama	10	1.2	15	20
Introduction of Bush type French bean var. Falguni	10	0.4	-	8
Backyard Poultry Strain (Kaveri/Vararaja)	150	1500 nos	-	3-3.5 kg body weight gain and 20-25 egg per month after 6-7 months maturity
Composite Carp Culture	280	5.33	1.6	3.0
Introduction of Minor carp in Backyard ponds	14	0.36	-	350 g after 6-7 months
Total	677			

interfaces, extension activities etc. were carried out at regular interval. Demonstrations of new technologies in the adopted villages were also carried out. In the year 2018-19 thirteen field days and five farmer-scientist interfaces were organized from which 414 and 191 farmers were benefitted respectively.

Component II: Technology Assemblage, Application and Feedback

Recommended technologies from various sources like ICAR-CIFA; OUAT, Bhubaneswar; Odisha State Seeds Corporation Limited; Central Poultry Development Organisation

etc. were demonstrated in the adopted villages as per suitability.

- i. Integrated Nutrient Management in paddy was demonstrated in 15.2 ha of land during 2018-19 *Kharif* season. Under INM, the following practices were carried out to reduce the use of chemical fertilizer.
 - Application of Zinc Sulphate @ 25 kg/ha and FYM @ 12.5 t/ha.
 - Green manuring with Dhaincha (25 kg seed/ha)
 - Seed treatment with fungicides e.g. Thiram 42% @ 3 g/kg seed
 - Demonstration of Cono weeder
 - Use of green manure and FYM

reduced the application of chemical fertilizer into half of the recommended dose.

- Leaf colour chart developed by ICAR-NRRI, Cuttack used for efficient nitrogen management in paddy
- ii. Green gram was demonstrated as rice fallow to utilize the available soil moisture after harvesting of rice. Before planting green gram seeds were inoculated with Rhizobium, Phosphobactor @ 250 gm each/10 kg of seed and Trichoderma @ 10 gm/10 kg of seed. Seed dressing was done with Gaucho (Imidacloprid) @ 1.5 ml/kg of seed. A powdery mildew resistant variety (TARM 1) was demonstrated which provides yield of 0.625 t/ha.
- iii. Composite carp culture was practiced in 6 community ponds having an area of 5.33 ha. Lime was applied on the basis of soil and water test. Supplementary feeding was given @ 2% of total biomass. Bigger and healthier fingerlings were stocked after proper acclimatization with the pond environment. Potassium permanganate was also applied as disinfectant to the fingerlings to protect them from different diseases. Fish health was checked through sampling at regular interval.
- iv. VNR variety of bitter gourd was also demonstrated in the villages and the highest yield of 30 t/ha was recorded.
- v. Photo insensitive variety of cauliflower (Fujiyama) was introduced for growing in off season. The cultivar gave an

Carp seed production for doubling farmer's income

Shri Gadadhar Pradhan (65) of village Giringo, District Khordha, a beneficiary of Farmer FIRST Programme was introduced to Carp seed rearing. The farmer was involved in different farming practices like cereal, horticulture, livestock and fisheries. He has holding size of 1 ha. The farmer also owns 3 cattle and 30 sheep. He has a pond of area 0.15 ha where he used to practice carp culture.

Shri Pradhan gets around 5 quintal of table fish production in one year from the pond (3.3 tonne/ha) which he dispose at ₹ 120/kg in the local market. After spending ₹ 24,700 for pond cleaning, fertilization, renovation and for procurement of raw materials like fish seed, feed, lime, labour etc., he earned ₹ 60,000. This gave him a profit of ₹ 35,000 in a year.

After receiving training and technical guidance from the project, he switched over to carp seed rearing in his pond in 2017-18. By adopting ICAR-CIFA technology package, the farmer was able to grow a good crop and harvested fingerlings in three and half months' time. He had stocked 7,00,000 carp spawn and was able to produce 2,40,000 carp fingerlings. He spent ₹ 28,000 for pond cleaning, liming, fertilization and for procurement of spawn, feed, labour, etc. Sale proceeds from carp seed was ₹ 84,000. After selling seed the pond was utilized for grow out culture for the rest of the season. He harvested 3 quintal of table fish with a monetary return of ₹ 36,000 without any further expenditure. From fish seed rearing as well as grow out culture he earn a profit of ₹ 75,000 which is 2.15 times higher than his previous enterprise.



Fig. 2. Enhancing Farmers-Scientist Interface: Workshop on farmers' feedback

average yield of 17.5 t/ha.

vi. Fish based Integrated Farming System with dairy, poultry, horticulture crops on the pond embankments have been established in Jagannathpur.

Increased access to advanced technologies and support provided by the project has enabled the farmers to adopt the improved practices.

