

FISH VALUE CHAIN

Quarterly Newsletter

ASSAM AGRIBUSINESS AND RURAL TRANSFORMATION PROJECT (APART) 1st Issue April 2019

OVERVIEW:

The fish value chain as a component of ASSAM AGRIBUSINESS AND RURAL TRANSFORMATION PROJECT (APART), is implemented by the Directorate of Fisheries and District Agricultural Technology Management Agency (ATMA) in collaboration with World Fish Centre (WFC) and private sector partners. This sub-component focuses on: (i) improving the quality of the inputs such as fish seed and feed for aquaculture, (ii) increasing the fish productivity and production from the pond/tank aquaculture systems, (iii) increasing fish production through culture-cum-capture fisheries activities in the beels, (iv) promoting diversification of fish species – particularly genetically improved strains - in combination with Indian major carps in the culture systems, (v) improved post-harvest management, value addition and marketing of produce by setting up fish farmer common service centres (CSCs).

The activities under the Fish value chain are:

- Establishment of Seed Multiplication centre for fast growing genetically improved fish strains for production of high yielding fish seed
- Improved Brood stock management and upgradation of hatcheries for quality seed production
- Monoculture/Polyculture technologies – in tanks and ponds
- Culture-cum-capture fisheries technology demonstration in beels
- Climate resilient Paddy-cum-fish integrated farming
- Productivity enhancement
- Pond & tank fisheries from existing 2.5- 3 tonne
- Beel fisheries from existing 0.5-1.0 tonne
- Fish-paddy integration from existing 0.5 tonne
- Credit linkage/ insurance workshop
- Field Days, Awareness camps, Value addition

IMPROVEMENT OF THE EXISTING MOLA FARMING SITE THROUGH APART

Polyculture is a technique of fish farming where the fishes in the pond feed on the available natural food in the pond, thus ensuring maximum out-put and higher

production can in extensive and semi-intensive systems. This method may give good outputs as fishes with different feeding habits are stocked in proper ratio and combinations. *Amblypharyngodon mola*, locally known as mola or moa is particularly important as the fish contains vitamin-A than any other edible fish species. A sustainable semi-intensive pond aquaculture technology, with small indigenous fish species (SIF) serves as a livelihood for the farmers', besides the major carp species also serves as a food for them. It has been observed that the nutritional





Small Indigenous fish varieties

intake of the rural people remains poor. People normally grow fish as cash crop and sell all their produce in the market saving little fish for their own consumption. Through polyculture, the aim is to change this concept by producing small indigenous fish along with carps.

The small indigenous fishes are a chief source of animal protein and micronutrients for the rural poor. Though several species of small indigenous fishes are considered suitable for aquaculture, among those, mola (*Amblypharyngodon mola*) is of special interest to the fish farmers because of its good taste. Its high nutritional value has created an equally great interest among the scientists. It is recorded that 100g mola contain approximately 1960mg, 1071 mg and 7.0mg of vitamin A, calcium and iron respectively.

Though the small fishes have always been regarded as competitors of carps in the polyculture system and therefore invariably eliminated but no studies have so far been made on the effect of small indigenous fish such as mola on the growth and production of carps in the system.

Consequently, an urgent need has been felt for species diversification on the basis of regionally available species. Small indigenous fishes (SIFs), which have been defined as species which grow to a maximum length of about 25 cm, have been considered as excellent candidate species for species diversification considering their superior nutritional contents, excellent demand and markedly high prices. For that matter, vitamin - A content of mola (*Amblypharyngodon mola*) has been reported to be 50-90 times higher than that of silver carp and mrigal.

Notably, these fishes can be easily cultured in the small, shallow and seasonal water bodies in Assam. Furthermore, it can also be cultured along with IMCs and other carps in perennial water bodies and can provide a disposable source of supplementary income to



Harvesting of Mola and Small Indigenous fish

rural households as these fishes easily attain marketable size within 3-months. Given the local demand for small indigenous fish species of freshwater origin, the FAO has also indicated the possibility of integrating such indigenous fish species into freshwater culture systems. Thus, bringing these fishes into scientific aquaculture fold can help better achieve the objectives of increasing fish production, enhancing nutritional security of the rural poor, providing greater employment opportunities, and conserving biodiversity in freshwater ecosystems.

