



सत्यमेव जयते

मत्स्य भारत

Matsya Bharat



Newsletter of the National Fisheries Development Board

Volume 7, Issue 5

January - March 2016



Mola Carplet Amblypharyngodon mola (Hamilton, 1822), an
SIS (Small Indigenous Species) fish of great promise

In this Issue

	Page No.
From the Chief Executive	3
By Invitation	5
1. North and Northeast	8
2. Farmers' Note Book	26
3. New/Innovative Technologies in Fisheries	32
4. NFDB Initiatives	33
5. Important Events	38
6. NFDB Field Notes	46
7. Fishers & Farmers News	52
8. Fisheries & Aquaculture Industry News	54
9. NFDB News	56
10. NFDB in the Media	57
11. Announcements	58

Chief Editor & Publisher:

Shri K.N. Kumar, IAS
Chief Executive
National Fisheries Development Board
Hyderabad – 500 052.

Associate Editor:

Dr. K. Ravindranath, Sr. Consultant (Tech)

[Mail to: matsyabharat@gmail.com]

Days to Remember

Feb 02	World Wetlands Day
March 22	World Water Day
March 23	World Meteorology Day
April 05	National Maritime Day
April 16	World Entrepreneurship Day
April 22	International Mother Earth Day
May 22	International Day for Biological Diversity
May 23	World Turtle Day
May 24	World Fish Migration Day
June 05	World Environment Day
June 08	World Oceans Day
July First Saturday	International Day of Cooperatives
July 10	National Fish Farmers' Day
	NFDB Formation Day
July 11	World Population Day
Sept 16	International Day for Preservation of Ozone Layer
Sept 18	World Water Monitoring Day
Sept 26	World Hunting & Fishing Day
Oct First Monday	World Habitat Day
Oct 16	World Food Day
Nov 21	World Fisheries Day
Dec 03	World Conservation Day
Dec 05	World Soil Day
Dec 14	World Energy Day

Seasonal Fishing Ban/ Closed Season

East Coast of India	15 April to 14 June
West Coast of India	01 June to 31 July

From the Chief Executive



K.N. Kumar, IAS

Chief Executive, NFDB

Need for a strong Outreach

Admittedly, the Fishery Extension system in our country is not so well developed as the Agriculture Extension system. Even where some institutional structures for Fishery Extension are erected by the State Governments they seem to function below par, either due to poor manpower deployment, or limited competencies and financial resources. The net impact is inadequate reach of the newer and more productive technologies to the fish farmers. The Fishery Extension Officers (FEOs), wherever they are in position, as also the Fishery Subject Matter Specialists (SMSs) of the Krishi Vigyan Kendras (KVKs) are not sufficiently empowered to make a significant impact in transferring technologies to the fish farmers. That is not to say that there have been no successes. Most successes we see in the country however, are due to the entrepreneurship spirit of the farmers, especially the early learners and innovators. The story of poor fishery extension is more or less similar across the country.

There are other problems too relating to the technology development, demonstration and transfer. The technology transfer cycle itself is too long-winded and by the time it reaches a farmer, it is mostly obsolete. The crux is that there is not much interface between

the technology developers, technology providers, technology demonstrators and the end-users. There is no one common platform that brings them all together. Several developed technologies are languishing in the shelves of the laboratories of institutions as the providers are not ready to commercialize them. One study indicates that only about 11% of the technologies developed by the agricultural research system are actually commercialized. And, how many of those commercialized technologies have actually seen the market place and reaching the farmers is anybody's guess. It is necessary that we do something to coordinate all the components of this cycle so all of us come together and provide a positive cycle of knowledge and technology transfer. We have to begin somewhere and I see a role for the NFDB here, being the mandated organization to promote the sector. Until we do something to bring all the four players together we cannot connect the dots. I am happy to inform that recently the NFDB facilitated an MoU between the CIFE, which developed a low cost hatchery; and an entrepreneur, Teewave Technologies, who has agreed to undertake a mass scale production of that low-cost hatchery. It is expected that the cost of producing fingerlings would come down substantially once the low-cost hatchery becomes available. A detailed description of the low-cost hatchery has been given in the previous issue of the *Matsya Bharat*. Such facilitation should become more frequent.

It is beyond argument that there is a strong case for reviving the Fishery Extension system in the country within the broader framework of the ICAR and the State Governments. At the last count, there are 642 KVKs in the country, but only 118 have Subject Matter



Specialists in Fisheries. A country as large as ours will need many more than that number to make any difference. One need not overstate the fact that absence of competent manpower in the right places hurts the country in several ways. Of the 642, there are only two KVKs exclusively for Fisheries. Undeniably, since Fisheries is a state subject, a large part of the responsibility has to be necessarily shouldered by the State Governments. But we too have a responsibility to erect a better Fishery Extension system. One important point is that we should urgently work toward enhancing the number of SMS in Fisheries in the KVKs to 642.

The capacity building of the SMSs is also another issue that requires to be looked into in right earnest, by the ICAR system as well as the NFDB. At the NFDB we are very keen to get involved with the KVKs through the ATARIs (Agricultural Technology Application and Research Institutes) for a better reach out with the farmers. A national workshop with the Fisheries SMSs is also in the pipeline so their capacity building needs are accurately understood. The Fisheries SMSs should be prepared for taking on a much larger and meaningful role in building the momentum in the country for triggering a Blue Revolution. They should engage themselves in building the capacities of the farmers intensively.

If we visualize a target of doubling the present fish production of nearly 10 million tonnes by the end of the next plan period we will need to make right kind of investments on developing the human resources, especially of the farmer-entrepreneurs and to establish a better structured institutional delivery model. That will call for identifying new players with commitment

and conviction. That will include the civil society, the ATARIs, and the farmer-entrepreneurs. Until we do that urgently and earnestly, we cannot achieve the ambitious target of doubling the fish production to 20 million metric tonnes (MMT). Even at that level we are still far behind China, a comparable country, in all respects but produces 65 MMT fish a clear 55 MMT more than what we are currently producing. Time to act, is now!

Farmer capacity building should be of high priority for the KVKs, especially in cutting edge technologies of fisheries, viz., culturing non-carp species, establishing hatcheries and promoting feed mills, etc. I also see a role for the ATARIs to emerge as stand-alone windows for channeling the NFDB funds for promoting the fisheries sector. The other aspect is to connect the farmers with the researchers so the actual requirements of the farmers are carefully listened to and understood by the researchers. Publicly funded research has to be functional and useful for the mainstream fisheries. At the NFDB we have commenced our effort in this direction.

Dr. M.V. Gupta has contributed an invaluable article in this issue of the *Matsya Bharat* that seeks to define the contours for developing the sector in India. Also, I am happy to inform that the print order for *Matsya Bharat* has now touched 5000 copies, owing to tremendous demand from various quarters of the country. I am also pleased to inform you that we will soon be launching the Hindi version of the *Matsya Bharat* to cover more people and important States like U.P., Bihar and the central region. It may not be too long before we reach all those who matter in the fisheries sector of the country.

By Invitation

Future Food Fish Demand and Challenges to be Addressed



Dr. M. Vijay Gupta

World Food Prize and

Sunhak Peace Prize Laureate

By the year 2050 global population is expected to cross 9 billion and food production has to be doubled to meet the demand. The fisheries planners/ administrators and scientists are concerned whether fish as a component of food basket would be able to meet the demands of increasing population combined with increased consumption as a result of better understanding of health benefits of consuming fish as compared to other meat products and the increasing affluence, leading to higher purchasing power. In 2012, global quantity of fish produced is twice that of poultry and three times that of beef. Thirty seven percent of global production of fish is traded internationally making fisheries sector as one of the most globalised and dynamic food industry, with its value exceeding the value of international trade in other agriculture products combined – rice, meat, milk, sugar and banana. In spite of this, fish does not attract much attention in food security discussions and national plans. The situation is slightly changing now with more attention being paid to the sector.

Global food fish production in 2013 reached 160 million tons, with aquaculture contributing 70 million metric tons. Global capture fisheries production has more or less stabilised at around 90 million metric tons. A recent study indicated that globally 53% more marine fish are exploited than officially recorded and the marine stocks are declining at a faster rate than thought so far. For 2010 they estimated that 109 million tons were taken from oceans than official

figure of 77 million tons. If this is the case with marine fisheries where catch statistics are much better, one can imagine the status of inland capture fisheries statistics, as the sector is widely dispersed and a large population living around the river systems fish and depend on the resource for their animal protein requirement and livelihood. These catches are not often reflected in the statistics. This indicates that the per capita consumption of fish is much more than what is said officially – 19.2 kg per annum globally and 9.0 kg in case of India. Also, contribution of fish to animal protein intake of population is much more than estimated and could be playing a much bigger role in nutritional security.

Consumption and demand for fish is increasing globally and estimates made by various agencies on the demand to year 2030 have put the need for an additional 30-40 million tons. In India probably we need to produce about 18 million tons by 2030, as compared to 10 million tons that we are producing today, i.e., an additional 8 million tons in the next 14-15 years. This would necessitate increasing our aquaculture production from about 4 million tons now to 12 million tons in the next 15 years, as there is little potential for increasing production from capture fisheries – both marine and inland. While the marine capture fisheries sector is suffering from over capacity in fishing, inland sector is suffering in addition to over-exploitation, from pollution of rivers, diversion of waters for irrigation, etc. Added to this, the looming climate change will impact both marine and inland fisheries.

Because of the above, emphasis is being laid on increasing production from aquaculture. While it is necessary to give importance to aquaculture to meet the demand, let us not forget the contribution of capture fisheries on which millions of fishers depend for their livelihood and consumers, especially the low-income groups. In some of the developed countries, governments are buying the excess fishing capacity – the boats and either destroying them or putting them to some other uses other than fishing. While that is possible for rich countries, India cannot afford such an intervention. What is needed is to discourage new entrants in to the industry and at the same time make efforts to employ the excess human capacity, especially the younger generation in other activities – aquaculture,

agriculture or some other industrial activity. This is in addition to the implementation of closed seasons, controls on mesh size and gears, etc. that are in force now. If this is not done, we may see a situation that is happening in the agriculture sector – fishers committing suicide due to lack of catches and loss of livelihoods. Let us hope we will not reach such a situation.

In the aquaculture sector, there is high potential for increasing production. In the last three decades, global aquaculture production has increased by 12 times, with an average annual growth of about 8%, turning out to be the fastest growing food sector. The same is true in the case of India and the potential for further growth is high as our resources have been under-utilized so far. Asia is the cradle of global aquaculture production with over 90% contribution to global production. China, the top producer of aquaculture produced 43.5 million tons in 2013 while India produced only 4.1 million tons, or one tenth of what China is producing indicating opportunities for increasing production. Our production or the number of species we farm, or exports of aquatic products, as compared to many other countries in the region are very low for various reasons. While we have done comparatively well in the case of freshwater and brackish water aquaculture, being the second largest producer of freshwater aquaculture in the world, we are still in the primary stages of development of mariculture. We need to develop seed production and culture technologies for a large number of marine commercial species and in the case of species where seed production technologies have been developed such as Cobia, Seabass, Pompano, etc., we have to upscale the technologies to a commercial production level.



Asian Seabass/ Barramundi: Lates calcarifer

The world is progressing so fast in aquaculture, coming up with intensive systems such as RAS, Biofloc, etc., with increasing number of species being farmed. The sector has reached such a stage that unthinkable is happening. We



Pompano: Trachinotus blochii



Cobi: Rachycentron canadum

have never thought of breeding and farming of oceanic species such as tunas. Success has been achieved in breeding Blue Fin Tuna and the technology has to be perfected before the stage is set for their commercial production.

While the opportunities are high for increasing aquaculture production to meet the growing demand, there are also a number of challenges that need to be addressed for sustainably increasing aquaculture production without impinging on the environment. While the demand for fish is increasing, the resource base – land and water is declining, which would mean we have to go for intensive systems to optimize land and water use. This intensification as is to be expected will lead to higher fish health problems and hence investments in fish health management research will be needed.

The other challenge is the feed. Already there is shortage of raw materials for feed formulation with increasing prices and this is going to be accentuated in the future as the aquaculture sector has to compete with other sectors for feed ingredients. One of the concerns of the aquaculture feed sector is that the fishmeal and fish oil production which is finite will not be able to meet the future demands of the sector. To me, this is not a big problem as fishmeal and fish oil could be replaced with plant substitutes as has been

demonstrated by the Salmon aquaculture industry in Norway. Also FAO estimates indicate that the future increased production will be more from filter feeders and omnivores such as carps as compared carnivores such as marine fish.

An area where India has done very little and needs to do more is diversification of species in our farming system. We have been mostly depending on carp species – that too Catla, Rohu and Mrigal, forgetting many other minor carps. In the absence of diversification of native species, exotics are being introduced in to the country posing threats to biodiversity. We have the examples of *Pangasius*, Pacu, etc. Since we did not or could not breed our indigenous *Pangasius pangasius*, farmers have imported *Pangasius sutchi* and the species is very much established in our culture system.



Pangas catfish: Pangasius pangasius



Sutchi catfish: Pangasianodon hypophthalmus (=Pangasius sutchi)

Seed quality and certification is an area where we have not paid much attention so far. Many studies have indicated that our hatchery bred stocks are worse than the wild stocks due to years of inbreeding in hatcheries. Enormous increases in crop and livestock yields we are seeing today are because of use of improved varieties/breeds the sectors are using. Aquaculture is way behind agriculture and livestock in terms of production and use of improved strains. Globally, less than 10% of production comes from improved varieties of fish and shell fish. In India, Rohu has been genetically improved for over 8 generations with growth improving by some 23% as compared to other stocks of Rohu, but unfortunately we have not developed a system

for their dissemination, consequently, investments made in genetic improvement of Rohu have not paid off. Imagine 23% increase in Rohu production in the country if all farmers use Jayanti Rohu. It is high time that strategies are developed for dissemination of already developed improved strains such as Jayanti Rohu, Genetically Improved Farmed Tilapia (GIFT) and Giant Freshwater Prawn and efforts are made for genetic improvement of other commercially important species of fish and shell fish.



Genetically Improved Jayanti Rohu (left above alongside normal Rohu left below) and GIFT Tilapia (right)

Globally over 80% of aquaculture production comes from small-scale farmers and in India it is no different. In our enthusiasm, we should not forget to take care of the needs and survival of these small-scale farmers who are the backbone of aquaculture industry. They need technologies and technical knowledge, bargaining power for input supply and marketing of outputs. A beginning is being made in the formation of Fish Farmer Producer Organisations (FFPOs) which need to be encouraged and supported by government and non-government agencies.

One area that is getting attention in recent times is culture based capture fisheries. We have vast areas under reservoirs, tanks, flood plains, ox-bow lakes, etc., fish production from which are very low. Stocking of these natural water bodies and managing them on a scientific basis is paying dividends in recent times. Added to this, cage and pen culture in these natural water bodies has been found to be quite lucrative and when done properly could result in creating employment/ livelihoods among landless population.

I have mentioned earlier that our aquaculture production and technologies as compared to those of other countries in the region are way behind. One of the reasons for this is weak linkages between research and development. While a number of technologies, methods, modules have been developed or being developed in our research institutions, State Agriculture and Fisheries Universities and Colleges, they often do not see the light of the day in terms of commercialization. The need is for good collaboration and cooperation between research institutions, development agencies and the farming sector. NFDB needs to be complimented for taking steps in this direction.

1. North and Northeast

1.1 NFDB funded fisheries projects in Uttar Pradesh reviewed for progress and to identify further needs of the State

Uttar Pradesh is endowed with 1.73 lakh ha ponds & tanks, 1.56 lakh ha reservoirs and 1.33 lakh ha lakes including flood plains and 28,500 km rivers for capture and culture fisheries. Out of the total freshwater ponds and tanks, 1.63 lakh ha are Community Ponds of which only 50% are being utilized for extensive aquaculture by merely stocking and harvesting resulting in poor fish yield. A large number of fisher population earn livelihood from the sector. Currently the state produces 1500 million fry against the demand of 2600 million fry. Out of the total aquaculture resources only 80% are utilized for fish culture following traditional practices. The State's rate of production from culture ponds and tanks is 3.6 ton/ha/yr. Demand of fish in Uttar Pradesh is 15 lakh metric tons (15kg/ capita/ year for 54% fish eating population of the State) against the total production of 4.9 lakh metric tons. To meet the demand in the local markets, about 60% of fish is imported from other States. It is necessary to augment quality fish seed production and fish productivity through scientific fish farming in ponds, tanks, reservoirs, oxbow lakes and wetlands of Uttar Pradesh. Various schemes have been launched with NFDB assistance for the development of fisheries in Uttar Pradesh.

Dr. Radheyshyam, Sr. Consultant (Fisheries) undertook an inspection of the NFDB funded project sites first from 27th January to 3rd February 2016 along with Dr. Raj Naresh Gopal, Sr. Executive (Tech) and Ms. K. Bhargavi, Executive Assistant, NFDB, and again from 12th to 17th March 2016 along with Mr. P.P. Sharma Consultant (Fisheries), NFDB, and discussed project-wise financial and physical progress with Dr. S.K. Singh, Joint Director, Fisheries, Dr. Salim Sultan, Chief General Manager, Matsya Vikas Nigam, Dr. Nurul Haque, DDF, and Dr. Monisha Singh ADF and other fisheries officials of the Govt. of Uttar Pradesh concerned with the NFDB funded projects.

(i) Modernization work on Wholesale Fish Market at Dubagga, Lucknow

Dubagga Wholesale Fish Market, Hardoi Road, Lucknow, is one of the biggest fish markets in Uttar Pradesh, where 10-15 truck load fishes are marketed per day. This wholesale fish market has potential for marketing up to 15 tons fish per day. Fishes are imported from States such as Andhra Pradesh, Gujarat, Rajasthan, Madhya Pradesh, etc., and supplied to fish markets in towns such as Jhansi, Etava, Auraya, Kanpur, Fatehpur, Bundelkhand, Gorakhpur, etc. Fresh fish and dry fish are sold separately in the market.

The total estimated cost of modernization of Dubbagga fish market is Rs. 102.3305 lakh, out of which NFDB sanctioned Rs. 92.10 lakh and released Rs. 46.05 lakh in two installments



A view of Dubagga Wholesale Fish Market, Hardoi Road, Lucknow, Uttar Pradesh

(1st installment, Rs. 9.21 lakh & 2nd installment, Rs. 36.84 lakh). The fish market was inspected along with Dr. Nurul Haque, DDF, Dept. of Fisheries, Mr. S.K. Srivastava, J.E. and Mr. A.K. Yadava, A.J.E. of the Mandi Parishad, Lucknow.



