Small scale aquaculture

Boosting rural livelihoods

Biswa Ranjan Samantaray, Satyajit Kumar Bhuyan and Surendra Kumar Ghadei

Farmers in Orissa adopted small scale aquaculture by participating in the Aquaculture Field Schools. They also took up fish culture in community resources, enhancing fish production and fostering social cohesion.

Farmers were educated on fish farming through Aquaculture Filed School

Aquaculture is one of the most important potential sectors of the national economy. Fish has been a staple food and its demand is increasing due to growing population and awareness on health benefits. Aquaculture is emerging as an important solution and the challenge is to make this growth more inclusive. Given the growing pressure on natural resources and the mounting threat posed by climate change, it is important to make it more sustainable. Aquaculture has the potential to generate income and create jobs, especially to the local youth. Being small and less risky, small-scale aquaculture can be adopted easily by resource-poor farmers.

Sustainable livelihood approach

Fish farming in rural areas mainly rely on natural productivity of the pond and can be enhanced by adding animal manure to the water, which increases carrying capacity of the pond. Such systems may not generate substantial financial returns to rural communities but a small increase in food security and nutrition security, particularly in terms of protein, will have a significant effect on the livelihoods of the rural people.

Betnoti block in Orissa consists of 1654 water tanks covering an area of 599 ha. This includes those owned by the Gram Panchayat and also by private individuals. Farmers in the region are adopting traditional to semi intensive type fish farming practices. As the block has a great potential for fish farming, the Krishi Vigyan Kendra (KVK) in Mayurbhanj took up an initiative to promote pisciculture, adopting Sustainable Livelihood Approach (SLA)

Sustainable livelihood approach (SLA) aims to reduce poverty and vulnerability in communities engaged in small scale aquaculture and fisheries. Through SLA the fish farmers are encouraged to enhance the pond carrying capacity, involve farm family, improve resource utilization, integrate different components in the fish farming and optimally utilize farm areas and farm wastes (Cow manure, vermicompost) to enhance the farm

income for the family livelihood and better sustainability.

With people at the centre of development, women's groups and fish farming groups with 15-20 members are formed. Small and seasonal ponds close to home are used. Pond water is fertilized to enhance natural food (green water); kitchen wastes and on- farm by products are used as feed. Vegetables are grown on the dykes using fertile pond water.

Aquaculture Field School

Aquaculture Field School (AFS) is a farmer to farmer extension method adopted by ICAR- CIFA to double the fish production and enhance farmers income. AFS is a school without walls for improving decision making capacity of fish farming community. The AFS also serves as a learning centre for fish farmers who can upgrade their skills on brood stock management, nursery and feed management, disease diagnosis, feed formulation, integrated farming, soil and water analysis and technology on culture practices of more than 25 fish species, including fresh-water prawn.

The main objective was to educate 2000 farmers per year of Mayurbhanj district with support from Odisha Skill Development Authority (OSDA), through AFS. On 24th July, 2017 AFS was initiated at Kailash Fish Hatchery in Astapura under Betnoti block of district Mayurbhanj of Odisha in collaboration with ICAR-CIFA.

AFS was held for a period of one week. Participants were trained on specific skills like happa breeding, breeding through portable as well Chinese circular hatchery, nursery and rearing hatching practices of Indian Major Carps (IMC) as well as minor and exotic carps. The participants were also oriented on preparation of balanced pelleted feed, pre and post stocking management practices. Besides these, participants became well versed with the technical knowledge like identification of fish seedlings at Fry-Fingerling stage, feeding methods and preparation of feeding schedule, beneficial effects of organic and inorganic manure in fish farming and also the marketing strategies like time of harvest and time of sale. After completion of the programme, the farmers were trained on small scale income generating activities like Fry-Fingerling production in seasonal ponds and seed production programmes through portable carp hatchery.

Box 1: Fish contribution promote nutritional wellbeing

Fish have a highly desirable nutrient profile providing an excellent source of high quality animal protein that is easily digestible and of high biological value. Fish, in particular, are an extremely rich source of essential fatty acids, including omega-3 polyunsaturated fatty acids (PUFAs), hence, important for normal growth and mental development, especially during pregnancy and early childhood. Fish are also rich in vitamins and minerals (especially calcium, phosphorus, iron, selenium and iodine in marine products). Fish therefore can provide an important source of nutrients particularly for those whose diets are monotonous and lacking in animal products. Increasing the availability of fish in the diet increases palatability and leads to increased consumption of a range of foods thereby improving overall food and nutrient intakes.