From the observation of carp-mola farming practice in Assam, it is revealed that both fertilization and application of supplementary feed, resulted in better survival of all species with mola. With the introduction of mola, the growth of rohu, catla and mirror carp is reduced to some extent. This might be due to the fact that mola competed for food and space with all of them. Rohu is an omnivore with preference for debris and decaying. Again, the fry and fingerlings of catla are absolutely zooplankton feeders and show a greater preference for animal food with increase in size. Catla is strictly a surface feeder when small in size but feed in the middle and bottom layers as the size increased. Common carp prefers to feed on different food items at different sizes. Mola prefer to



Mola and SIF farming at Dimoria Development Block, Kamrup dist, Assam

feed on debris, animal and plant foods. Intermediate size fish are omnivore with a marked feeding preference for animal foods. Though the growth of rohu and mirror carp is affected with the stocking of mola, it is suggested that regular supplementary feeding and regular fertilization is mandatory for mola cultured fish ponds with carps.

It is to mention that the WorldFish, which is also known as the International Center for Living Aquatic Resources Management (ICLARM) is going to provide technical support to the Directorate of Fisheries in the implementation of the fisheries sub-component of World Bank financed “Assam Agriculture and Rural Transformation Project” (APART) for coming five years.

Keeping in line with the Project Development Objective of APART, the organization will provide technical contribution envisages accomplishing the objectives as secure and enhance the contribution of small-scale fisheries to food security in Assam. They will also support for increase the availability, access and consumption of nutrient-rich safe fish especially for women of reproductive age, infants and young children. The WorldFish Expert, Dr Benoy Kumar Barman, Resident Consultant Dr. R. Suresh and Fishery Co-ordinator, ARIAS Society Dr Sanjay Sarma also attended the various interaction programmes.

STOCKING OF QUALITY BROODFISH FROM NATURAL RESOURCES FOR PRODUCTION OF QUALITY FISH SEED AT FISHERY DEPARTMENTAL FISH FARM

Broodfish, are a group of mature individuals used in aquaculture for breeding purposes. Broodstock can be a population of animals maintained in captivity as a source of replacement for, or enhancement of seed and fry numbers. These are generally kept in ponds or tanks in which environmental conditions such as photoperiod, temperature and pH are controlled. Such populations often undergo conditioning to ensure maximum fry output. The brood fish management is

necessary to ensure the sustainability of aquaculture production, and to increase the number and quality of eggs produced and control the timing of maturation and spawning. Management of the technologies for gamete production in captivity is one of the essential step for aquaculture that would ensure the growth to this sector. Unfortunately, most fish when reared in captivity condition, exhibit some degree of reproduction dysfunction. Many species of captive fish are able to



Stocking of quality brood fish

reach reproduction maturity in aquaculture conditions and gonadal growth occurs normally. However, some of female species often fail final oocyte maturation stage. Hormonal manipulation and acceleration of final oocyte maturation due to the economics of broodstock management is important.

Under this background, the Directorate of Fisheries has selected for three Government Fish Farms for Brood Fish collection, so that the quality fish seeds are available to the identified clusters of the Project. In this regard, wild collected 271 KG Brood fish were stocked at Ulubari Fish Seed Farm, Guwahati on 31st March, 2019 at which the WorldFish Resident Consultant Dr R. Suresh, District Fisheries Development Officer, Kamrup, Project Consultants, Departmental Officers and Fishery Co-ordinator, ARIAS Society were present.

EXPOSURE VISIT TO ODISHA UNDER WORLD BANK FUNDED PROJECT ON ASSAM PROJECT ON AGRIBUSINESS AND RURAL TRANSFORMATION (APART)

In order to boost the productivity of Aquaculture through diversification of fish species, improved technology, an exposure visit to Odisha was proposed by the Department of Fisheries, Assam under World Bank financed project - Assam Project on Agribusiness and Rural Transformation (APART) under supervision of World Fish, Odisha. The team comprised of two (2) Fisheries Development Officers, nine (9) Technical Experts (Fishery) and fourteen (14) Engineering



Tilapia Hatchery, CIFA



Carp hatchery at Kausalyaganga



Feed mill, CIFA



Interaction with farmers



Ornamental fish culture unit, CIFA



Harvesting of Mola

consultants, Fishery. The visit was scheduled from 19th January, 2019 to 24th January, 2019.