Mr. S.K. Srivastava, J.E. of the Mandi Parishad showing the auction platform renovated with NFDB assistance at Dubagga Wholesale Fish Market, Lucknow



Dry fish for sale on cemented platform in Dubagga Wholesale Fish Market at Hardoi Road, Lucknow

Mr. S.K. Srivastava, J.E. of the Mandi Parishad informed that in this market 42 fish outlets will be renovated and 10 new shops will be constructed. The following works were found completed on the date of visit: (i) Renovation of 52 shops, (ii) Veranda upgradation, (iii) APF flooring, (iv) Compound wall, (v) Ladies changing room, (vi) Water stand post.



Ladies changing room and drinking water facilities constructed with financial assistance from NFDB at Dubagga Wholesale Fish Market, Lucknow

(ii) Renovation of Retail Fish Market at Hastinapur, Meerut district

The Dept. of Fisheries, Govt. of Uttar Pradesh, proposed for the renovation and expansion of the Retail Fish Market in Hastinapur, Meerut district. The total estimated project cost is Rs. 54.88 lakh, of which NFDB sanctioned Rs. 49.49 lakh, and released Rs. 24.695 lakh in two installments (1st installment of Rs. 4.939 lakh and 2nd installment of Rs. 19.756 lakh).



NFDB Officials inspecting and discussing progress of renovation and construction work at Hastinapur Retail Fish Market, Meerut district, U.P.

The CEO, Meerut, informed that the 1st installment amount was utilized for construction of 881 sq m of internal road of the fish market, and with the 2nd installment amount, construction of fish market platforms with shed, renovation of 21 old fish retail outlets and construction of 9 new shops will be completed within two month period.



Roof-level construction at Hastinapur Retail Fish Market, Meerut district, with the financial assistance of NFDB, Hyderabad

(iii) Sun Drying Platforms constructed by Matsya Vikas Nigam, Pilibhit, Uttar Pradesh inspected

NFDB sanctioned Rs. 26.46 lakh to Matsya Vikas Nigam, Pilibhit, Uttar Pradesh, for construction of 84 Sun Drying Platforms at the sites of ten reservoirs. A sum of Rs. 18.522 lakh was released as 1st installment. Out of 84 fish sun drying platforms 36 have been constructed at Sardasagar Reservoir which is situated at a distance of 300 km from Lucknow near Uttarakhand and Nepal border.

The Sardasagar Reservoir has a water spread area of 6200 ha. It receives water from Sarda River. The length of dam on the reservoir is reported to be about 12 km and at the site of the dam large number of fishers had settled during 1971, mostly migrated from Bangladesh. Daily about 250 fishermen catch fish from the reservoir. The reservoir was leased out for a term of 3 years on an annual lease value of Rs. 1.33 crore with 10% increase every year.



Fish Sun Drying Platform construction with the financial assistance from NFDB at the site of Sardasagar Reservoir, Uttar Pradesh

At the site of the reservoir 36 sun drying platforms (3.20 m x 3.20 m size each) have been constructed and used by the lessees.

The peak fishing season is from November to January when huge quantity of fishes (over 10 tons per day) are captured. Fishermen prefer to sell fresh fish to the consumers directly or indirectly. When fishermen are unable to sell the fishes in fresh condition, they used to dry fish in bulk on the ground in an unhygienic manner. However, after construction of Sun Drying Platforms they dry surplus fishes on them. During the last season about 6 ton of fishes having less market value have been sun dried on those platforms. Each platform has the capacity to dry 100-150 kg fishes in single operation.

The lessees informed that sun drying of fish on platforms has the following advantages over drying on soil: (i) it is easy to handle, (ii) no discoloration of dried fishes, (iii) takes less time for drying (about 5 days), (iv) less vulnerable to pest infection, thereby quality is improved and biomass loss is reduced, and (v) fish dried on platforms are preferred by the consumers and fetch 30-50% higher market price.

(iv) Monitoring and Evaluation of Project assisted by NFDB to Matshya Jivi Sahakari Samiti, Hardoi, Uttar Pradesh

During 2013-14 NFDB sanctioned and released Rs 20 lakh to Matshya Jivi Sahakari Samiti for renovation of existing ponds and one time inputs for fish culture in 80 ha in Hardoi district. Pond renovation is going on. The fish farm was inspected on 30.01.2016. There are 50 fisher community members in the Samiti including 10% belonging to SC community. Society took 125 ha fish farm on lease, which was constructed on unproductive/under productive low lying saline land.



Dr. Radheyshyam, Sr. consultant (Fisheries), inspecting NFDB assisted pond-renovation work of Matshya Jivi Sahakari Samiti in Hardoi, U.P.

There are 50 ponds of different size in fish farm. Society members prepared the ponds and stocked *Pangasius* fingerlings of 0.5 g @25,000/ha. Along with *Pangasius* seed, Rohu, Catla, Mrigal, Common Carp, Grass Carp and Silver Carp fingerlings of 4-6 g were also stocked @2,500/ha. Fish were fed daily with formulated feed which was prepared in NFDB assisted Fish Feed Mill (of Shri Shyam Prakash) in Hardoi. Water exchange was done when needed periodically. Culture was carried out for 8 months from April to November. *Pangasius* grew to over 1.0 kg in 8 month. FCR was 1.2. *Pangasius* production was a record 23.63 t/ ha/ 8 month. IMC along with exotic carp production was 1.72 t/ ha/ 8

month. Thus the gross production was 25.35 kg/ ha/ 8 month (i.e. about 38 t/ ha/ yr). Cost of fish production worked out to Rs.60/ kg fish. *Pangasius* was sold @ Rs.100-120/kg while the carps were sold @ Rs.150-160/kg.



A haul of fish from one of the NFDB assisted renovated ponds of Matshya Jivi Sahakari Samiti in Hardoi, U.P



Retail fish vendors transporting fish from the Matshya Jivi Sahakari Samiti Farm in Hardoi, U.P., on Motorbike and Bicycle for selling in remote area

In 1.0 ha pond duck-fish farming was carried out by the farmers. Pond was fenced with nylon net to prevent ducks escape. Pond embankments were utilized as dry run whereas, pond water as wet run for the ducks. Pond was stocked with large size fingerlings of carps. Fish were not provided supplementary feed. For 1.0 ha fish pond 1000 ducks were reared. Ducks are fed with concentrate food along with aquatic weeds. Ducks consume unwanted aquatic insects/ organisms from the pond. Duck-fish integrated farming is in progress.



Ducks on dry run in integrated duck-fish farming system in NFDB funded scheme to Matshya Jivi Sahakari Samiti in Hardoi, U.P

(v) Monitoring and Evaluation of projects sanctioned by NFDB to Farmers and Entrepreneurs in Kushinagar and Maharajganj districts

NFDB provided assistance of Rs. 0.4 lakh to Mr. Nurul Amin in village Kuchiapar, Fazilnagar Block in Kushinagar district for *Pangasius* culture in 0.4 ha pond during 2014-15. Pond was prepared and stocked @ 12,750 fingerlings/ha. Fish were fed with commercial formulated feed. In 8 month culture period fish grew to 1.0 -1.5 kg. He harvested 2,500 kg *Pangasius* in 8 month from 0.4 ha pond. He earned about Rs. 1.18 lakh by expending Rs. 1.32 lakh. The farmer said that he would continue *Pangasius* farming in 2016.



NFDB assisted beneficiary weighing Pangasius fish on his farm in Kushinagar district of Uttar Pradesh

NFDB provided assistance of Rs. 0.7 lakh to Smt. Jabunnisha in village Kuchiapar, Fazilnagar Block in Kushinagar district as one time inputs cost for *Pangasius* culture in 0.7 ha during 2014-15. She purchased fingerlings of *Pangasius* @ Rs. 4.0 each and stocked the pond @ 14,286 fingerlings/ha in the month of March. In 8 month culture, fish grew to over 1.0 kg. She harvested 10.7 ton fish/ ha/ 8 month. Fish was sold @ Rs 100/kg. She earned Rs. 3.67 lakh net income. Cost of fish production was estimated to Rs. 75/kg. After seeing the production and profitability she developed confidence and is planning to continue *Pangasius* farming in 2016.



NFDB assisted beneficiary serves feed to Pangasius on a farm in Kushinagar district of Uttar Pradesh

NFDB provided assistance of Rs 0.73 lakh to Mr. Rishikesh in village Bhagawanpur, Malauna Block in Kushinagar district as one time input cost of *Pangasius* farming in 0.73 ha pond during 2014-15. Farmer prepared the pond and stocked *Pangasius* seed in March. Fish were fed with formulated commercial feed daily. In 7 months fish grew to above 1.0 kg. Farmer started harvesting after a 7 month culture. Fish was sold @ Rs 100/kg. He made a net income of Rs.2.13 lakh from 0.73 ha pond in 8 month and is planning to continue *Pangasius* culture during 2016 also.

Mr. Manoj Kumar Rai, a progressive farmer in village Bagahi, Tamkuhi Block, in Kushinagar district. Mr. Rai had undergone NFDB assisted Training and Exposure Visit in Andhra Pradesh. After seeing for himself the scope for fish farming and profitability, Mr. Rai took 2.8 ha village community ponds on lease. He prepared 1.0 ha pond exclusively for *Pangasius* culture. Pond was stocked with fingerlings @ 75,000/ha each weighing 2.4 g. In 6 month culture period fish grew to 0.7-1.5 kg. Farmer produced fish @ 50 t/ha/yr. Fish was sold at farm gate @ Rs120/kg. The cost of fish production was Rs 60/kg.



NFDB assisted beneficiary releasing Pangasius fingerlings on his farm in Kushinagar district of Uttar Pradesh

In addition to *Pangasius*, Mr. Rai also undertook carp culture by stocking the leased ponds with IMC and exotic carp yearlings of 100-200 g each @ 7,500/ ha. Fish were fed with formulated feed. In 6 months fish grew to above 1.0 kg. Mr. Rai achieved a production of 15.0 -17.5 t/ha/yr, and he was honoured by the District Magistrate, Kushinagar and C.D.O. Kushinagar for his outstanding achievement in fish farming in Kushinagar district.

NFDB provided financial assistance of Rs. 6.16 lakh during 2014 to Shri Dharmendra Singh of Siswa Bazar village in Maharajganj district of U.P. (near Nepal Border), towards new ponds construction and one-time inputs cost for *Pangasius* culture. A total 10 ponds covering 2.73 ha were constructed and utilization certificate of the amount sanctioned was submitted by the implementing agency. Since then *Pangasius* culture is being continued.

Four Live Fish Seed Transport Vehicles (Bolero Pickup)

purchased by entrepreneurs with NFDB assistance were inspected and their Registration Certificate (RC) Numbers noted: RC No. UP53CT-7588 allotted to Mr. Ajai Kumar Singh, Gorakhpur; RC No. UP53CT-7999 to Mr. Pramod Kumar Singh, Gorakhpur; RC No. UP56T-5390 to Mr. Sabir Husain, Maharajganj and RC No. UP57T-6564 to Mr. Ramashish Singh, Kushinagar. The vehicles are being put to effective use and the beneficiaries are successfully carrying out their business.



Live Fish Seed Transport Vehicles purchased with NFDB assistance by entrepreneurs in Gorakhpur, Maharajganj and Kushinagar districts of Uttar Pradesh

(vi) Review of projects sanctioned by NFDB to ICAR-NBFGR, Lucknow

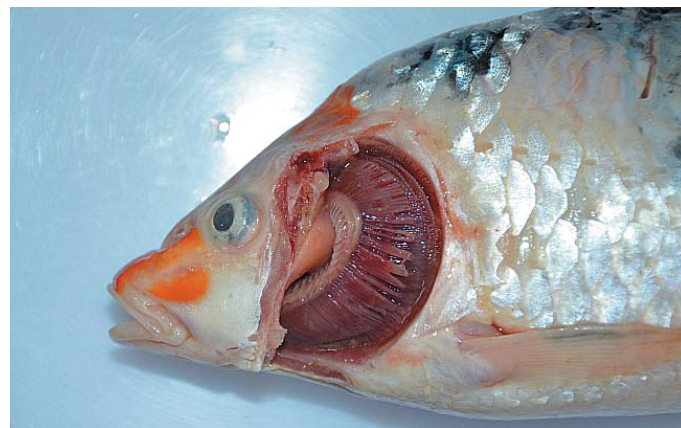
NFDB sanctioned a research project entitled “*Risk and benefit assessment of an illegally introduced fish species Pacu - *Piaractus brachypomus* in India*”, to the National Bureau of Fish Genetic Resources (ICAR-NBFGR) and released an amount of Rs. 30.75 lakh. Dr. P.K. Pradhan, Senior Scientist, is the PI, and Mr. Aditya Kumar, Scientist, Dr. S. M. Srivastava, Chief Technical Officer, are the Co-PIs. Progress of the project was

reviewed with Dr. P.K. Pradhan, Principal Investigator, who informed that there are 11 Pacu hatcheries in West Bengal supplying over 2 crore Pacu seed annually across the country; it takes three year to mature for breeding; also known as Rup Chand (Freshwater Pomfret) it is being farmed in Andhra Pradesh and is highly preferred by the consumers in U.P.; it is compatible with IMC and growth rate is on par with that of *Labeo rohita*. Further work is in progress and final recommendation will be provided after completion of the project.



*Pacu, *Piaractus brachypomus*, being sold at Gorakhpur Fish Market, one of the major fish markets in Uttar Pradesh*

NFDB funded another major research project entitled “*National Surveillance Programme for Aquatic Animal Diseases*”, a five year project for which Rs. 5.629 Crore was sanctioned to National Bureau of Fish Genetic Resources (ICAR-NBFGR), Lucknow. Dr. J.K. Jena, Deputy Director General (Fisheries science) is National Coordinator, Dr. Rehana Abidi, Director, NBFGR, Dr. Neeraj Sood, Principal Scientist, Dr. P. K. Pradhan, Senior Scientist, Dr. T. Raja Swaminathan, Senior Scientist, are engaged. In addition, there are 23 collaborating institutes across the country for which there are individual PI and Co-PIs.



Koi Carp showing necrotic changes in gills caused by Carp Edema Virus discovered by the diseases surveillance project investigators



Discussions were held with Dr. P.K. Pradhan, Co-PI, who informed that work is in progress and the project investigators discovered three new pathogens – two virus strains and one parasite.

(vii) Review of NFDB funded projects implemented by Dept. of Fisheries, Govt. of Uttar Pradesh

The following projects funded by NFDB were reviewed at the office of the Director of Fisheries:

1. Integrated approach on fish production enhancement & livelihood of local fishers in Ramgarh Taal, Gorakhpur – Amount sanctioned & released Rs. 7.512 lakh. Utilization certificate of Rs. 6.515 lakh received & Balance amount of Rs. 0.997 lakh pending, Progress report pending.
2. Establishment of 5 Government mini fish seed hatcheries – Amount sanctioned & released was Rs. 54.00 Lakh. UC & progress report is pending.
3. Fourth consecutive year stocking programme in 9 reservoirs – Amount sanctioned Rs. 64.75 lakh & released Rs. 32.3575 lakh. UC for 24.98 lakh received & Balance amount of Rs. 7.3775 lakh.
4. Development of community tank under Panchayat at Kakra, Rasoolpur, Soram & Salem villages under Muzaffarnagar district - Amount sanctioned Rs. 33.075 lakh & released Rs. 23.1525 lakh. Work is yet to start.
5. Establishment of ornamental fish hatchery unit by Sri Janab Aalam, Haziapur near Chungle Chowraha, Bareilly- Amount sanctioned Rs. 6.00 lakh & released Rs. 3.00 lakh. UC & progress report pending.
6. Setting up of Aquatic Animal Health & Environment Management Laboratory at Kathota Taal, Chinhath Training Centre, Lucknow- Amount sanctioned Rs. 40.00 lakh & released Rs. 20.00 lakh. UC & progress report pending.
7. Organization of Fish Festival at Lucknow by DoF, UP. Amount sanctioned and released was Rs. 18.00 lakh. Fish Festival yet to be conducted.
8. Renovation of 5 government fish seed rearing farms in an area of 6.8 ha. Amount sanctioned & released Rs. 9.24768 lakh. UC received & progress report pending.

Detailed discussions were held and it was requested to execute the works, submit utilization certificates and progress reports on the above mentioned NFDB assisted projects. The JDF while offering to do the needful conveyed that the Directorate would soon submit proposals to NFDB for Construction/ Renovation of Ponds, Fish Dressing Centers, Exposure Visits, Seminar/ Workshop.

(viii) Suggestions for further development of fisheries in Uttar Pradesh

Based on inspections and visits, the following suggestions are

made for fisheries development in Uttar Pradesh and proposals may be submitted by the Dept. of Fisheries, Govt. of Uttar Pradesh, as per NFDB guidelines:

- In U.P. about 90% ponds belong to Gram Panchayat, of which only 40% are utilized for fish farming. These ponds need to be renovated and to be leased to trained resource poor fisher community for scientific fish farming to increase fish production. Small reservoirs should be managed for culture cum capture fisheries by stocking with fingerlings. In-situ fish seed rearing practice in reservoirs need to be implemented in order to stock open water bodies to increase fish production. Pen/cage culture to be implemented in reservoirs wherever required.
- Lakes should be leased to fisher community for 10 years. In adjoining parts of the wetlands/ lakes rearing ponds to be constructed for fish seed rearing involving fisher community. Reared seed to be stocked in lakes for enhancing fish catch. In lakes resource-need based pens/cages should be established to rear fish seed to stock the lakes.
- Financial assistance to be provided to members of registered fishermen co-operative society to purchase fishing nets which is one of the means for their livelihood.
- Diversified fish species seed hatcheries/rearing units to be established. Demonstration sites of diversified fish species to be developed in collaboration of I.C.A.R. institutes in Government & private sector.
- Emphasis to be given to develop brood fish bank and certified fingerling production/fingerling bank. Fingerling, live food fish & brooder transportation system should be evolved.
- In water logged unproductive area new ponds to be constructed for scientific fish farming.
- *Pangasius* is one of the preferred fish by fish farmers because of its fast growth and high yield. Its culture practice needs to be implemented in controlled condition. *Pangasius* hatchery need to be developed for breeding and seed production in the State. To save *Pangasius* seed in winter months, cold mitigating mechanisms to be replicated in the region. Provision of solar energy operated water pumps need to be popularized in aquaculture.
- Genetically improved *Labeo rohita* culture should be demonstrated in the state and its seed to be produced in Govt. fish hatchery in U.P.
- On Oosar Land (alkaline soils) ponds should be constructed not only for water recharge, but also for fish farming to increase productivity. On such land flow-through system or re-circulatory system may be developed by resource rich entrepreneurs to enhance fish production in unit area.
- Ornamental fish farming required to be promoted in State by the small, medium, and large entrepreneurs.
- To reduce feed cost in aquaculture, integrated fish farming

(Live stock-fish, Poultry-fish, Duck-fish, Horti-agri-fish farming) need to be developed by the entrepreneurs in the State.