A permanent exhibition point for aquaculture technology was set up in the farm of Mr. Akshya Kumar Sahu, where any farmer can visit any day to learn about aquaculture technologies. The farmer maintains a link with ICAR-CIFA and Department of Fisheries, Govt of Odisha and Krishi Vigyan Kendra of the district on a continous basis. He serves as a facilitator for learning and fosters innovation among the farmers. The facilitator is also trained by the KVK on different aspects like duck farming, mushroom cultivation, bee keeping and backyard poultry and off- season vegetable production.

After the programme, there is a follow up action too. Mr. Akshya Kumar Sahu, the facilitator selects 5-7 participants from each batch of 25-30 participants and allows them to practice the technology in his farm, for a period of one month.

Aquaculture Field School

The steps involved in the process for formation of aquaculture field schools

- Identification of entrepreneur farmers through whom the technology can reach thousands of farmers.
- Collection of the basic aquaculture status in that area like leasing period of community ponds, aquaculture management practices, production, marketing etc.
- CIFA, Line department and KVK staff train the entrepreneur farmers.
- Assistance in creating basic educational facilities at the AFS.
- Operationalization of AFS on freshwater aquaculture.
- Preparation of farmer centered literature.
- Technical backstopping of trained farmers throughout the culture period.
- Follow up visit to the farms of trained farmers to reinstate new learning.

Fish farming is carried out in village community pond through the group approach

Around 800 participants have completed the training programme through AFS. Of them, four have started breeding through own portable FRP hatchery (Echo hatchery), 200-250 farmers are adopting the fish farming practices in their own pond and also in the leased out community pond and 70-80 farmers are adopting the fish seed rearing (Fry-Fingerling-Yearling) practices.

Community-based management

Community-based management approaches were tried to use common property resources for fishing purposes. With government support, fish farming is carried out in village community pond through the group approach. Like field school approaches, three women SHGs in Badasahi block and two women SHGs in Udala block and three men group participants were involved in the community fish farming approach. The technical support was provided by KVK along with the government department for carrying out appropriate pisciculture practices. By adopting community approaches the groups are able to produce fish to a tune of 08-12 q/acre with a return of Rs 58000 per acre, within a period of 6-8 months. The benefits are generally shared based on the number of mandays contributed towards the activity.

In the village Bhimtalli in Udala block in Mayurbhanj district, there is co-existence of one women's group and a farmers interest group practicing fish farming. The women group consists of 10 participants. There are many short seasonal ponds and with the technical guidance of KVK the women group has taken six private ponds (0.6Ha) on lease. Fry-Fingerling production practices are being carried out earning a net profit of Rs.42000/- within four months. The farmer interest group consists of 15 participants and they have taken two community village ponds on lease and are producing table size fish. They have earned a net profit of Rs.71000/- within eight months. The women's group is the supplier of the seed to this farmer interest group and also of the neighboring villages. Thus, quality seed supply was ensured.

Community-based management approaches were tried to use common property resources for fishing purposes.

Some factors were identified by the users as important for successful community resource management. These include, among many, small size of the group size which facilitates observation and monitoring of a collective agreement and social cohesion. Hence, through effective rural community based approaches, there is a great potential to sustainably utilise seasonal wetlands, swamps, flooded forests and mangrove forests in the region.

Endnote

The adoption of sustainable livelihood approach (SLA) and AFS have been proved as a boon to enhance the livelihoods of fishing communities. Of the fish harvested, around 40% is consumed by the household and 60% is sold in the market. This ensured both nutrition security and income security for the fish farming households. The initiative proved that appropriate methods coupled with appropriate technologies can draw rural women towards aquaculture practice in a sustainable way. Also management of community resources will go a long way in providing livelihoods and conserving natural resources. Rural aquaculture developed as an entrepreneurial activity, through co-management and community-based management approaches can be a financial viable option.

Biswa Ranjan Samantaray
Scientist (Fishery Sc.), Krishi Vigyan Kendra
Mayurbhanj-1
Shayamakhunta, Mayurbhanj-757049, Odisha
E-mail: brsamantaray@yahoo.co.in

Satyajit Kumar Bhuyan
Associate Professor, College of Fisheries, OUAT,
Rangeilunda, Berhampur, Odisha

Surendra Kumar Ghadei
District Fisheries Officer , Mayurbhanj, Odisha-757049