During the exposure visit, the team visited Central Institute of Freshwater Aquaculture (CIFA), Bhubaneswar and held interactions with the officials of CIFA and

later visited the Tilapia Hatchery unit and also *carp* eco-hatchery and *rohu* hatcheries, Carp intensification cluster, National Freshwater Fish Brood Bank (NFFB). The team also visited feed mills and ornamental fish unit, and held discussions with CIFA officials on carp mola polyculture, importance of health management in fishery and over all fish marketing system in Assam, besides breeding technology of carp and management practices, etc.

It was a great learning opportunity for the team to learn and get more information and knowledge on Bio security fencing, Fish on Wheel, Carp mola culture, Aquaponics, Management of Brood bank, etc., Ornamental fish breeding and culture was an upcoming and new venture of business for the state as state is potential of indigenous spp. Fish on wheel, to add to the fish and by-products was an innovative idea that the team could learn.

SEMINAR ON USE OF GIS IN FISHERIES AND AQUACULTURE IN ASSAM



Participants of the Seminar

A seminar to assess the different production system and target technologies was held at the College of Fisheries, Raha, Nagaon on 14th February, 2019. The seminar discussed the relative influences and use of Geographic Information system (GIS) in fisheries and aquaculture sector. The seminar was held under the World Bank funded Assam–Agri Business and Rural Transformation Project (APART). Dr Sushanta Barthakur, Professor, Aquaculture Division briefed on the objectives of the seminar and Dr Sanjay Sarma, Fishery Co-ordinator, ARIAS Society explained the Project Development Objectives of APART. The Technical

session was addressed by, Dr Shwu Jhao, WorldFish Expert, Malaysia, who explained the quantifiable factors that can mapped such as temperature, the availability of water and other inputs such as seed and feed, terrain and soil conditions. He also explained that Market access and labour resources can also be mapped using GIS model that matches aquaculture requirements with available resources to determine both the potential and the limitations of target areas. She also explained the GIS and Bayesian network models constitute a decision-support toolkit for stakeholders to help focus aquaculture development in the most promising locations. Amongst

others, Dr K.K. Tamuli, Dean, College of Fisheries, Dr J. Pant, WorldFish Expert, Dr R. Suresh, Residential Consultant, WorldFish under APART also interacted

with the participants. A total of fifty participants from different organizations of the State attended the Seminar.



Seminar on use of GIS in Aquaculture in progress

TRAINING OF TRAINERS (ToT) FOR THE DEPARTMENTAL OFFICERS



Participants during the ToT programme

To impart the training to the farmers within the cluster area under APART, the College of Fisheries under Assam Agricultural University has completed ToT programme from 14th- 16th February 2019 covering 45 Departmental Officers and Project Consultants.

A training manual namely, "Fisheries and Aquaculture practices for rural Transformation" was also published under these ToT programme. Experts from WorldFish were the main resource persons for the ToT.

ZONAL WORKSHOP OF APART UNDER FISHERIES COMPONENT



Hon'ble Minister of Fisheries, Assam, Deputy Commissioner, Cachar and other dignitaries on the dais

A zonal workshop was organised by the Directorate of Fisheries under APART, at Silchar on 27th January, 2019. Senior Departmental Officials including Director of Fisheries, Assam, Deputy Commissioner, Cachar addressed to the august gathering. Attending the programme as the Chief Guest, the Hon'ble Minister of Fisheries, Assam, Shri Parimal Suklabaidya, stressed for proper utilization of the fishery component of APART

under World Bank funded project at Barak valley. The various office equipments were also distributed to the Distinct PIU of Cachar by the dignitaries on the dias. A total of 150 participants, mostly fish farmers from across the district attended the workshop. Smt Laya Madduri, IAS, Deputy Commissioner, Cachar, District Development Manager of NARBARD, Cachar, Project Director, ATMA and other Govt officials were also part of the workshop.

PHOTOGRAPHS OF FISHERY ACTIVITIES UNDER APART



WOMEN BENEFICIARIES BENEFITTED THROUGH APART



HYGIENIC DRY FISH DEMONSTRATION



Published by:

ARIAS Society

(An Autonomous Body of Govt. of Assam)

Agriculture complex, Khanapara, G.S. Road,

Guwahati-781022 (Assam, India)

Tel: +91 361-2332125; Fax: +91 361-2332564;

email: spd@arias.in, Website: www.arias.in

Grievance: grievances@arias.in