- Illegally introduced fish like *Clarias gariepinus*, Bighead Carp (*Hypophthalmichthys nobilis*) and Roop Chand *Piaractus brachypomus* are sold in the markets of the State. Investigation is needed to ascertain the merits and demerits of these species to prevent or allow the fish in culture system as well as in market, with due permission from Govt. of India.
- Use and abuse of pesticides and chemicals in aquaculture systems need to be investigated.
- Aqua-shops at district level need to be established where fish farming related inputs and outputs should be facilitated. Fish net weaving/ hooks/ line/ aquarium toys & other accessories may be promoted as small scale industry.
- Fish feed mill, wholesale/ retail market and retail fish outlets etc. may be established. Fish restaurant/ modern fish shop need to be established in different part of the State.
- Aquaculture Field Schools (AFSs) need to be established in different parts of the State to train rural fish farmers in their locality. In AFS educated & experienced progressive fish farmers may act as resource person and their fish farms to be used for demonstration. The progressive farmers who will be used as Master Trainers should be trained by the experts in specialized training programmes and exposure visit within and out of State.
- State may organize Matsya Melas/ Fish Festivals for creating awareness and popularization.
- Training and Exposure visits to fish farmers and fisheries departmental officers.

1.2 NFDB participates in 'Agri-Horti Tech Uttar Pradesh-2016' Exhibition at Lucknow, Uttar Pradesh

The 'International Agri-Horti Tech Uttar Pradesh – 2016' was organized from 28th to 30th January 2016 at Gyaneshwar Mishra Park, Lucknow, Uttar Pradesh. The exhibition was inaugurated by Shri Akhilesh Yadav, Hon'ble Chief Minister Uttar Pradesh. Officers from NFDB, Dr. Radheyshyam, Sr. Consultant (Fisheries), Dr. Raj Naresh Gopal, Sr. Executive (Tech) and Ms. K. Bhargavi, Executive Asst., put up the NFDB Stall which was inaugurated by Shri Rajneesh Gupta, Principal Secretary, Department of Animal Husbandary, Govt. of Uttar Pradesh. Numerous persons including fish farmers, entrepreneurs, stakeholders, fisheries officials, etc., visited the NFDB Stall. Brochures on NFDB Schemes were made available and technical information on the farming practices of *Pangasius* and Indian Major Carps, seed availability and reservoir stocking, cage culture practices, ornamental fishes, etc. was provided to the farmers and entrepreneurs.



Visitors at the NFDB Stall at the 'International Agri-Horti Tech Uttar Pradesh – 2016' at Lucknow

A Mobile Fish Retail Outlet, for which assistance was provided by NFDB to a beneficiary, was also put on display and a variety of ready to eat fish products were sold to the public.



Ready to eat fish products on sale at the NFDB funded Mobile Fish Retail Outlet at the 'International Agri-Horti Tech Uttar Pradesh – 2016' at Lucknow

1.3 NFDB funded fisheries projects sanctioned to Delhi, Haryana and Punjab States reviewed/inspected

Dr. Raj Naresh Gopal, Sr. Executive (Tech) and Shri P. Vijaya Kumar, Consultant (Fisheries), NFDB, undertook a review/ inspection of projects assisted by NFDB in the States of Delhi, Haryana and Punjab from 3rd to 6th February 2016 and discussed project-wise financial and physical progress with concerned officials/ beneficiaries.

(i) Review of NFDB funded projects implemented by FISHCOPFED, New Delhi

A review meeting was held with Shri B. K. Mishra, Managing Director, National Federation Of Fishermen's Cooperatives Ltd. (FISHCOPFED) on 3rd February 2016 at Krishi Bhawan, New

Delhi. Status of the projects being implemented by FISHCOPFED, for which financial assistance was provided by NFDB, was ascertained: (i) Organisation of Progressive Farmers into Co-operatives and Undertaking Capacity Building for which Rs. 57.36 lakh was sanctioned; (ii) Dry Fish Cluster Development in Paradeep, Odisha, for which Rs. 26.60 lakh was sanctioned; (iii) Training on Seed Rearing in Cages / Pens/ Ponds & Reservoir, for which Rs. 13.65 lakh was sanctioned.

(ii) Review of NFDB funded training programmes in the State of Haryana

NFDB sanctioned and released Rs. 2.4802 lakh to the Central Institute of Fisheries Education (ICAR-CIFE) Rohtak Center, Haryana, for training 60 farmers in 3 batches @ 20/batch for 05 days on 'Inland saline water aquaculture management practices and Community tank management for enhancing fish production' (Rs. 1.23 lakh) and Exposure Visit of 20 farmers to Andhra Pradesh for acquainting with various aspects of commercial shrimp farming (Rs. 1.2502 lakh). On 4th February 2016 implementation of the two programmes were reviewed with Dr. Hari Krishna, Scientist-in-charge, Dr. Pankaj Kumar and other Scientists and the training facilities were seen. It was informed that three training programmes were completed and the exposure visit is yet to be conducted.



At the Central Institute of Fisheries Education Rohtak Center campus in Haryana, with O-i-C Dr. Harikrishna (middle)

Very few proposals are received from the State of Haryana. With a view to exploring opportunities to support, NFDB Officials visited the District Fisheries Office-cum-Training Center along with Shri Ishwar Singh, ADF, Kurukshetra, to see the training facilities available such as training hall, audio visual equipment, demonstration pond, IMC hatchery, etc., where NFDB assisted training programmes are to be conducted.

Later, on 5th February 2016, Shri V.K. Singh, Deputy Director Fisheries, Shri Rajan, DFO, and other officials of Dept. of Fisheries, Govt. of Haryana, were met at their head office in Panchkula. During 2014-15 NFDB sanctioned and released: (a) Rs. 0.35482 lakh towards Exposure Visit cum short term Training Programme at CIFE, Kakinada, to 5 progressive farmers and one Dept. officer for 7 days; (b) Rs. 5.0 lakh for organizing Fish



Training Hall and other facilities at the Fish Culture Division, Dept. of Fisheries, Panchkula, Haryana

Festival by Dept. of Fisheries at Karnal district; and (c) Rs. 2.71625 lakh for Exposure Visit to 50 progressive farmers and 3 Dept. officers to Vijayawada, Nellore and a short term Training Programme at CIFE, Kakinada, for 7 days.



Meeting with Shri V.K. Singh, DDF and Shri Rajan, DFO, at Dept. of Fisheries, Panchkula, Haryana

(iii) Review of NFDB funded projects in the State of Punjab

On 5th February 2016 Integrated Ornamental Fishery Unit, at Kanouran, Mohali district, Punjab, owned by Shri Balwant Singh was visited. The estimated project cost was 15.93250 lakh; NFDB

sanctioned and released Rs 7.50 lakh (50% subsidy). The Unit was established on lease land of Fish Seed Farm of Dept. of Fisheries, Govt. of Punjab. The beneficiary constructed 34 cemented tanks for breeding and rearing of ornamental fishes. He showed different ornamental fishes like Koi Carp, Pink, Orange and Black Molley, Platy, Zebra Fish, Shark, etc., and informed that on an average his revenue was about Rs 30,000/- per month.



Integrated Ornamental Fishery Unit of Shri Balwant Singh at Kanouran, Mohali district, Punjab,

(iv) Inspection of sites proposed for Utilization of Saline and Waterlogged Soils for Aquaculture in the State of Punjab

On 6th February 2016 different fish farms/ ponds constructed on saline affected and waterlogged areas in Sri Muktsar Saheb district of Punjab were visited in connection with the proposed 'Project for saline affected and waterlogged areas of South-Western district of Punjab'.



Inspection of Ponds constructed on Saline and Waterlogged Soils in Sri Muktsar Saheb district of Punjab

1.4 Fish Feed Mill in Meghalaya Inaugurated

The Fish Feed Mill in Nongpoh, Ri-Bhoi district, Meghalaya, sponsored by Department of Fisheries, Meghalaya under

Meghalaya State Aquaculture Mission (MSAM) was commissioned by M/S M.G. Product and Infratech. The feed mill required some improvements and fine tuning which were duly carried out by the feed mill owner Shri M.G. Kharshanlor. The Fish Feed Mill has become fully operational and was inaugurated by Dr. C. Lyngdoh, MLA, Unsning, in the presence of Smt. I.R. Sangma, IAS, Director of Fisheries, Govt. of Meghalaya, on 29th January 2016.



Inauguration of Fish Feed Mill (above) and address by Dr. C. Lyngdoh (below) in Nongpoh, Ri-Bhoi district, Meghalaya

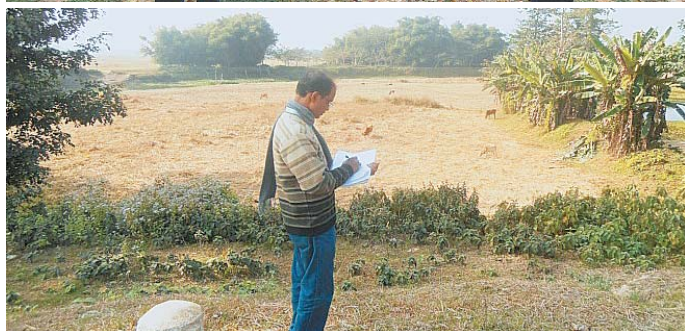
1.5 NFDB assisted project sites for Fish Seed Farm and New Fish Ponds in Tiwa Region of Assam inspected

During 2015-16 NFDB sanctioned Rs. 132 lakh (Rs. 46.50 lakhs for construction of 20 ha fish seed rearing farm and Rs. 85.50 lakh for construction of 80 ha new fish ponds and tanks by 80 farmers), and released 60 lakh as first installment to the Tiwa Autonomous Council (TAC), Morigaon district, Assam.

On 12th January 2016 Dr. B. Lahon, Sr. Consultant (Fisheries), Regional Centre NFDB Guwahati, inspected the sites of the proposed projects as well as status of the NFDB assisted projects undertaken by the Tiwa Autonomous Council earlier.

One of the proposals was to establish a 20.0 ha Fish Seed Rearing Farm at Luna Beel in TAC area. It is proposed to convert a dead channel of the river Sonai and the adjacent land into series of

tanks of 0.50 ha each for fish seed rearing. The site is just opposite to proposed Luna Beel Community Tank and near the Mahgrambora Community Tank and Charikonika Community Tank. Shri R.K. Deuri, Chief Executive Member (CEM), TAC, assured timely implementation of the scheme.



NFDB Sr. Consultant with officials inspecting earlier constructed Boghal Ghat Community Tank (above) and the proposed site for construction of Lunabeel Community Tank in Tiwa Autonomous Council (TAC) areas in Morigaon district, Assam

Eight sites identified for construction of 80 one-ha new ponds by 80 farmers, under the second project proposal, were also inspected. The sites were in low lying areas where very little paddy is grown and so the individual farmers desired to convert the land into ponds for fish culture.



NFDB Sr. Consultant with officials and beneficiaries at the proposed site for new pond construction in Tiwa Autonomous Council (TAC) areas in Morigaon district, Assam

1.6 NFDB assisted project sites for New Fish Ponds in Bodoland Region of Assam inspected

During 2015-16 NFDB sanctioned Rs. 129.60 lakh for construction of 120 new one-hectare ponds and tanks by 120 farmers and released Rs. 57.60 lakh as first installment to Bodoland Territorial Council (BTC), Kokrajhar district, Assam.

On 16th January 2016 Dr. R.Ch. Barman, Officer-in-Charge and Shri Abu Shamim Ahmed, Consultant, Regional Centre NFDB Guwahati, inspected the proposed project sites under State Specific Action Plan in Baksa district of Bodoland Territorial Council (BTC). Shri P. K. Hazarika, Nodal Officer, BTC and Shri Habel Mushahari, Chairman of the Nodal NGO – Aquaculture Development Organization for SC, ST and Backward Class, Assam, also accompanied.

The team visited Hatimura Beel in Baksa district where BTC Department has proposed for construction of New Govt. Community Ponds for the year 2015-16. A good number of community members were present during the visit. The team also visited some of the sites for construction of new pond under private sector and interacted with the beneficiaries.



Officials and local community people at the proposed site for construction of Govt. Ponds (above) and Pvt. Ponds (below) in Baksa district, Bodoland Territorial Council, Assam

From the field visit it was observed that the proposed Govt. and private areas as well as wetland areas are suitable for new pond construction. The BTC proposed to adopt a cluster based approach by incorporating all the components within a compact

area. During the trip the team also visited the ponds constructed during 2012-13 which were found to be satisfactory and all the farmers are continuing fish farming.



The team inspecting a Fish Pond constructed during 2012-13 with NFDB assistance in Baksa district, Assam

1.7 NFDB assisted Fisheries Development Project Sites in Nagaland inspected

NFDB sanctioned Rs. 1237.50 lakh to the Dept. of Fisheries, Govt. of Nagaland, and released Rs.866.25 lakh in three installments towards “Conservation and Promotion of Aquatic Species of Stream Fisheries and Enhancement of Fish Production”, and for “Development of Inland Fisheries and Aquaculture” in 11 districts of Nagaland; estimated project cost per district is Rs.150.00 lakh.

The basic objective of the Stream Fisheries Project was to preserve the endangered and indigenous aquatic species of the State by creating vast impoundment of water suitable for breeding and propagation by providing natural breeding and feeding ground for most of the natural stocks of the rivers/streams.

Dr. R. Ch. Barman, Officer-in-Charge and Dr. B. Lahon, Sr. Consultant (Fisheries), Regional Centre NFDB Guwahati, visited Nagaland from 17th to 25th January 2016. During the visit Shri Zenohol Angami, Director of Fisheries and Shri Neitho Kuotsu, Dy. Director of Fisheries, Nagaland were present. The visit to different sites were coordinated by Shri Rongsen Kumzuk, Assistant Director of Fisheries and accompanied by Miss Dory Yanthan, District Fishery Officer (DFO) Peren, Shri Imtisunep, DFO Mokokchung, Shri Tatong Longchar, DFO Mon, Shri Yhunsenlo Kent, DFO Phek, Shri Rushulo Kent, SDFO Longleng, Shri Mayanger, Junior Engineer and Shri Imti Merem, Section Officer of the Dept. of Fisheries.

The State of Nagaland has numbers of limitations: hilly terrain, poor road conditions, poor awareness and motivation and shortage of technical manpower, etc. The Dept. of Fisheries has however completed seven projects out of the eleven projects sanctioned by NFDB till date. They propose to complete the remaining four projects before the rainy season. The team inspected Stream Fisheries projects in seven districts: Peren, Mokokchung, Longleng, Mon, Wokha, Kohima and Phek district.



Inspecting team at the Stream Fishery Project site in Peren district (above) and Phek district (below), Nagaland

The team also visited a few potential locations at Urura village of Dimapur district where construction of new ponds by individual beneficiaries is proposed by the Department. The sites are mostly low-lying paddy fields and rice production is very poor due to the soil condition. The Govt. of Nagaland has declared Urura village as Fishery Model Village due to its fishery potential and farmers' interest in fisheries. Proposed sites are suitable for construction of tanks for fish culture. The entire Dimapur district has plain land like in Assam, and hence there is huge potential for development of culture based fishery in the district.



Inspecting team at one of the sites proposed for construction of new fish ponds in Urura village, Dimapur district, Nagaland

After completion of the field visits, the team met Mrs. B.P. Chetri, Commissioner and Secretary of Fisheries, Nagaland, Shri Shetoyl Sumi, Hon'ble Minister of Fisheries, and discussed about the observations made during the visits.

1.8 NFDB participates in Third Assam International Agri-Horti Show- 2016 at Guwahati, Assam

The 3rd Assam International Agri-Horticultural Show - 2016 was organized by the State Department of Agriculture, in association with the Indian Chamber of Commerce and the Assam Agricultural University. It was held at the College of Veterinary Science playground at Khanapara, Guwahati from 6th to 9th January 2016. Shri Tarun Gogoi, Hon'ble Chief Minister of Assam, inaugurated the Show in the presence of Shri Rakibul Hussain, Hon'ble Minister of Agriculture and other dignitaries.



Inaugural function and audience at the 3rd Assam International Agri-Horticulture Show-2016, at Guwahati

Depts. of Agriculture and Horticulture of the Northeastern and other States in the country, a few Banks and private companies related to agriculture, and countries such as Canada, China Nepal, Italy, Indonesia, Poland, Bhutan, etc., participated. A variety of technologies, innovations, developments, including organic farming, in the Agri-Horti and allied sectors were showcased to the visiting farmers, entrepreneurs and women.



NFDB Stall at the 3rd Assam International Agri-Horticulture Show-2016, at Guwahati

Dr. R. Ch. Barman, Officer-in-Charge, Dr. B. Lahon, Sr. Consultant (Fisheries), Shri A. S. Ahmed, Consultant (Fisheries), NFDB, Regional Centre, Guwahati, put up the NFDB Stall. NFDB brochures and application form 'Matsya Samridhi' were distributed among the visitors. Shri Hemanta Narzary, IAS, Principal Secretary to the Govt. of Assam, Department of Fisheries, visited NFDB Stall and interacted with NFDB officials on various aspects of fisheries development in the State. During the technical session, Dr. R.Ch. Barman delivered a presentation on NFDB initiatives for fisheries development in Northeast India.

1.9 NFDB participates in Rongali - 2016 at Guwahati, Assam

'Rongali - 2016' was organized from 29th - 31st January 2016 at Sonaram Field, riverfront of Brahmaputra, Guwahati, to showcase various facets of culture of Assam and North East. Trend MMS Trust of Assam, Hotel & Restaurants Association of Assam, Assam Tourism, Dept. of Cultural Affairs, Government of Assam and Ministry of Youth Affairs, Government of India, participated.