Component III: Partnership and Institution Building

Under this project Self Help Group for schedule caste and landless women were mobilized for poultry farming. Training on technologies related to one day old chicks brooding, poultry feed and vaccinations were provided to the beneficiaries. Seven SHGs were involved from 3 villages for this intervention. Facilitated formation of Bhargabi Fish farmers Producers Company Ltd. in Balipatna block. This company was incorporated on 27.03.2019. Technical back up and training were provided to the shareholders of this FPO through the project.

Component IV: Content Mobilization

- *Website developed for the project:* Complete information including location, beneficiaries, villages adopted, intervention, photo gallery, publications, contact us etc. are there. Further, link is provided to Institute's publications for better access. Details of available technologies of the Institute (www.cifa.nic.in) are linked with the project website (www.farmerfirstcifa.in).

- An episode of "Chaupal Charcha" by DD Kisan, New Delhi was prepared on Farmer FIRST Programme of ICAR-CIFA, Bhubaneswar. This was telecast on 4 February 2019 at 09:00 AM.
- A bilingual leaflet "Carp seed rearing can double aquafarmers' income- technical intervention of Farmer FIRST Programme proved it" is developed and is being distributed to farmers and other stakeholders to apprise them about the scope of the project as well as expectations from the stakeholders.
- Five beneficiaries of Farmer FIRST Programme attended the national workshop on "Let's listen to farmers: A workshop on farmers' feedback on doubling farm income by 2022" organized at ICAR-NAARM during December 22-23, 2017 (Fig. 2). The farmers shared their feedback and ideas on how to double their income by 2022.
- An exposure visit was organised under which 27 beneficiary farmers from Jagannathpur (Block-Balianta) and Dorbanga (Block-Balipatna) village participated and visited 3 ICAR institutes like ICAR-NRRI, Cuttack; ICAR-CHES and ICAR-CTCRI regional centre, Bhubaneswar on 31 August 2018.
- A field day on carp seed rearing was organised at Giringo village.

Other Activities

- On-site input production and management like vermi-composting, nursery of planting material, seed production, residue management etc.

Impact FFP on livelihood of farmers

Under Farmer FIRST Programme a study was conducted to assess the impact of improved agricultural practices on livelihood of adopted farmers. Data was collected from 87 randomly selected beneficiaries. A structured interview schedule based on DFID framework (1999) was developed and data was collected by personal interview method. The same interview schedule was introduced before i.e., in 2016-17 and after the intervention i.e., in 2019-20. The impact on livelihoods of farmers was measured through finding comparative position of physical, social, financial, human and natural assets of the farmers before and after adoption of the interventions. The mean value of overall standard of living of adopted farmers derived through addition of the index values of five assets was worked out to be 2.84 in post-adoption period against 2.41 in pre-adoption period. The gain was found maximum in the financial assets (25%), followed by natural assets (21%), human assets (19%), physical assets (15%) and social asset (14%). Overall gain in livelihood is worked out to be 18%. By applying paired t test, it was found that the project had a positive and highly significant impact on the livelihood of the beneficiaries.



Fig. 3. Backyard poultry: Income enhancement for small farmers

It was attended by 12 farmers from nearby villages. Sri Gadadhar Pradhan who has shifted from carp culture to carp seed rearing, following ICAR-CIFA package of practices, shared his experiences. The farmers learnt about the fish seed rearing and also appreciated the profit from fish seed rearing venture.

Significant Achievements

- TARM 1 cultivar of a green gram was demonstrated which gave an average yield of 6.75 q/ha in

demonstration plots (B:C ratio was 1.82). The yield of TARM 1 is 66% higher than the local check.

- Landless women farmers were trained to rear backyard poultry Kaveri and Vanaraja strain (Fig. 3). Male birds weigh upto 3-3.5 kg and female birds lay 20-25 eggs per month after 7 month of rearing. Eggs are of average weight of 55 gm. By rearing dual purpose breed, the beneficiaries got 1.79 times higher income as compared to the local breed.

- Composite fish farming gave an average yield of 3.0 t/ha. Higher yield led to enhanced per capita consumption of fish by the farmers. Application of lime, soil and water testing and supplementary feeding at regular interval and demonstration of advanced technologies controlled fish mortality and thereby minimized loss.
- Photo insensitive variety of cauliflower var. Fujiyama gave an average yield of 15 t/ha in the demonstration plots. Farmers were benefitted financially as it was harvested in offseason at a higher price.
- Minor carp was stocked in November in the backyard ponds. Minor carp (*Puntius gonionotus*) provide intermittent income to the farmers, species diversification; maximize biomass production and thereby giving consumers a better choice.
- Bush type French bean Falguni variety was demonstrated due to its strong and bushy nature. An average yield of 8 t/ha of green pods in 75-85 days was obtained (B:C ratio was 1.91).

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