During 'Rongali - 2016' a dedicated Agri-Horti Exhibition was also organized to highlight various Agri-Horti products of Assam where many Depts. of State and Central Govts. participated. Shri Radha Mohan Singh, Hon'ble Union Minister for Agriculture, Govt. of India, Smt. Bijoya Chakravarty, Member of Parliament, Assam, visited the NFDB stall and interacted with officials on different initiatives and activities of NFDB in Northeast. Brochures on "NFDB Schemes for Northeast States" and NFDB application form 'Matsya Samridhi' were distributed among the visitors.



Shri Radha Mohan Singh, Hon'ble Union Minister for Agriculture, Govt. of India, and Smt. Bijoya Chakravarty, Member of Parliament, Assam, at the NFDB Stall at 'Rongali - 2016' at Guwahati, Assam

The Dept. of Zoology, Gauhati University also participated in the event and showcased the NFDB assisted Integrated Ornamental Fishery Scheme being operated in the University. Ornamental fish *Channa barca*, *Channa bleheri*, *Channa orantimaculata*, *Bedis bedis*, *Hara hara*, *Danio spp.* etc., put on display were a major point of attraction in NFDB stall.



Channa bleheri Vierke, 1991, on display at NFDB Stall during Rongali - 2016, at Guwahati, Assam

1.10 NFDB participates in 'Vibrant Northeast - 2016' at Guwahati, Assam

Vibrant North East - 2016 was jointly organized by the Centre for Agriculture and Rural Development (CARD) and the Associated Chamber of Commerce and Industry of India and supported by Ministry of Development of Northeastern Region and Ministry of Food Processing Industries, Government of India, at Veterinary College Playground, Khanapara, Guwahati, Assam from 18th to 20th February 2016.

Smt. Harsimrat Kaur Badal, Honb'le Union Minister for Food Processing Industries, Govt. of India inaugurated the 'Vibrant Northeast - 2016' Summit and Exhibition. Smt. Badal urged the entrepreneurs to come forward to set up food processing industries in the North Eastern and make use of financial assistance provided by the Government which will usher in a new era of higher income to farmers, employment generation to the youth of this region as well as help in creating necessary infrastructure for the North-Eastern Region.

NFDB Regional Centre, Guwahati, set up a Stall and explained about the activities and schemes and distributed brochures on 'NFDB Schemes for Northeast States' and NFDB application form '*Matsya Samridhi*' to the visitors. Dr. R. Ch. Barman, Officer-in-Charge gave a briefing about NFDB to Door Darshan TV, Northeast Kendra.



Visitors interacting with officials at the NFDB Stall at Agri-Horti Exhibition during 'Vibrant Northeast - 2016' at Guwahati, Assam

1.11 NFDB participates in Make in India Conclave organized by NIRD-NERC, Guwahati, Assam

National Institute of Rural Development and Panchayati Raj, Northeast Regional Centre (NIRDPR-NERC), Khanapara, Guwahati in collaboration with Indian Institute of Entrepreneurship (IIE) organized a two-day seminar cum exhibition on 'Make in India, Startup India and Standup India' at its campus in Khanapara, Guwahati from 25th - 26th February 2016.

Dr. G. Baruah, Mentor Director, Indian Institute of Information Technology (IIIT), Guwahati was the Chief Guest, Dr. A. Misra,

Director, Assam Science Technology & Environment Council (ASTEC) and Shri M. K. Das, Director, Indian Institute of Entrepreneurship (IIE), Guwahati, were Guests of Honour; Dr. R. M. Pant, Director, NIRDPR-NERC, Guwahati and other dignitaries were present.



Inaugural function of 'Make in India, Startup India and Standup India' at NIRDPR-NERC campus in Khanapara, Guwahati, Assam

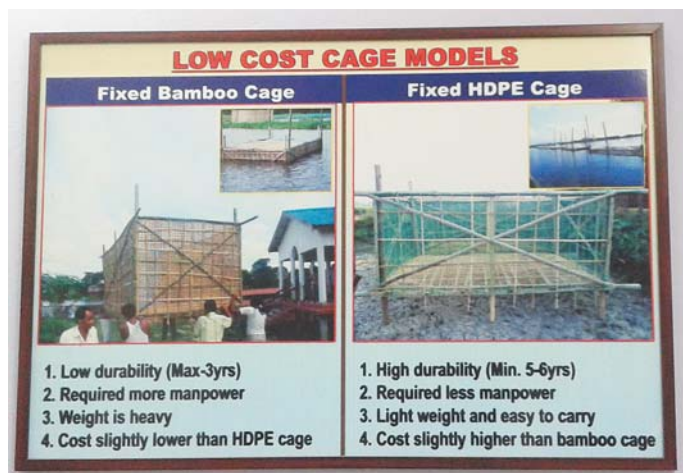
A series of seminars on 'Make in India and Rural Northeast: The Challenges' were held on both the days. The exhibition on 'Make in India, Startup India and Standup India' was also organized and the theme of the exhibition was to showcase the unique and potential village industry products along with technologies from the Northeastern Region. Twenty seven different institutions, organizations, SHGs, etc., participated; under the Innovators Forum, Don Bosco University, Guwahati, Royal Group of Institutions, Guwahati, Hindusthan Kendriya Vidyalaya, Guwahati, and three Independent Innovators also participated in the Exhibition and displayed their products.



An exhibition showcasing the unique village industry products and technologies from the Northeastern Region arranged as part of the 'Make in India, Startup India and Standup India' event at NIRDPR-NERC, Khanapara, Guwahati, Assam

Dr. R. Ch. Barman, Officer-in-Charge, Dr. B. Lahon, Sr. Consultant (Fisheries), Shri A. S. Ahmed, Consultant (Fisheries), NFDB, Regional Centre, Guwahati, put up the NFDB Stall in which the innovative low-cost cage models with HDPE material

replacing the bamboo screen was also displayed. Brochures on 'NFDB Schemes for Northeast States' and NFDB application form 'Matshya Samridhi' were distributed to the visitors.



An exhibit showing innovative Low-cost Cage models with HDPE material replacing the bamboo screen and its advantages

1.12 NFDB assisted Fish Fingerling Stocking for second year undertaken in Loktak Lake, Manipur

NFDB sanctioned an amount of Rs. 25.00 Lakh and released Rs. 12.50 lakh during 2015-16 as 1st installment toward the cost of fish fingerling stocking for 2nd year in Loktak Lake, by the Dept. of Fisheries, Govt. of Manipur. Dept. has scheduled stocking of fish fingerlings in a phase manner; in the 1st phase, fingerlings were released at four different locations of the Lake. The inauguration programme of stocking was conducted on 21st March 2016 at Sendra point where Shri David K. Shimray, Director of Fisheries, local leaders, members of NGOs, Officials of Dept. of Fisheries, Manipur, representatives from Loktak Development



Shri David K. Shimray, Director of Fisheries, Manipur, releasing fish fingerlings into the Loktak Lake from a boat at Sendra Point on 21st March 2016

Authority (LDA), Manipur, Dr. R.Ch. Barman, Officer-in-Charge and Senior Executive (Tech.), Regional Centre of NFDB, Guwahati, Assam were present. During the programme 5.0 lakh fingerlings of Indian Major Carps (IMC) were released. As per schedule, the next phase of stocking was carried out at Ithing point on 31st March 2016; at Thanga Chinglak Point on 4th and lastly at Thanga Haoreng Chingyang Point on 12th April 2016.

1.13 NFDB assisted Community Project in Srijangram Block, Bongaigaon district, Assam, inspected

NFDB sanctioned Rs. 13.0810 lakh and released Rs. 8.39350 lakh as 1st installment for training, exposure visit, demonstration and intervention cost of the project entitled 'Community Fish Seed Bank and Seed Rearing in Srijangram Development Block, Bongaigaon, Assam. The project aims to leverage livelihoods of small-scale aquaculturists, and is being implemented by Centrally Sponsored Scheme – Agricultural Technology Management Agency (CSS-ATMA), Bongaigaon, Assam.

Mr. A.S. Ahmed (Consultant) and Mr. S. Baishya (Jr. Consultant), Regional Centre, NFDB, Guwahati made a field visit on 28th March 2014, accompanied by officials from CSS-ATMA viz., Shri Chayyan Acharjee, District Fishery Development Officer, Bongaigaon, Dr. Anupam Sharma, Fishery Extension Officer, and BTT Member, Srijangram Development Block, Bongaigaon, Assam. Seven SHG's were visited and their renovated ponds, seed stocking, rearing, etc., were monitored.



Officials inspecting Amur Carp reared at Bolbom SHG Pond in Kakoijana village, Bongaigaon district, Lower Assam

As part of the project, demonstration and intervention activities of rearing of Jayanti Rohu and Amur Carp were undertaken in the farmers' ponds. Growth of Jayanti Rohu and Amur Carp was found to be satisfactory. The beneficiaries had undergone training and exposure visits which were organized both within and outside the State. The farmers were confident and indicated that they would undertake the activities this year also.



Officials inspecting Jayanti Rohu reared at pond of Progotisil Meen Palon Gut, (Community Fish Seed Bank) in Srijangram Development Block, Bongaigaon district, Lower Assam

1.14 NFDB funded fisheries projects in West Bengal, Assam and Meghalaya reviewed for progress and to identify further needs of the States

Shri G. Vijaya Lazarus, Senior Executive (Infra-Tech) and Shri Chandan Chetri, Senior Executive (Tech), NFDB, undertook an inspection of the NFDB funded project sites in the States of West Bengal, Assam and Meghalaya from 1st to 5th March 2016.

(i) Development of Wetlands in West Bengal reviewed

NFDB funded a project for the development of Wetlands in North 24-Parganas district of West Bengal. Discussions were held with Managing Director, BENFISH and Director of Fisheries, West Bengal, and the wetland sites were inspected. Some of the ponds constructed on the wetlands were found to be infested with aquatic weeds which need to be cleared. It was observed that dykes were eroded and need to be strengthened. Further it was noticed that the NFDB funded four-wheeler meant for transportation of fish is lying idle at wet lands and suggestions were given for putting it to effective use.



NFDB official interacting with beneficiary fish farmers at their ponds constructed on wetlands in Nalban, East 24-Parganas district, West Bengal

(ii) Construction of new ponds in Bodoland, Assam, reviewed

NFDB funded a project on construction of new ponds in Udalguri district of Bodoland, Assam. The ponds were ready and the beneficiaries were preparing the ponds for the next crop.



Fish ponds constructed with NFDB assistance in Kalaigaon, Udalguri district, Bodoland, Assam

It was observed that fish were being sold on the road side, and in view of the huge demand for fish there is good scope for constructing small hygienic fish market with 10 stalls, and the Nodal Officer of the Dept. of Fisheries offered to submit a suitable proposal to NFDB for financial assistance.

(iii) Wholesale Fish Market at Mangaldai, Darang district, Assam, inspected

Construction of the NFDB assisted Wholesale Fish Market at Mangaldai in Darang district of Assam is completed and is ready for occupation by the allotted fish vendors. The workmanship is observed to be good. However, surface hardening of parking area, compound wall and effluent treatment plant were not

proposed in the initial proposal. When suggested, the Director of Fisheries offered to submit proposals accordingly under the second phase of development of the fish market.



NFDB assisted Wholesale Fish Market newly constructed at Mangaldai in Darang district of Assam

(iv) Sites near Guwahati inspected for new and innovative proposals

The Daily Fish Market at Uzanbazar on the banks of River Brahmaputra, near Guwahati, was inspected. Vendors were selling fish in temporary sheds. There is scope for construction of a small Retail Fish Market with 15 stalls. The Executive Engineer of the Dept. of Fisheries was asked to explore the possibilities and submit suitable proposals to NFDB.



Daily Fish market at Uzanbazar, on the banks of River Brahmaputra, near Guwahati, Assam

The Assasm Matsya Vikash Sarovar, which is located in the heart of Guwahati city and under the control of Dept. of Fisheries, was visited. Seeing the potential, it was suggested to come up with an innovative proposal of Marketing Live Fish by renovating the Sarovar (lake) and installing small cages in it to hold live fish.



Assasm Matsya Vikash Sarovar, located in the heart of Guwahati city, suitable for Live Fish Marketing

(v) Wholesale Fish Market at Sulung, Nagaon district, Assam, inspected

Construction of the NFDB assisted Wholesale Fish Market at Sulung in Nagaon district of Assam is completed and allotted to fish vendors. On inspection it was observed that the market is functioning well and a power generator is also installed. However, effluent treatment plant, compound wall with gate and parking area are lacking and the Director of Fisheries informed that they would be proposed in the second phase of development.



NFDB assisted Wholesale Fish Market at Sulung in Nagaon district, Assam: outside view (above) and inside view (below)

Right in front of the new fish market, the old fish market under a shed is also being used especially in the morning hours due to heavy rush.



The old fish market at Sulung being still used during morning rush hours

(vi) Construction of Wholesale Fish Market at Tezpur, Assam, inspected

Progress of construction work on the NFDB assisted Wholesale Fish Market at Tezpur, in Sonitpur district of Assam, was reviewed. It was observed that the progress of work is slow and there appears to be cost escalation. NFDB officials were informed that the site of construction was tank bed and hence the foundation cost was higher than proposed and further the local body had not laid the approach road. The Director of Fisheries agreed to look into the matter and hasten up the process.



Construction work on the NFDB assisted Wholesale Fish Market at Tezpur, in Sonitpur district of Assam

(vii) Site allotted for proposed Fish Market in Nongpoh, Meghalaya inspected

The Directorate of Fisheries, Govt. of Meghalaya, submitted a proposal to NFDB for the construction of a Fish Market at Nongpoh, which was duly sanctioned. Shri G. Vijaya Lazarus, Senior Executive (Infra-Tech) and Shri Chandan Chetri, Senior Executive (Tech), NFDB, Hyderabad, and Dr. R.Ch. Barman, Officer-in-Charge, Regional Centre, NFDB, Guwahati, undertook an inspection of the site allotted for the fish market. Later, they held discussions with Mrs. I.R. Sangma, Director of Fisheries, Govt. of Meghalaya, and other officials, at Shillong. It was informed that the site has been handed over and tendering of the construction work was in progress.



Site allotted for retail market at Nongpoh (above) and NFDB Officials interacting with Mrs. I.R. Sangma, Director of Fisheries, Govt. of Meghalaya, at Shillong (below)

(viii) Progress of construction work on Fish Seed Hatchery at Raha, Assam, reviewed

NFDB provided assistance for construction of an additional Fish Seed Hatchery Unit at the J.B. Garh Fish Farm at Raha, Nagaon district, Assam. The progress of work was inspected by the NFDB Officials. The farm belongs to Dept. of Fisheries, Govt. of Assam; total land area of the farm is 43.63 ha and the total water spread area is 20.30 ha. There are sufficient numbers of nursery and rearing tanks as well as brood stock ponds. It is one of the major fish seed producing farms in central Assam. However, it is not able to meet the demand of fish seed as there is only one hatchery unit, and it was highly essential to construct another hatchery for

increasing seed production. It was informed that about 14.20 crores spawn was produced last year and that they are targeting 20 crores (5.8 crores more) spawn this year with the additional infrastructure created through NFDB funding. The hatchery is completed and ready for use this breeding season.



NFDB funded Fish Seed Hatchery at J.B. Garh Fish Seed Farm at Raha, Nagaon district, Assam

(ix) Progress of construction work on Fish Seed Hatchery at Tezpur, Assam, reviewed

NFDB provided assistance for construction of an additional Fish Seed Hatchery Unit at Hazara Fish Seed Farm at Tezpur, Sonitpur district, Assam. The progress of work was inspected. The farm belongs to the Dept. of Fisheries, Govt. of Assam; total land area

of the farm is 31.80 ha and water spread area 18.50 ha. It has sufficient numbers of nursery and rearing tanks as well as brood stock ponds. Construction of the new hatchery unit is completed and the infrastructure will be put to use this breeding season. The existing hatchery has produced about 5-6 cores of spawn last season and the new hatchery unit will give another additional 4-5 crores of spawn this year which would meet the fish seed requirement of farms along the north bank of Brahmaputra to a certain extent. Considering the area and infrastructure at the J.B. Garh Fish Seed Farm and Hazara Fish Seed Farm, it can be planned for development of these farms as State Brood Banks.



NFDB funded Fish Seed Hatchery at Hazara Fish Seed Farm at Tezpur, Sonitpur district, Assam

2. Farmers' Note Book

2.1 Lesser Known Freshwater Fish with Good Economic Potential

India possesses several medium and minor indigenous fish species that have high regional demand and often considered as delicacies by the gourmets. Under the head 'Lesser Known Freshwater Fish with Good Economic Potential', 20 species of freshwater fishes were enlisted in the July-August 2015 issue of 'Matsya Bharat' (page 12). General information on the Striped Murrel *Channa striata* (Bloch, 1793), the Spiny Eel *Mastacembelus armatus* (Lacepède, 1800) and Climbing Perch *Anabas testudineus* (Bloch, 1792) was provided in the previous three issues. In this issue some general information about the fish popularly called 'Mola' is being presented.

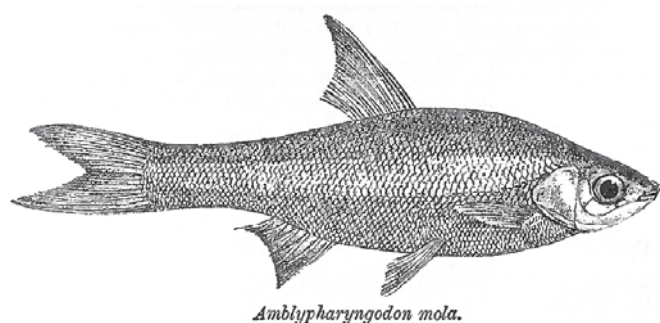
Amblypharyngodon mola (Hamilton, 1822)

Common Name

Mola carplet

Vernacular Names

Assamese:	Moah, Mowa
Bengali:	Mourala, Mowka
Bihari:	Dhawai
English:	Mola Carplet
Hindi:	Dhawai
Kannada:	Enapu, Enapu-pakke
Malayalam:	Oolari
Manipuri:	—
Oriya:	—
Tamil:	Oori
Telugu:	Pakkelu



Amblypharyngodon mola.

Description

Body fusiform/ spindle-shaped, deep and compressed; golden reddish to pale yellow with a broad silvery lateral band. Fin Rays: Dorsal – 8, Anal – 6-7, Pectoral – 13-15, Pelvic – 8 and Caudal 19. The genus name is derived from dark pharyngeal teeth the fish posses. There are five recognized species of *Amblypharyngodon*; the Mola Carplet *A. mola* (Hamilton, 1822)



Mola Carplet Amblypharyngodon mola (Hamilton, 1822): Female (above) and Male (below)

and the Indian Carplet *A. microlepis* (Bleeker, 1854) are common in India. The diploid number of chromosomes reported in Mola Carplet is 50 or 52.

Mola carplet is very rich in Vitamin A, Iron, Zinc and other micro nutrients; it is considered a highly nutritious diet for children and women. The relative abundance of some of the micronutrients is as follows:

	Vitamin A (RAE)	Calcium (mg)	Iron (mg)	Zinc (mg)
<i>Mola fish</i> ²	2680	0.9	5.7	3.2
<i>Darkina fish</i> ³	890	0.8	12.0	4.0
Egg (cooked)	96	32	0.8	0.7
Chicken (cooked)	20	6	0.5	0.8
Beef (cooked)	3	11	11	2.6

Habit & Habitat

A. mola occurs in ponds, streams, canals, paddy fields, etc. It is omnivorous; prefers phytoplankton and plant matter; accepts formulated pellet feeds.

Size & Weight

Usually up to 10 cm, maximum length recorded 20 cm; maximum weight recorded 50 g.

Breeding & Life Cycle

Length at first maturity 40-45 cm in males and 46-50 cm in females. Fecundity (number of eggs in ovary) ranges from 485 in a 5.5 cm and 1.5 g fish to 15,786 in a 9.1 cm and 9.7 g fish. It is a fractional spawner; breeds three times a year; spawns around 500 eggs each time. It breeds naturally in ponds.

Distribution

Widespread in Southeast Asia; reported from Myanmar, India, Bangladesh, Pakistan, and Afghanistan.

Fisheries & Aquaculture

Small indigenous fish species (SIS) contribute significantly to the diet of poor households. Mola Carplet is commercially important and one of the most sought after food fishes especially in Northeastern States, West Bengal and Bangladesh. It has a high nutritional value and very good flavor; it fetches a high price of up to Rs. 400/- per kg. It has been successfully bred in captivity. There is now an increasing trend to culture small indigenous fish that are consumed whole. Attempts have been made to culture *Amblypharyngodon mola* in ponds under monoculture as well as polyculture with other Carps, although on a subsistence scale. Mola carplet is also marketed live as an Ornamental Fish.

[Source: www.fishbase.org; A.G.K. Menon, 1999; R. Gogoi & U.C. Goswami, 2015; Amalgamated Plantations Pvt. Ltd. (APPL): Aquaculture, Assam; R.Ch. Barman, Regional Centre, NFDB, Guwahati, Assam]

2.2 Indigenous Ornamental Fish from Upper Brahmaputra Basin Bred Successfully

NFDB funded a project entitled 'Germplasm Inventorization, Brood Stocking and Captive Breeding of Ornamental Fish Species of the Upper Brahmaputra Basin' to Prof. S.P. Biswas, Principal Investigator, Life Sciences Department, Dibrugarh University. NFDB released an amount of Rs. 42,97,860 to the Dibrugarh University, Dibrugarh district, Assam, to develop a dedicated facility in the region for this purpose. The project commenced on 23rd April 2013 with the following objectives: (i) Establishment of a live gene bank for indigenous ornamental fish species of the Brahmaputra Basin; (ii) Standardization of captive breeding method cum larval rearing of rare and endemic ornamental fish species; (iii) To train the local youths for rearing and breeding of aquarium fish.



Facilities developed under NFDB assisted Ornamental Fish Project at Dibrugarh University, Assam

During the period of the project various indigenous ornamental fishes were collected and kept in Aquarium House. Several breeding trials with two endemic species viz., *Channa aurantimaculata* and *Mystus dibrugarensis* were successfully



Mystus dibrugarensis: brood fish used and fingerlings produced

done by using Ovaprim. Along with the breeding, hatching and rearing of larvae and fry was also carried out.

A workshop and training programme were conducted to develop awareness among youths. One-day Workshop on Ornamental Fish Species was conducted at Sibsagar Girls' College, Sivasagar on 23rd February 2014. Thirty youth, entrepreneur, students and researches participated. Another Three-day Training Camp on Indigenous Ornamental Fish Species was conducted at Goalpara from 26th to 28th July 2014. Forty participants including fish farmers, entrepreneurs and Woman Self Help Groups (SHGs) of Goalpara and Bongaigaon districts of lower Assam attended the training camp. The trainings included lecturers, practical demonstration, group discussion, field visit to local breeding unit under Krishnai block. In both the workshop and training camp, District Fishery Developmental Officer (DFDO) and other dignitaries of respective districts were present.

2.3 Success Stories of Innovative Fish Farmers of Uttar Pradesh

(2.3.1) Innovative model of Recirculatory Cement Tank System enhances *Pangasius* production in underproductive saline soils in Barabanki district of Uttar Pradesh

Some of the district of Uttar Pradesh, Punjab and Haryana have unproductive or under productive saline soils. The productivity of such saline soils can be enhanced by constructing ponds and storing rain water to recharge the soil. In these ponds fish culture can be carried out. However, fish production is reported to be low. Therefore, an innovative model of re-circulatory system has been developed by farmers in Barabanki district of Uttar Pradesh with technical guidance from ICAR-NBFGR, Lucknow, to enhance fish production many times on such saline tracts. The nutrient rich waste waters from the tanks may be used for increasing productivity of adjacent saline lands.

Shri Shahnawazul Haque Khan and Shri Parvez Khan were doing fish farming in 10 private leased ponds, including *Pangasius* culture. After completion of lease period, farmers purchased 0.6 ha underproductive alkaline soil base land in Nilgri village, Jahangirabad Block, Barabanki district, U.P. They constructed a settling tank in 0.08 ha and in 0.132 ha 38 cemented tanks of 7.2 m x 6.6 m having 1.5 m depth were constructed in two rows for intensive *Pangasius* grow out farming.



A view of Pangasius grow-out cemented tanks re-circulatory system with centrally placed iron frame and water supply at Nilgri village, Jahangirabad, Barabanki district, U.P.

Mr. Parvez Khan undertook a trial of *Pangasius* grow-out culture in re-circulatory system. Tanks were provided with 10 cm dia plastic pipes for water supply. Ground water was used for filling the cemented tanks. Iron frame was provided on the marginal portion of the central walls for ease of people movement for feeding fish, harvesting, etc. Each tank was cleaned and filled with ground water to 4 ft depth. *Pangasius* seed of 0.33 g each was purchased from West Bengal and reared in small earthen pond for one month to 3-5 g fingerlings. These acclimatized fingerlings were stocked in cemented tanks @ 6000/ tank. Commercial feed fortified with toxin binder, mineral mixture, yeast, lysine, methionine, Vitamin E & C, spraying soya oil and mixing for 5 minute using machine. Fish were fed twice a day. Periodically ammonia, D.O. and pH were monitored and 30% water was exchanged. Fish were cultured for 5-6 month. *Pangasius* grew to 400-600g with the production rate of 5 kg/m³. Fish production per tank was 356.4 kg. FCR was 1.3-1.5. Fish were sold at Rs. 95-110/kg at farm gate.



Dr. Radheyshyam, Sr. consultant, NFDB, interacting with fish farmer Mr. Parvez Khan



A haul of Pangasius fish from a cemented tank at Nilgri village, Jahangirabad, Barabanki district, U.P.

To mitigate the effect of cold in winter months by thermal manipulation, Mr. Parvez Khan converted a series of 16 cemented tanks into a poly house using iron frame and plastic sheets. With the provision of poly-sheet covering over the cemented tanks water temperature in each tank increased by 6 °C compared to outside temperature. When only ground water was supplied the water temperature increased by 3-4 °C. The cumulative effects of ground water supply and poly sheet covering was water temperature becoming conducive for *Pangasius* survival during winter months. The unutilized fish feeds along with fish metabolites were removed through the outlets and diverted into settling tank by drainage channel. After few days, the clear water from settling tank was recycled into the cemented tanks culture system. At times, waste water was also used for recharging the soil and settled residue was drained out on to adjoining agriculture field. Solid sediment from the settling tanks was dried and used as manure in agriculture/horticulture. The fish farmers made a net profit of Rs 30 lakh from just 0.6 ha area by expending Rs 60 lakh annually. They employed 9 people by paying Rs.7,000 per month.



Inside view of poly-house for Pangasius grow-out in cemented re-circulatory system with centrally placed iron frame and water supply at Nilgri village, Jahangirabad, Barabanki district, U.P.

Suggestion:

Dr. Radheyshyam, Sr. Consultant (Fisheries), NFDB, who had inspected the farm, offered the following suggestions:

- (i) Installation of bio-filter will improve the water quality in re-circulatory *Pangasius* grow-out culture system.
- (ii) Quality of nutrient rich waste water from culture system may be improved by developing Aquaponic infrastructure adjacent to cemented tanks grow-out system.
- (iii) Such model need to be replicated by the resource rich entrepreneurs on saline tracts of Uttar Pradesh, Haryana and Punjab in order to enhance fish production by utilizing underproductive soil of the region.

(2.3.2) Indigenously developed technique protects *Pangasius* seed from low temperatures in earthen ponds during winter months in Siswa Bazar, Maharajganj district, Uttar Pradesh

Availability of adequate quantity of quality *Pangasius* seed is one of the major constraints in Uttar Pradesh. Added to that, survival of *Pangasius* seed during winter months is a major problem. Dr. Sajay Kumar Srivastava of Siswa Bazar, Maharajganj district, U.P (near Nepal Border) is a progressive fish farmer who had received financial assistance for construction of ponds under Intensive Aquaculture Project of NFDB. The farm was inspected by Dr. Radheyshyam, Sr. Consultant (Fisheries), NFDB.



*Fish farmer Dr. Sanjay Kumar Srivastava who developed indigenous technique using thermocole boxes and polythene sheet for protecting *Pangasius* seed from low winter temperatures in earthen pond in Siswa Bazar, Maharajganj district, Uttar Pradesh*

Dr. Sajay Kumar Srivastava developed an indigenous technique on a 0.2 ha earthen pond to save *Pangasius* fingerlings during winter months. Pond was prepared and several bamboo poles were fixed in the mid part of the pond to erect a framework over the pond. On the pond embankments strong bamboo pegs were fixed. Nylon ropes were firmly tied with help of centrally fixed bamboo pole and fixed bamboo pegs on the pond embankments. Several cubical thermocole boxes were placed over the pond water surface in floating condition. About 20 bundles of polythene sheets (100 x 80 ft each bundle) were spread over the nylon rope framework and tightened firmly. The thermocole boxes do not allow the nylon framework as well as polythene sheet to touch

water surface. Polythene sheet was further fastened with the help of nylon rope from above.



Indigenous technique developed using polythene sheet laid over a framework of thermocole boxes and nylon ropes on 0.2 ha earthen pond in Siswa Bazar, Maharajganj, Uttar Pradesh

Dr. Sanjay Kumar purchased *Pangasius* seed (average wt. 0.4 g) from West Bengal @ Rs. 1.25/fry and stocked 3.25 lakh of them in the well prepared 0.2 ha rearing pond (stocking rate @ 16.25 lakh/ ha) in the month of November. Fish were fed with protein rich commercial formulated fish feed twice daily. Every day ground water was added to the pond so as to increase water temperature. Solar energy operated pump was used for ground water supply. However on cloudy and foggy days a 5 HP diesel pump set was used to draw ground water into the pond. Periodically, about 30% pond-water was exchanged with fresh ground water so as to reduce metabolites load in the rearing pond. In about 4 month fingerlings grew to average weight of 50 g. Total 2.925 lakh fingerlings were harvested and sold @ Rs. 8/ fingerling. Farmer has also supplied quality *Pangasius* fingerlings to his fellow farmers in the region.



Pangasius fingerlings reared during winter months in earthen pond using indigenous technique for protecting from low temperature in Siswa Bazar, Maharajganj district, Uttar Pradesh

This innovative device prevents falling of extremely cool dewdrops into the pond water during winter months. It also helps in preventing transfer of heat from pond water into air. At extremely low temperature fog used to form on pond water surface. This in turn reduces water temperature over the pond surface. By covering with the polythene sheet pond water heat is not emitted into outside environment. The cumulative effect of ground water addition and plastic sheet covering made the pond water temperature conducive for survival of *Pangasius* seed during winter months in this region.

2.4 Success Stories of Innovative and Progressive Fish Farmers of Bihar

(2.4.1) Indigenous cold-mitigating mechanism to save *Pangasius* seed in cemented tanks during winter months in Siwan district of Bihar

Timely availability of adequate quantity of quality fish seed is a pre-requisite for the development of aquaculture. In North parts of Uttar Pradesh and Bihar the *Pangasius* is one of the most preferred fish by fish farmers because of its fast growth and high level of production in unit area. This exerts pressure on *Pangasius* seed supply in the region during March & April. Since *Pangasius* seed do not survive at extremely low temperature, fish farmers are compelled to purchase seed from West Bengal even at a higher price irrespective of fish seed quality and health. In order to rear *Pangasius* seed in colder months, Shri Mazaharul Haque (58 years) had developed an “Indigenous cold mitigating mechanism to save *Pangasius* seed in cemented tanks during winter months” in Nautan village, P.O. Gohpur Bazarahia, P.S. G.B.Nagar Taruwara in Siwan district, Bihar. Formerly, Mr. Haque was working as a refinery technician in Saudi Arab & Sudan. After attaining 50 years age he was forced to return to his native place Siwan, Bihar, in 2011. He owns 2.4 ha land and one parental pond. In 2013, he contacted DoF to provide technical help to undertake commercial fish farming in his pond. Mr. Haque availed the benefit of NFDB funded Training and Exposure Visit through the Dept. of fisheries, Govt. of Bihar



Inside view of cemented tanks provided with indigenous cold mitigating arrangement of poly-shed developed by Mr. Mazaharul Haque to protect *Pangasius* seed in Nautan village, Siwan district, Bihar

Initially he constructed 4 cemented tanks each of size 12 x 24 x 6 ft (3.6 x 7.2 x 1.8 m) for *Pangasius* seed rearing. After getting success, he added 3 more cemented tanks of same size in same series. Each tank receives ground water from the bottom as well as from the surface so as to mix thoroughly and prevent thermal stratification. Ground water was supplied 2-3 hrs daily with the help of 2 HP water pump fixed outside the system. Four electric bulbs of 200 Watts were kept on for 4 to 5 hrs daily on each tank. Using bricks a shed wall was constructed around cemented tanks. With the help of bamboo poles and iron pipes a framework was provided over the cement tank system. The framework was first covered with poly-netting which again was covered with polythene sheet during winter to prevent cold dewdrops falling inside the tank water. However, during summer months plastic sheet was removed and shed wall was made aerated and at times, covered with tin sheets and gunny bags.



View of cemented tanks provided with arrangement for poly-shed developed by Mr. Mazaharul Haque in Nautan village, Siwan district, Bihar

In Northern part of Uttar Pradesh and Bihar air temperature drop down to 4-8 °C. *Pangasius* does not survive long exposure to this temperature in culture system. By using this indigenous cold mitigating mechanism water temperature has been maintained to 12-18 °C, while water temperature in the adjoining ponds was 6-8 °C. The ground water temperature is generally 22-24 °C. Thus the cumulative effect of ground water addition, polythene shed and heat from electric bulbs have increased water temperature in cement tanks to make it conducive for survival of *Pangasius* seed.

Each tank was cleaned and filled with ground water maintaining about 1.2 m water depth. *Pangasius* seed of 0.5 g average weight were stocked @ 20,000/tank in the month of November. Fish were fed *ad libitum* with commercial formulated fish feed twice a day. During late night 4-5 hrs/day electric bulbs were kept on and daily 2-3 hrs ground water was supplied. Periodically about 30% water was exchanged with ground water. The nutrient rich waste water from the cemented rearing system was drained out through outlets and released into earthen grow out fish pond. In 3 month rearing 0.5 g fry grew to about 10 g fingerlings. They were sold @ Rs 6 each. From 7 cemented tanks Mr. Haque harvested 1,33,000 fingerlings worth of Rs. 7.98 lakh. From this

venture by expending Rs. 4,11,639 farmer made a net earning of Rs. 3,86,361 in three months time from 7 cemented tanks. After harvesting the fingerlings, the cemented tanks have been utilized for grow-out of *Pangasius* during April to November. Tanks were stocked @ 500 fingerling/ tank. Fish grew over 1.0 kg in 7-8 month on supplementary feed. From 7 tanks farmer harvested 3,500 kg *Pangasius* in 8 month. Fish were sold @ Rs. 115/kg at the farm gate. Cost of fish production was computed to be about Rs 60/kg. Gross income from grow out fish culture was estimated to Rs 4,02,500/- against the total expenditure of Rs 2,10,000/- leaving a net earning of Rs 1,92,500 in 8 month. Thus the annual net earnings were Rs. 5.788 lakh/ 217 m³ (Rs. 2,668/ m³).

In order to meet the demand of quality *Pangasius* fingerlings during March-April in the region, such indigenous innovative model needs to be replicated in Bihar by resource-rich entrepreneurs.

(2.4.2) NFDB funded Training & Exposure Visit motivates Progressive Farmers to take up Fish Farming in Siwan district of Bihar

Shri Kumar Rakesh did his BA, LLB and was working in LIC of India as Sr. Divisional manager. He underwent NFDB assisted training and exposure visit. After seeing the scope and profitability in fish culture, he left his job and took to fish farming. Shri Kumar Rakesh constructed 19 fish ponds of different size in 44 ha owned Chaur area, out of which a 4.0 ha pond was constructed under NFDB assisted scheme for new ponds and one-time inputs cost for *Pangasius* culture. His fish farm in Sherpur Chaur in village & P.O. Chainpur, P.S. Guriakothi, in district Siwan, Bihar, was inspected along with Mr. Manish Kumar Srivastva, DFO, Siwan. Currently Shri Rakesh is having 12 ha pond area for fry, fingerlings and yearling rearing, 24 ha for IMC & Exotic Carp Culture and 4 ha for *Pangasius* culture.



Dr. Radheyshyam, Sr. consultant (Fisheries), NFDB, interacting with Shri Kumar Rakesh at his fish farm in Chainpur village, Siwan district, Bihar

During summer months 24 ha pond area was made free of predatory and weeds fishes. Pond productivity was increased by applying inorganic and organic manure. Ponds were stocked with 80-120 g yearlings of IMC and Exotic Carps @25,000/ha. Fish were fed with mustard oil cake and wheat bran. Culture was

carried out for 9 months. Fish that grew to above 1.0 kg were harvested intermittently. produced about 70 ton fish in 9 month from 24 ha. Fish production rate was 3.98 t/ ha/ yr. Fish weighing above 1.0 kg were sold @ Rs 200-250/ kg at the farm gate to fish vendors.

Shri Kumar Rakesh also prepared the 4.0 ha pond for *Pangasius* culture. Every year, about 70 fish vendors purchase fish from Shri Kumar Rakesh's farm and earn Rs. 600-1000/day.

(2.4.3) Progressive Fish Farmer in Siwan district of Bihar establishes Carp Hatchery Complex with NFDB financial assistance

With financial assistance provided by NFDB Shri Umesh Kumar, progressive farmer established a Carp Hatchery Complex at Gauria Kothi, in Siwan district of Bihar. He constructed 1 spawning pool, 2 hatching pools, and an overhead tank. Shri Umesh Kumar developed and maintained 1000 brood stock fish each weighing above 2 kg. About 20 liter spawn is produced per breeding cycle. The production capacity of the hatchery is 10 million spawn per year.



Carp Hatchery Complex established with NFDB assistance by Shri Umesh Kumar at Gauriakothi, in Siwan district of Bihar

(2.4.4) Progressive Farmer establishes a Carp Hatchery and Fish Farm with NFDB assistance in Siwan district of Bihar

Shri Himansu Kumar Singh, progressive farmer, acquired 4.5 ha of Gauriya Kothi Chaur in Siwan district of Bihar. He constructed 9 nursery pond, 3 stocking ponds, and 1 hatchery complex comprising of 1 spawning pool, 2 incubation pools and 6 cemented nursery tanks. A total of 60 liter carp spawn is produced annually. With financial assistance provided by NFDB, he constructed fish ponds also. In a 1.0 ha pond he cultured Indian Major Carps by stocking @ 10,000 fingerlings. IMC above 1 kg were sold at Rs. 180-200/kg whereas, common carp fetched Rs. 130/kg and grass carp Rs. 160/kg at farm gate. In a 2.0 ha pond monoculture of *Pangasius* was carried out. Pond was prepared and stocked with 2.5 g fingerlings of *Pangasius* @ 30,000/ha. Fish were fed with formulated feed daily. In 7-8 month, fish grew to 1.0-1.5 kg. *Pangasius* production was 30 t/ ha/ yr. Cost of fish production is reported to be Rs.70/kg.

3. New/ Innovative Technologies in Fisheries

3.1 Prototypes of small-scale fish processing equipment developed by CFTRI under NFDB funded project

With a view to promoting fish consumption in the country through convenience products, NFDB sanctioned and released Rs. 68.48 lakh under Technology Up-gradation Project (TUP), to Central Food Technological Research Institute (CFTRI), CSIR, Mysuru, Karnataka, for the 38-month project entitled “Development of value added fish meat based products and designing/ demonstration of small scale fish processing equipments required”. Dr. N. Bhaskar was the Principal Investigator; Dr. K. Venkatesh Murthy, Dr. P. Prabhasankar and Dr. K.V. Harish Prashanth were the Co-Investigators. Apart from value added products, they developed prototypes of fish meat-bone separator, fish filleter, fish scaler, fish fryer, etc., which can be got locally fabricated by prospective entrepreneurs.

Fish, like other animals, need to be processed for convenience of cooking and consumption. This is done either using manual tools or mechanically using simple machines. In the September-October 2015 Issue of ‘Matsya Bharat’ (Vol. 7, Issue 3, page 19), a brief description and pictures of ‘Fish Bone Separator’ were included. Here, a brief account of (i) ‘Fish Scaling Machine’ and (ii) ‘Fish Filleter’ is given.

(i) Hand-held Fish Scaling Machine

Most fish, except Catfishes, have scales covering the body which have to be removed before further processing. As manual scaling is clumsy and unhygienic, a simple ‘Handheld Fish Scaling Machine’ has been designed by CFTRI. Basic principle involved in design of Fish Scaler is of rotational shear of the blade which cuts the scales of the fish. The circular multi cutting edged barrel (cutting blade) having a diameter of 20 mm is mounted on a



Hand-held Fish Scaling Machine

horizontal shaft. The shaft, in turn, is mounted on the main spindle of the prime mover (Fish Scaler). An electric motor having a power of 750 W is used as the prime mover to rotate the cutting blade at a rated speed of 1440 RPM. The multi edged cutting blade is provided with a guard to protect the spillage of the scales.

Hygiene is most essential in food processing. In order to maintain the hygienic practice, the material of construction of the Fish Scaler has been carefully selected. Material having highest corrosion resistance has been selected where ever food materials come in contact. Stainless steel of SS-316 L variety has been chosen as the material of construction for the Fish Filleting Machine. Capacity of the machine is in the range of 2.0 - 2.5 kg/ hour.

(ii) Fish Filleting Machine

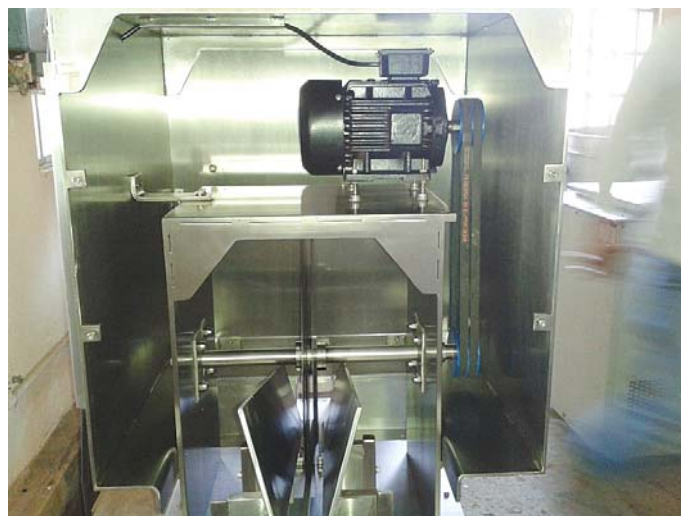
Whole fish for convenience of cooking and consumption are cut into pieces of desired size and shape. Lengthwise pieces cut from sides are called Fillet; cross-sectional cut pieces are called Steaks; and slender, smaller pieces made out of Fillets/Steaks are called Portions/Sticks. The fish filleting machine was designed and developed for small scale fish processing industries to increase the efficiency of production and solve labour-intensive problems. The prototype of this design was built and evaluated for its performance. Integration of processing variable, quantitative and qualitative parameter analysis has shown the benefit of the designed machine proposed for small scale processing operations. The capacity of the fish filleting machine has been estimated to be around 250 kg/ hour.

Stainless steel of SS-316 grade was the preferred choice as it is allowed under the present food regulations as a contact surface. The use of SS-316 in food processing is based on: (a) its non-porous surface which does not absorb odours and flavors and does not provide breeding ground for bacteria and fungi; (b) its resistance to corrosion by foods, acidic or alkaline cleaners, disinfectants and other substances used in food processing; (c) withstands mechanical damage during installation, servicing and prolonged use; and (d) its excellent formability that allows any given cold forming, deep drawing and other standard forming processes.

The fabricated machine was validated for its efficiency measured basically in terms of amount of fish filleted. The total cost of fish filleting machine as per the in-house design and fabricated locally at the point of works is close to Rs. 3.5 lakh, including profit; the total selling cost would be close to Rs. 4.5 lakh, which includes taxes and marketing cost.



External view of Fish Filleting Machine



Internal view of Fish Filleting Machine

4. NFDB Initiatives

4.1 Workshop on ‘Role of NGOs in Development of Fisheries in Coastal Andhra Pradesh’ organized by NFDB, Hyderabad

A two-day State level Workshop on ‘Role of NGOs in Development of Fisheries in Coastal Andhra Pradesh’ was organized on 28th and 29th January 2016 by NFDB at Hyderabad. The objective of the workshop was to strengthen and make the NGOs more effective in developing especially marine fisheries in the coastal districts of Andhra Pradesh. The Workshop was coordinated by Dr. R. Suresh, Sr. Consultant, Ms. S. Glory Swarupa, Consultant and Mr. R. Vijayan, Jr. Consultant. 142 participants representing NGOs and fishermen societies and fishermen from 11 districts, viz., Srikakulam, Visakhapatnam, East Godavari, West Godavari, Krishna, Prakasam, Nellore, Chittoor, Anantapur and Hyderabad participated in the program.

Shri K.N. Kumar, Chief Executive, NFDB, expressed concern about the very poor economic status of the marine fishing community and said that NFDB is making efforts to reach out to the marginal and vulnerable fisher community through the network of NGOs. He stressed on the importance of marine capture fisheries and livelihood development of the traditional fishers. Dr. M. Vijay Gupta, Asst. Director General, World Fish Centre (Retd.), in his Inaugural Address stated that due to increase in population, demand for aquaculture has increased; small marine fish are more nutritious than fresh water fish and marine fish production is declining. He informed that Role of NGOs was not recognized by the United Nations until 1980s and now they are recognized as major players in the development of the marine fisheries.



Inaugural Session of State level Workshop on ‘Role of NGOs in Development of Fisheries in Coastal Andhra Pradesh’ organized by NFDB at NIRDPR, Rajendranagar, Hyderabad

Dr. C.M. Muralidharan, FAO Consultant and Member of International Collective in Support of Fish workers (ICSF), Chennai, made a presentation on Status of Fisheries in Coastal Districts of Andhra Pradesh – Role of NGOs. Mr. Anjaneyulu, Regional Manager, Action Aid, Hyderabad, made a presentation on Development of Fishermen Community through NGOs. Ms. K. Padma, President, Matsya Karula Matsya Karmika Sangham (MKMKS), Hyderabad, spoke on Empowerment of Fisher Women and shared her own Experience. Mr. Rafik and his team from M/s Open Pearl Fisheries, Mangaluru, Karnataka, explained about the alternate livelihood opportunity provided to 200 fisherwomen engaged in making Surumi and exporting to Japan. At the end of the first day participating NGO representatives were made to engage in Group activity.



Presentation by Dr. C.M. Muralidharan, ICSF, Chennai, on Status of Fisheries in Coastal Districts of Andhra Pradesh – Role of NGOs (above) and a section of participants

The second day of the Workshop started with Presentations by NGO Groups, followed by a Discussion on NFDB's role in Development of Fisheries by panelists comprising Dr. B. Mary Regina, Shri D. Gopi Reddy, Dr. M. Persis, Sr. Executives, NFDB.

Later, Dr. T.V. Suresh, Consultant, NFDB, made a presentation on Emerging areas for alternative livelihoods. This was followed by a Discussion on Skill Development for the fishermen youth, by panelists comprising Dr. M. Ravi Babu and Mr. Naveen



Participants interacting and giving their impressions and feedback about the Workshop

Kumar, of NIRDPR and Dr. S. Senthil Vinayagam, NAARM, Hyderabad.

Shri PVSL Narasimham, M/s Teewave Technologies, Hyderabad, made a presentation followed by demonstration on Solar Wind Hybrid Chilling, Drying for Fish and other Technologies using pilot scale models developed by them.

Shri K.N. Kumar, Chief Executive, NFDB, gave his concluding remarks and presented the proceedings of the two-day Workshop. The Telugu translation of the Workshop Proceedings was also distributed to the representatives of the NGOs.



Participants of State level Workshop on 'Role of NGOs in Development of Fisheries in Coastal Andhra Pradesh' organized by NFDB at NIRDPR, Rajendranagar, Hyderabad

4.2 Capacity Building Conclave Organized at NFDB, Hyderabad

A two-day Capacity Building Conclave was organized by the Human Resource Development (HRD) Division of NFDB on 25th and 26th February 2016 at NFDB, Hyderabad, exclusively for the Fisheries Colleges/ Polytechnics/ Training Institutes/ Universities/ ICAR Institutes involved in fisheries education and human resource development. The objective was to know their present activities and to explore new initiatives in capacity building in collaboration with NFDB. Twenty five academicians

and trainers from the States of Andhra Pradesh, Assam, Karnataka, Kerala, Maharashtra, Meghalaya, Odisha, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal participated. The Conclave was coordinated by Dr. R. Suresh, Sr. Consultant, Ms. S. Glory Swarupa, Consultant and Mr. R. Vijayan, Jr. Consultant.



Dr. M. Vijay Gupta, Shri K.N. Kumar, and other Officers of NFDB at the Capacity Building Conclave organized by the HRD Division of NFDB on 25th and 26th February 2016 at NFDB, Hyderabad

Shri. K.N. Kumar mentioned that time has come to look at HRD in fisheries afresh and innovatively. There is a need to prepare road map for HRD initiatives for the sector as each sector has specific requirement at different layers. Formal education programmes are necessary, but not sufficient. Hence establishment of polytechnics in the fishery sector will be an emerging model. Placement linked Skill development programmes for youth from traditional fishermen families is also being thought of by the NFDB. He urged the participants to plan and include innovative HRD programs in the current academic year.

Dr. M. Vijay Gupta, Asst. Director General, World Fish Centre (Retd.), in his inaugural address gave a comparative picture of Indian fishery sector and other developing countries over the years. India lost its lead position while South East Asian nations are performing well. Need based trainings to the farmers, students, youth, women and children should be taken up on priority basis in India. Constraints/risks in standardizing the technology and transfer of technology should be properly diagnosed. He shared many of his Bangladesh experiences. He concluded that a missionary zeal is required to help poor fishermen.

Dr. S.D. Tripathi, former Director of CIFA, Bhubaneswar, gave a keynote address. He suggested that the training programmes be customized to suit the requirement of farmers to improve their livelihood. He cited the difference between India and other countries. Appreciated the progress of KUFOS (Kerala), Tamil Nadu and Andhra Pradesh Universities for the remarkable growth in fishery sector. He explained the importance of traditional fish farming systems and indigenous species particularly *Amblypharyngodon mola*, (rich in Vitamin A content) and its culture. He cautioned that exotic species have to be monitored carefully.



Dr. S.D. Tripathi, former Director of CIFA, Bhubaneswar, delivering keynote address at the Capacity Building Conclave at NFDB

All the participants made presentations on the capacity building programmes, outreach programmes and extension activities undertaken in their institutes and proposed some innovative HRD programmes they intend to launch, with assistance from NFDB, for the development of fisheries sector. After each presentation, there was a discussion and decisions taken by the house were recorded for further action.



Participants of the Capacity Building Conclave organized at NFDB, Hyderabad

4.3 Skill Development Meeting with APHRDI and APSSDC Officials held at NFDB, Hyderabad

A meeting to discuss Skill Development initiatives of NFDB with Shri D. Chakrapani, IAS (Retd.), Director General, AP Human Resource Development Institute (APHRDI), Govt. of AP and Ms. Aparna Upadhyayulu, IAS, Deputy CEO, AP State Skill Development Corporation (APSSDC), Govt. of AP, was held at NFDB on 17th February 2016. Shri K.N. Kumar, Chief Executive, NFDB, Dr. R. Suresh, Sr. Consultant and Ms. S. Glory Swarupa, Consultant, HRD, participated in the meeting.



Meeting on Skill Development with officials of APHRDI and APSSDC at NFDB, Hyderabad, held on 17th February 2016

Shri K.N. Kumar made the presentation on NFDB initiatives to impart Skill Development training to the youth of traditional fishermen community. He listed the various factors that contribute to their poor living conditions. He highlighted the importance of Skill Development as one of the measures to support their livelihoods. He shared the strategies and roadmap for the implementation of the scheme.

Later, there was a discussion on the suitable/potential trades in both fisheries and non-fisheries sector, National Occupation Standards (NOS), Qualification Packages (QP) for job roles, experiences of APSSDC, mobilisation of potential candidates, etc. It was decided that APHRDI will conduct a stakeholders workshop at one of the coastal districts to obtain suggestions, opinions and ideas from all the organisations involved in the development of fishermen community.

4.4 Brainstorming Workshop on Ornamental Fish held at NFDB, Hyderabad

A one-day 'Brainstorming Workshop on Ornamental Fish' was held at NFDB on 29th February 2016 with the objectives to: (i) identify the priority areas for the proposed Institutional Initiatives on Ornamental Fish by NFDB and (ii) set the agenda and enlist participants for the proposed National Consultation on Ornamental Fish at NFDB. Fourteen invited delegates and thirty officials from NFDB participated. After the formal introduction of participants, Dr. V.V. Sugunan, Senior Consultant (Fisheries), briefed on the objectives and expected outputs of the meeting. The participants engaged in group discussions in four Technical Sessions.



Panelists (above), invited delegates and NFDB officials (middle & below) 'Brainstorming on Ornamental Fish' at NFDB on 29th February 2016

Technical Session-I: Ornamental Fish Breeding and Culture for Income Generation and Livelihoods for the Poor and Women; Group Members: Dr Seenappa (Group Chair), Dr Viswanath, Dr Sanjay Das, Dr Swagat Ghosh, Dr Ajit Kumar, Dr Gopakumar, Dr Krishna Sukumaram, and Dr Saroj Swain. Rapporteurs: Ms Deepa Suman and Mr Viswas Rao.

Technical Session-II: Opportunities in Growth of Export Trade; Group Members: Dr Atul Jain (Group Chair), Dr Anna Mercy, Dr Paromita Banerjee, Dr Archana Sinha, Dr B K Bhattacharjya, Dr Rejani Chandran; Rapporteurs: Mr Bhogeswar, Mr Vijayan and Mr M Ramesh.

Technical Session-III: Protection of Wild Stock & Biodiversity Conservation; Group Members: Dr Viswanath (Group Chair), Dr Sanjay Das, Dr Saroj Swain, Dr Archana Sinha, Dr Gopakumar, Dr Rejani Chnadran and Dr Bhattacharjya; Rapporteurs: Ms Deepa Suman and Mr Viswas Rao.

Technical Session-IV: Role of Cooperative, SHGs, NGOs; Group Members: Dr Seenappa (Group Chair), Dr Swagat Ghosh, Dr Anna Mercy, Dr Atul Jain, Dr Krishna Sukumaran, Dr Paromita Banerjee, and Dr Ajit Kumar; Rapporteurs: Mr Bhogeswar, Mr Vijayan and Mr M Ramesh.

The four groups came up with outputs under four heads: (i) Priority Areas & Key Issues, (ii) Opportunities & Challenges, (iii) Possible role of NFDB, and (iv) Key Organizations/Individuals who can contribute in the proposed National Consultation with regard to their respective themes. Group findings were presented in the Plenary Session chaired by Dr. V.V. Sugunan in the presence of a Panel comprising Dr. K. Ravindranath, Dr. Radheshyam, and Dr. R. Suresh all of NFDB.

4.5 Stakeholders Meeting on Skill Development for Fishermen Youth held in Srikakulam district, Andhra Pradesh

As a follow-up of the Skill Development initiatives of NFDB, a Stakeholders Meeting was organised for Fishermen Youth at 21st Century Gurukulam, Etcherla, Srikakulam district, Andhra Pradesh, on 3rd March 2016 by Andhra Pradesh Human Resource Development Institute (APHRDI), Govt. of AP. Dr. Utpal Kumar Sar, Executive Director (Tech), Dr. R. Suresh, Sr. Consultant and Ms. S. Glory Swarupa, Consultant, NFDB, participated in the programme.

Shri Lakshmi Narasimham, IAS, District Collector, Srikakulam was the Chief Guest. The meeting was attended by the officials from APHRDI, Andhra Pradesh Skill Development Corporation (APSSDC), Govt. of AP, State Fisheries Dept., Central Institute of Fisheries Technology (CIFT), State Institute of Fisheries Technology (SIFT), Fisheries Survey of India, National Institute of Fisheries Post Harvest Technology & Training (NIFPHATT), NETFISH, training institutions, fishermen, representatives of fishermen cooperatives, representatives of NGOs from Visakhapatnam & Srikakulam and reporters from press & media. A total of 170 persons participated in the program.

Shri D. Chakrapani, IAS (Retd.) Director General, APHRDI, Govt. of AP, detailed the objective of the meeting in his inaugural address. Ms. Aparna, IAS, Dy. CEO, APSSDC, Govt. of AP, made the presentation on the government initiatives with respect to Skill Development, the vision, mission and the tentative action plan. Ms. S. Glory Swarupa, Consultant (HRD) made a presentation on NFDB initiative on Skill Development for Fishermen Youth.

Shri Lakshmi Narasimham, IAS, District Collector, Srikakulam, listed the potential need based skills to be imparted for the local youth, to stop migration of fishermen. After interacting with stakeholders, a dozen trades were identified for Skill Development of fishermen youth, and APSSDC would prepare draft proposals in consultation with the training institutes and NFDB.

4.6 Review of New TUP Proposals by Technical Expert Committee at NFDB

With a view to cater to the R&D needs of the fisheries sector, NFDB has been providing 100% financial assistance to Technology Up-gradation Projects (TUP) submitted by scientists



Technical Experts Committee reviewing new proposals of Technology Up-gradation Projects (above) and Project Presentations (below)

and academicians. TUPs are meant to fine-tune, upscale and demonstrate technologies that have already been developed. On 29th and 30th September 2015 a review meeting of TUPs funded by NFDB was conducted and 17 Project Leaders made presentations at NFDB on their progress. Specific recommendations pertaining to all ongoing projects, including action plans have been communicated to the Project Leaders.

Later, Dr. V.V. Sugunan, Sr. Consultant (TUP), NFDB, undertook a review of all TUPs supported by NFDB since inception. Two major findings of the review exercise was (i) Lack of balance in priorities in the TUP research portfolio and (ii) Scope for improving the quality of projects submitted to NFDB for support. This matter was further discussed with some experts including Dr. M.V. Gupta, Dr. A.G. Ponniah and Dr. Seenappa, who visited NFDB in January 2016. A need was felt for a National level exercise to determine and shortlist a set of top ten priorities at NFDB for TUP funding.

In the interregnum, a Technical Expert Committee (TEC) was constituted to critically evaluate the 12 New Project Proposals received for funding under the TUP Scheme of NFDB. The members of the TEC were: Dr. S.D. Tripathi, Mumbai (Chairman), Dr. K.K. Vass, New Delhi (Member), Dr. E. Vivekanadan, Chennai (Member), and Dr. V.V. Sugunan (Member Secretary). Based on the presentations made by the respective Principal Investigators on the 24th and 25th of February 2016 at NFDB, Hyderabad, the Committee suggested revision and resubmission of six projects and observed that the other six do not fall under the purview of TUP Scheme of NFDB.

4.7 Workshop on Ethics in Public Governance organized at NFDB

A one-day 'Workshop on Ethics in Public Governance' was organized on 23rd March 2016 at NFDB. All the Officers, Consultants, Technical, Administrative and Outsourced Staff participated and interacted. Shri K.N. Kumar, Chief Executive, NFDB, in his opening remarks observed that the Workshop is being organized to sensitize on probity in public life and to bring about a change in the mindset about people and environment. Dr. W.R. Reddy, Director General, NIRDPR, was the Guest of Honour, and in his address he reminded all that positive thinking makes things happen and that we should get involved, be passionate and give our full attention to our work.



Shri K.N. Kumar, Dr. W.R. Reddy and Shri Suresh Katri at Inaugural session of the Workshop on Ethics in Public Governance organized at NFDB

The sessions were handled by Shri Suresh Katri, founder of Initiative of Change (Iofc), Pachghani, Maharashtra. The Iofc team comprising of Leena Khatri from Pachghani, Maharashtra, Anup Pawar, from Pune, Maharashtra, Gaurav Sah, from Nainital, Uttarakhand, Wangyal Damko, from Tibet, Narendra Chandolu, from Vijayawada, AP, Asma Shah, from Srinagar, Kashmir, Stephania Menezes, from Udipi, Karnataka, and Zooni Dash, from Odisha, spread the message of finding one's inner voice, introspection, serving others, etc., through short Skits, demonstrations and personal narrations. They persuaded the participants to join their 'Character Bank of India' by filling Credit Slips with commitments of good character, etc. Finally, Shri Katri of Iofc got an exercise done by the participants on how to commit themselves for further improving the performance of NFDB.



NFDB Officers and Staff and Team from Iofc that participated in the Workshop on Ethics in Public Governance at NFDB, Hyderabad

5. Important Events

5.1 NFDB Calendar and Diary and Books on Fish Names released

On 1st January 2016, a function was organized at NFDB, Hyderabad, to celebrate the New Year Day amongst some distinguished guests. Dr. Dilip Kumar, former Director and Vice-Chancellor, Central Institute of Fisheries Education and Deemed Fisheries University (ICAR), Mumbai was the Chief Guest. Shri A. Chalapati Rao, was the Guest of Honour. Officers & Staff of NFDB participated. Dr. Dilip Kumar released the 2016 Calendar and Diary of NFDB.

Later, books on 'Vernacular Names of Common Fishes', one in Hindi and another in Telugu written by Shri A. Chalapati Rao were also released by Shri K.N. Kumar, Chief Executive, NFDB. Dr. Dilip Kumar and Shri Aluri Chalapati Rao were honoured with a Memento on the occasion.



Release of Books on Vernacular Names of Fishes on New Year's Day at NFDB, Hyderabad

5.2 NFDB participates in 'Indian Science Congress' held at Mysuru, Karnataka

The 103rd edition of 'Indian Science Congress' (ISC) was held at University of Mysore, Mysuru, Karnataka, from 3rd to 7th January 2016. The theme of ISC was "Science & Technology for Indigenous Development in India". The Hon'ble Prime Minister Shri Narendra Modi inaugurated the Congress at the Amphitheatre 'Manasagangotri' on the campus.

Nearly 100 eminent scientists and 400 senior scientists participated; 30 plenary talks were delivered on subjects like Nano Science, Space Science, Technology & Applications, Diabetes, Evolution: The Frontiers, Atomic Energy, Safe Water and Sanitation, Diseases and Drug Development, Public-Private Partnership for the Swachh Bharat Mission Initiative, etc. On the opening day, Bharat Ratna Prof C.N.R. Rao delivered the Bharat Ratna Sir M Visvesvaraya Lecture on 'Doing Science in India'.

As part of Indian Science Congress, Children Science Congress, Women's Science Congress, Science Communicators Meet and a Mega Expo 'Pride of India - Frontier Science & Technologies' were organized. The Pride of India Exhibition was open to the general public on all the five days. NFDB participated in the mega exhibition; Dr. T.V. Suresh, Consultant (Tech.) and Mr. Bhogeshwar, Intern, NFDB, put up the stall with posters, ornamental fish aquaria, audio-visual display, etc. Newsletter *Matsya Bharat* and brochures on NFDB Schemes were distributed to the visiting scientist, officials, researchers, students and general public.



Students visiting NFDB Stall at the Mega Exhibition at 103rd Science Congress, Mysuru, Karnataka

5.3 NFDB participates in National Workshop on 'Application of Space Technology in Fisheries' at Mangaluru, Karnataka

A two-day National Workshop on 'Application of Space Technology in Fisheries' was organized by the Dept. of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture & Farmers Welfare, Govt. of India, in collaboration with Dept. of

Fisheries, Govt. of Karnataka, on 4th and 5th January 2016 at Mangaluru, Karnataka.

Shri K. Abhyachandra Jain, Hon'ble Minister of State for Fisheries, Youth, Empowerment and Sports, Govt. of Karnataka inaugurated; Shri Ashok Kumar Angurana, IAS, Secretary, Ministry of Agriculture and Farmers Welfare, Govt. of India, was the Chief Guest. In his keynote address Shri Angurana informed that there are about 1.5 crore fishermen in the country of whom 20 lakhs are active; 14 lakh active fishermen were already issued Bio-metric Cards and about six lakh are yet to receive their cards. He urged the State Govt. to complete the issuance before June 2016, as the Bio-metric Cards are very crucial to not only pass on to fishermen the benefit of the space technology related to fishing industry, but also to help them during security check at sea and in resolving issues relating to crossing fishing zones of the States and Countries. He also informed that creation of identity database for convergence and coordination of 20 lakh fishermen becomes critical to Blue Revolution mission envisioned by Hon'ble Prime Minister, followed by an inter-ministerial meet to rollout technology based solution to the fishermen. He also urged that State would have to modernize and upgrade technologies in 167 Monitoring, Control and Surveillance Centres for tracking fishing vessels at sea using the Real Craft Software developed by National Informatics Centre. He further stressed that Space Technology is useful for identification of Potential Fishing Zones in the sea, accurate weather forecast for safety of fishermen and for measurement of area of aquatic resources for fish culture.



Shri Ashok Kumar Angurana, Secretary, MoA&FW, delivering keynote address (above), NFDB Officers and other participants (below) at the Space Technology Workshop, Mangalore, Karnataka

5.4 NFDB participates in 'Aqua Goa Fish Festival' held at Margo Goa

'Aqua Goa Fish Festival' was organized from 8th to 10th January 2016 at Navelin, Margo Goa. Dr. T.V. Suresh, Consultant (Tech.) and Mr. Bhogeshwar, Intern, NFDB, put up an exhibition stall. Hundreds of people, Aqua farmers, fishers, students, officials, dignitaries and general public visited the stall and enquired about NFDB activities; they were explained the objectives, activities, schemes and financial assistance provided by NFDB, Hyderabad, for fisheries development and for the welfare of fisherman. Traders of Ornamental Fish, Fish Feed Manufacturers, Frozen Fish, Dry Fish and Value Added Products traders, Fisherman Co-operative Societies, Fishing Boat Owners Associations, Govt. institutions and organizations like MPEDA, CMFRI & CCARI of ICAR, also participated in the festival.



'Aqua Goa Fish Festival' organized at Navelin, Margo Goa (above) and NFDB Stall (below)

5.5 NFDB celebrates Republic Day

The Republic Day of India was celebrated on 26th January 2016 at NFDB, Hyderabad. The function started with the hoisting of National Flag by Shri K.N. Kumar, Chief Executive, NFDB, followed by a rendering of the National Anthem, and a brief address by Shri K.N. Kumar.



Shri K.N. Kumar, Chief Executive, addressing the Officers and Staff on the occasion of Republic Day celebration on 26th January at NFDB, Hyderabad

5.6 Second International Symposium on Genomics in Aquaculture held at CIFA, Bhubaneswar

The Second International Symposium on Genomics in Aquaculture (ISGA-II) was held at Central Institute of Freshwater Aquaculture (ICAR-CIFA), Bhubaneswar from 28th - 30th January 2016. On this occasion an exhibition was arranged in which NFDB participated. Shri A.K. Borah, Executive Assistant, NFFBB, Bhubaneswar, put up the NFDB Stall having posters, audio-visual display, ornamental fish aquaria, brochures, newsletter application forms, etc., showcasing different schemes and activities of NFDB among the visiting scientists, researchers, technocrats, fish farmers, etc.



Exhibition organized in connection with the Second International Symposium on Genomics in Aquaculture held at Central Institute of Freshwater Aquaculture, Bhubaneswar

5.7 Field Officers and Branch Managers of Banks visit NFDB

A batch of 33 Field Officers and Branch Managers of Corporation Bank in Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu and Telangana States are attending one week training on Agricultural Finance (Rural & Investment Credit) from 1st to 5th February 2016 at NIRDPR, Hyderabad, and the programme is coordinated by Shri R. Koteswara Rao, Project Consultant, Centre for Rural Credit and Development Banking (CRCDB). They visited NFDB on 4th February 2016 for acquainting with the developments in fisheries sector.

Ms. S. Glory Swarupa, Consultant, welcomed the participants and Dr. R. Suresh, Sr. Consultant (HRD), NFDB, explained the basics of fisheries technology. Dr. M. Persis and Mr. Chandan Chetri, Sr. Executives (Tech), explained about the activities and schemes of NFDB.



Field Officers and Branch Managers of Corporation Bank from different States, on a visit to NFDB

5.8 Fisheries Officers from Madhya Pradesh visit NFDB

Twenty Fisheries Officers from Dept. of Fisheries, Govt. of Madhya Pradesh, visited NFDB on 8th February 2016 and interacted with the Shri K.N. Kumar, Chief Executive and other NFDB officials. They appraised about various NFDB activities and schemes, projects implemented in Madhya Pradesh State, and explored opportunities for further development of fisheries in their State with NFDB assistance.



Fisheries Officials from Madhya Pradesh on a visit to NFDB, Hyderabad

5.9 MANAGE Trainees visit NFDB

National Institute of Agriculture Extension Management (MANAGE), Rajendranagar, Hyderabad, conducted a training program on Revitalisation of Rainfed Agriculture (RRA) to 27 participants from Bihar, Jammu, Himachal Pradesh, Madhya Pradesh, Maharashtra, Manipur, Tamil Nadu and Telangana States from 8th to 13th February 2016. On 12th February 2016 they visited NFDB to acquaint themselves with developments in the allied fisheries sector. As requested by Dr. Sai Maheswari, Course Coordinator, MANAGE, Dr. K. Ravindranath, Sr. Consultant (Tech), NFDB made a comprehensive presentation on 'Marketing Strategies for Inland Fisheries Sector and Some of the NFDB Initiatives'. Dr. V.V. Sugunan, and Dr. Radheyshyam, Sr. Consultants, NFDB, interacted with the trainees and answered their queries.



MANAGE Trainees from different States, on a visit to NFDB

5.10 International Conference on 'Aquatic Resources & Sustainable Management' held at Science City, Kolkata

An International Conference and Exhibition on 'Aquatic Resources & Sustainable Management' was organized by Central Calcutta Science and Culture Organization for Youth, at Science City, Kolkata, in collaboration with University of Calcutta, at Science City, Kolkata, from 17th to 19th February 2016. NFDB provided Rs. 4.00 lakh assistance for the event, and put up a Stall to showcase various NFDB activities and schemes to the visiting fish farmers, students, research scholars, professors of various colleges and universities, fisheries professionals, scientist, entrepreneur, etc. Shri Ashim Kumar Borah, Executive Assistant (Tech), NFFBB, Kausalyagang, Bhubaneswar was in-charge of the stall.



Dr. Rabiranjana Chattopadhyay, Honorable Minister-in-Charge, Department of Science & Technology, Govt. of West Bengal, at the NFDB exhibition stall at Science City, Kolkata

5.11 National Level Matsyamela – 2016 held at Mangaluru, Karnataka

A National Level 'Matsyamela-2016: The Great Indian Fish Festival' was organized from 4th to 6th March 2016 at Mangaluru, Karnataka, by Karnataka Veterinary, Animal & Fisheries Sciences University, Bidar, and College of Fisheries, Mangaluru, in



People visiting the Exhibition at NFDB sponsored 'Matsyamela-2016' organized at Mangaluru, Karnataka

collaboration with Dept. of Fisheries, Govt. of Karnataka, NFDB, Hyderabad, and Karnataka Fisheries Development Corporation (KFDC), Mangaluru.

The objective of *Matsyamela-2016* was to promote: fish and fishery products as healthy food; fisheries education in India; ornamental fisheries sector as an alternative livelihood; and showcasing the fisheries sectors' potential in eradicating hunger and malnutrition. On this occasion, a 'National Symposium on Blue Revolution-II: Way Forward' was held. Dr. Utpal Kumar Sar, Executive Director (Tech), NFDB, participated in the event and gave a presentation on the NFDB Schemes.



Dr. Utpal Kumar Sar, Executive Director (Tech), making a presentation on NFDB Schemes

5.12 Amidst Fisherwomen, NFDB Observes International Women's Day

International Women's Day was observed on 8th March 2016 at NFDB. The event was organized by the Women Officers, Technical Staff and Supporting Staff of NFDB. Office Bearers and Members of Fisherwomen Societies, SHG Members, Matsya Mitra and Matsya Sri Group Members and Women Fish Vendors, from Hyderabad and Ranga Reddy districts were the special invitees on this occasion. Ms. Glory Swarupa, Consultant (HRD), welcomed the participants. Dr. Manne Persis, Sr. Executive (Tech), said that International Women's Day was first observed in 1911 and that as per UN declaration by 2030 women ought to comprise 50% of the workforce across all sectors the world over. Dr. B. Mary Regina, Sr. Executive (Tech), explained about NFDB Schemes that can be availed by fisherwomen and women entrepreneurs. Ms. Deepa Suman, Executive (Tech), explained about NFDB Scheme on Ornamental Fisheries. Ms. K. Bhargavi, Executive Assistant (Tech), explained about the immense scope for fisherwomen/ women entrepreneurs for establishing Fish Retail Outlets and taking up preparation of Value Added Fish Products and Pickles with NFDB assistance.

Dr. B. Sarala, Joint Director of Fisheries, recalled how the Dept. of Fisheries and NFDB have been supporting the cause of fisherwomen. A slideshow was presented by Dr. K. Ravindranath, Sr. Consultant, NFDB, highlighting projects launched with NFDB assistance for fisherwomen in different States of the country. Ms. A.V. Madhuri, Executive (Tech), NFDB, reminded the

fisherwomen beneficiaries of NFDB Schemes to be dedicated, determined and continue the activity on their own. Dr. Vinci, Retd. Principal Scientist (Fisheries) said that unlike in 1975 now many women are joining the Agricultural Research Service (ARS) as Fisheries Scientists and contributing to the growth of the sector. The Fisherwomen participants while thanking NFDB for inviting them to participate gave their views and suggestions. Ms. Bhagya, Attender, NFDB, proposed an eloquent Vote of Thanks.



Fisherwomen, Women Entrepreneurs, Women Fisheries Officers and invitees with Chief Executive on the occasion of International Women's Day observed at NFDB

5.13 Guest Lecture organized at NFDB

A Guest Lecture on 'Production Enhancement of Freshwater Aquaculture through Genetic Improvement' was delivered by Dr. Y. Basavaraju, Associate Director of Research, Karnataka Veterinary, Animal Husbandry & Fishery Science University (KVAH&FSU), Hesargatta, Bengaluru, Karnataka, on 11th March 2016 in the Conference Hall at NFDB. Officers and Technical Staff of NFDB and some progressive fish farmers attended and interacted.



Dr. Y. Basavaraju, Associate Director of Research, KVAH&FSU, interacting with the participants

5.14 National Seminar on Seafood Safety, Trade and Management organized by Cochin University of Science and Technology, Kerala

National Seminar on 'Seafood Safety, Trade & Management' was organized by Cochin University of Science and Technology (CUSAT) and University Grants Commission (UGC), from 9th to 11th March 2016 at Kochi, Kerala. Scientists from ICAR Research Institutes, Academicians from Fisheries Universities and students participated. Dr. Manne Persis, Sr. Executive (Tech), NFDB, gave a key note presentation in the plenary session on "Involvement

of NFDB in developing model landing centres, transport systems and fish markets in the country". The three-day Seminar deliberated on various issues and came up with several recommendations on captured and cultured sea foods with reference to their method of harvest, handling, storage, preservation, packaging, cold chain, microbial contamination, residues, food safety standards, bar-coding, awareness and training, etc.



Dr. Manne Persis making a presentation on NFDB interventions for seafood safety, at the National Seminar, CUSAT, Kochi

5.15 NFDB participates in 'Aqua Biz 2016 Exhibition' held at Kakinada, Andhra Pradesh

'Aqua Biz 2016 Exhibition' was held from 12th and 13th March 2016 at Kakinada, Andhra Pradesh. NFDB provided financial assistance for organizing the event and participated in it by putting up a stall. Shri P. Vijaya Kumar, Consultant and Shri M. Ramesh, Jr. Consultant, NFDB, arranged and managed the stall. Posters and banners highlighting NFDB activities and schemes were displayed.



Inauguration of 'Aqua Biz 2016 Exhibition' (above) and NFDB Stall (below), at Kakinada, Andhra Pradesh

The Exhibition was inaugurated by Sri. Pathipati Pulla Rao, Hon'ble State Agricultural Minister, Govt. of Andhra Pradesh, in the presence of Shri Rama Sankar Naik, Commissioner of Fisheries A.P. State and Shri H. Arun Kumar, IAS, Collector (E.G). They all later visited the NFDB Stall and noted with interest the activities of NFDB put on display.

In his inaugural address, the Minister stated that the Govt. of AP allotted Rs. 300 crore for fisheries sector, that fisheries sector in the State recorded a growth of 16-17%, and that 50% of the marine products exported were from Andhra Pradesh. The Commissioner of Fisheries stated that the Dept. of Fisheries is planning to set up 1000 Self Help Groups (SHGs), each with 1000 members and targeting 10 lakh fishers from AP State. Officials of the Dept. of Fisheries, MPEDA, Chairman/ MD of fisheries related companies, entrepreneurs from Rajasthan, Maharashtra and Kerala, besides more than 300 local stakeholders visited NFDB Stall.

5.16 Fisheries Functionaries from Tripura visit NFDB

Tripura Fisheries Training Institute, Udaipur, Gomati, Tripura is conducting a series of training programs for the capacity building of in-service personnel of the Dept. of Fisheries. As a part of this initiative, a group of 23 trainees of the 18th batch were on an Exposure Visit and visited NFDB on 14th March 2016. The participants were newly recruited Fisheries Assistants, and were accompanied by Mr. Jatin Das and Mr. Manik Dattu, Fisheries Officers, Govt. of Tripura.

Dr. B. Mary Regina, Sr. Executive (Tech), made a presentation on NFDB schemes with special reference to Tripura state. Dr. R. Suresh, Sr. Consultant and Ms. S. Glory Swarupa, Consultant (HRD), NFDB, interacted with the participants. The trainees participated and interacted enthusiastically and got all their doubts clarified. They were provided information and contact details to network with various individuals and organisations.



Trainees from Tripura State Fisheries Training Institute on a visit to NFDB

5.17 Fish Farmers from Tripura visit NFDB

As a part of NFDB assisted scheme under Exposure Visit a group of 23 fish farmers along with 2 officials from the Dept. of Fisheries, Govt. of Tripura visited NFDB on 21st March 2016, after visiting places of aquaculture interest in Andhra Pradesh. NFDB Officers Dr. R. Suresh, Shri Chandan Chetri and Ms. A.V. Madhuri, interacted with the fish farmers and gave an overview of the schemes suitable for implementation in the State of Tripura; they were also informed of the procedure for availing NFDB assistance.



Fish Farmers from Tripura State on a visit to NFDB

5.18 NFDB funded one-day National Workshop on Marketing Strategies for Newly Cultured Fishes in India organized at Chennai

Aquaculture in India at the moment is witnessing increased interest in the farming of consumer-oriented indigenous fin fishes such as Sea Bass, Cobia, Milk Fish, Grey Mullet, exotic Nile Tilapia and Catfish (*Pangasius* sp), resulting in increased overall fish production in the country. With this background, a one-day National Workshop on 'Marketing Strategies for Newly Cultured Fishes in India' sponsored by NFDB was organized by the Fisheries Technocrats Forum, Chennai, on 16th March 2016 at the Central Institute of Brackishwater Aquaculture (ICAR), Chennai.

Dr. V.V. Sugunan, Sr. Consultant (TUP), NFDB, participated. Speaking at the Inaugural Session, Dr Sugunan emphasized the importance of addressing market related issues from a perspective of a 'Whole Value Chain' approach. Most of the marketing problems can be linked to the compartmentalized views and actions taken by different segments of the stakeholders. For example, when new species are coming in the scene, planning on the related value chains for absorbing the new products must be in place. Otherwise sudden cataclysmic behaviour of market takes place to the peril of the industry as a whole. Other speakers viz., Dr Santhankrishnan, Aquaculturist; Dr P Ravichandran, Member Secretary Coastal aquaculture Authority, and Dr K K Vijayan, Director CIBA also echoed the same sentiments, while analysing the problems related to handling bulk production of new species.



Dr. V.V. Sugunan of NFDB delivering the inaugural address at the Workshop 'Marketing Strategies for Newly Cultured Fishes in India' at CIBA, Chennai

Mr M Dayalan, a marketing consultant for a sophisticated-high end fish market chain in Bangalore, shared his experience. Mr V Chandran and Mr A Govindaraju of AGR Seafoods, Chennai, explained the specific problems they faced while trying to market Sea Bass, Cobia and other new entrants to the market, compared to the other fishes that emanate from capture fisheries. They have expressed the need for a good Wholesale Fish Market in the city of Chennai. All the existing markets in the city are functioning under unhygienic conditions without adequate infrastructure facilities, they said.

Dr A R T Arasu, Ex-Scientist, CIBA, made a presentation specifically on the issues of marketing Sea Bass. He explained how the market responded with a sudden fall in price, when the Sea Bass was harvested in bulk from the culture ponds. Cold chain arrangements and proper planning to reach the fish to where they are in demand are required to address the issue. He also narrated how other countries, where the volume of production is lower than ours, overcome these problems through 'branding', 'live fish marketing', 'size-specific markets' and other market strategies. This was followed by a professional analysis of the market issues by Dr T Ravishankar, Scientist of CIBA, quoting from the results of a nation-wide comprehensive market study commissioned by NFDB during 2007.

Dr Abdul Nazar, CMFRI, dealt with specific issues related to marketing of Cobia, and Dr Srinivasa Rao, RGCA, on GIFT Tilapia. Both these species are poised for a leap in high volume production, and therefore, several market-related issues are needed to be sorted out before the process of further scaling up of respective technologies. Dr J Santhanakumar of NIOT explained the process of production and marketing of the fish under a community-participated Cage Culture experiment conducted in the Gulf of Mannar. Finally, Dr Arun Padiyar made a presentation on his *Chanos* breeding and culture system. Quoting from the Indonesian experience, he explained the scope for taking up *Chanos chanos* culture in India.

5.19 The 28th Meeting of Executive Council of NFDB held at New Delhi

The 28th Executive Council (EC) Meeting of the NFDB was held on 18th March 2016 at Krishi Bhavan, New Delhi. The EC Meeting was chaired by Shri Ashok Kumar Angurana, IAS, Secretary, Ministry of Agriculture & Farmers Welfare (MoA&FW), Govt. of India, New Delhi.

Some of the proposals the EC considered include: Promoting Ornamental Fisheries in Schools & Colleges; Evaluation of NFDB Schemes through National Council for Rural Institutes; Engagement of Hindi Translator-cum-Typist for NFDB; Establishment of a permanent Regional Office of the NFDB in Guwahati on land allotted by Govt. of Assam; Filling up of vacancies in NFDB; Construction of additional Type-V Residential Quarters at NFDB, etc.

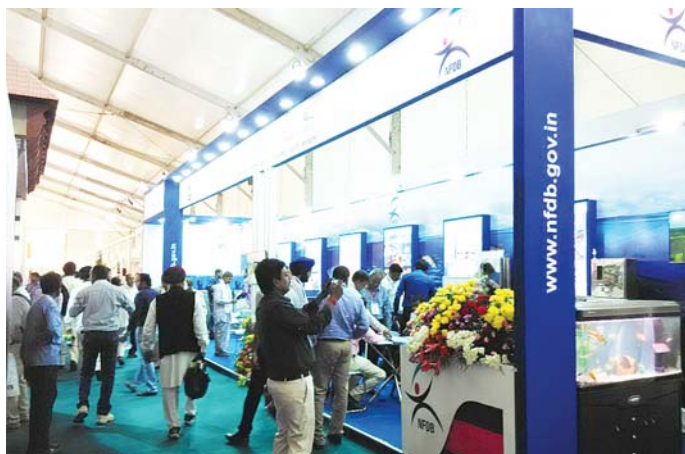


28th Meeting of the Executive Committee of NFDB held on 18th March 2016 at Krishi Bhavan, New Delhi

5.20 NFDB participates in 'Krishi Unnati Mela' organized at IARI, Pusa, New Delhi

The '*Krishi Unnati Mela*', an event to showcase the progress made in Agriculture and allied sectors in the country was organized from 19th to 21st March 2016 at the Indian Agricultural Research Institute (IARI), Pusa, New Delhi. NFDB put a Stall to showcase the various activities and schemes, and fisheries development across the country. Dr. N. John Samuel, Consultant (Tech), Dr. R.N. Gopal, Senior Executive (Tech), Shri P. Bhanu Prakash, Executive Assistant (Tech) and Dr. Ajay Pandey, Consultant (M&E), coordinated, established and managed the NFDB Stall.

Hon'ble Prime Minister of India, Shri. Narendra Modi inaugurated the *Krishi Unnati Mela 2016* on 19th March 2016. Shri K.N. Kumar, Chief Executive, NFDB, Shri A.K. Joshi, Joint Secretary (Fisheries), DAHD&F, Dr. Bhaskar Narayan, Principal Scientist, CFTRI and Shri PVSL Narasimham, CEO, Teewave Technologies, were present at the NFDB stall. On 21st March,



NFDB Stall with exhibits and models displayed at 'Krishi Unnati Mela', IARI, Pusa, New Delhi



Hon'ble Agriculture Minister, Shri Radha Mohan Singh, Shri A.K. Angurana, Dr. Paul Pandian and others at NFDB Stall



Hon'ble Minister going round the Solar powered Fish Drier and other Equipment displayed by Shri PVSL Narasimham, CEO, M/s Teewave Technologies, Hyderabad, in NFDB Stall at 'Krishi Unnati Mela'



Floating Fish Feed Extruder Machine displayed by Mr. Sharanjeet Singh Syal, Proprietor, M/s Unitech Fish Feed Plants, Delhi, at 'Krishi Unnati Mela'

Hon'ble Agriculture Minister, Shri Radha Mohan Singh, Shri A.K. Angurana, Secretary, DAHD&F along with Dr. Paul Pandian, Fisheries Development Commissioner, Govt. of India, and other officials visited the NFDB Stall.

From 19th to 21st March 2016, apart from Secretaries, Joint

Secretaries and other officials of Ministry of Agriculture, several agriculture farmers, fish farmers, entrepreneurs, scholars and civilians visited the NFDB Stall. NFDB team along with other participants explained NFDB schemes and activities apart from explaining the functioning of various models displayed in the NFDB stall.

6. NFDB Field Notes

6.1 Joint Physical Verification of NFDB funded Fish Markets in Andhra Pradesh and Telangana States undertaken

Joint Physical Verification of Wholesale/ Retail Fish Markets for which NFDB provided financial assistance to the local Govt. Bodies in four districts of Andhra Pradesh, was undertaken during January 2016 by a team of: (i) Official from NFDB, (ii) CAG Audit Party comprising of Shri M. Narasimha Murthy, Sr. Audit Officer, Shri K. Sasidhar Babu and Shri M. Trinadha Rao, Asst. Audit Officers, and (iii) representatives/ Engineers of local Govt. Body.

(i) Fish Markets in West Godavari district of Andhra Pradesh not coming up due to land issues

On 18th January 2016, market site proposed for construction of Wholesale Fish Market at BR Market, Tadepalligudem, West Godavari Dist, Andhra Pradesh was inspected by Dr. John Samuel, Consultant (Tech), NFDB, and the Audit Party, along with officials of the Municipality. It was observed that work was not initiated due to some litigation and the matter is in the Honorable High Court. The Implementing Agency informed that the amount released by NFDB will be refunded after final negotiations with the licensed fishermen in the market area.



Site proposed for construction of Wholesale Fish Market at BR Market, Tadepalligudem, West Godavari district, Andhra Pradesh

(ii) Fish Markets in Guntur district of Andhra Pradesh not coming up due to land issues

On 19th January 2016, the team met Municipal Commissioner, Ms. Nagalakshmi, IAS, and Engineers, and verified the status of two fish markets sanctioned to Guntur Municipal Corporation. It was observed that work on the Wholesale Fish Market at Bongaralabeedu, Guntur, was not initiated due to problem with the local residents. Similarly, work on Wholesale Fish Market at Ponnur Road, Guntur, was not initiated due to land dispute. The Implementing Agency informed that the amount will be refunded to NFDB after final negotiations with the local people and in their reply to CAG Audit Team requested for extension of time.

(iii) NFDB Funded Fish Markets in Prakasam district, Andhra Pradesh

On 21st and 22nd January 2016, Wholesale Fish Market at Uracheruvu, Ongole, and Retail Fish Market, Kandukur, Prakasam district, Andhra Pradesh, were inspected by Ms. Deepa Suman, Executive (Tech), NFDB, and the Audit Party, along with officials of the Municipality. An amount of Rs. 109.26 lakh was sanctioned and Rs.87.408 lakh was released by NFDB for Uracheruvu, Ongole, Wholesale Fish Market. On physical verification, it was observed that construction works such as wholesale platforms, retail stalls, cutting and dressing units and sanitary works were completed and the works pertaining to electrification, water supply, ETP, etc., are yet to commence. Commissioner, Municipal Corporation Ongole was apprised of the status.

On 22nd January 2016 the Retail Fish Market at Kandukur, Prakasham district, Andhra Pradesh, was inspected along with the Dy. Engineer. The market is complete in all respects, stalls were allotted to fishermen and fisherwomen vendors and market has been functioning since two years. The vendors informed



Exterior (above) and interior (below) of Wholesale Fish Market at Uracheruvu, Ongole, Prakasam district, Andhra Pradesh



Exterior (above) and interior (below) of Retail Fish Market at Kandukur, Prakasam district, Andhra Pradesh

that drinking water facilities and ice boxes were not provided and the Implementing Agency was asked to provide as originally proposed.

(iv) NFDB Funded Fish Markets in Nellore district, Andhra Pradesh

From 23rd to 25th January 2016 Fish Markets in Nellore district of Andhra Pradesh were inspected by Dr. K. Ravindranath, Sr. Consultant (Tech) and the Audit Party. Shri P.V.V.S. Murthy, IAS, Commissioner, NMC, was appraised about the purpose of the visit. Discussed with Shri D. Sundar Rama Reddy, Dy. Executive Engineer and Ms. Padmaja, Asst. Engineer, NMC, and sought clarification on the observations made by the AG Audit.

NFDB released Rs. 45.00 lakh toward second installment for the Retail Fish Market, Mypadu Road, Nellore; construction work completed, market inaugurated and is now functioning. Physically verified, photographed and feedback obtained from the fisherwomen/ fish-vendors present. Component-wise Statement of Expenditure and UC were sought from the Municipal Engineers.



Mypadu Road Retail Fish Market, Nellore, Andhra Pradesh (above); Fish Retailing Section and Fish Dressing Section (below)

For the existing Fish Market (wholesale-cum-retail) at Dycus Road, Nellore, NFDB sanctioned Rs. 61.20 lakh and released First Installment of Rs. 30.60 lakh toward Extension of Auction Hall in Ground Floor and New construction of First Floor. Physically inspected premises and photographed. Extension of Ground Floor Auction Hall was completed and is being used.

NFDB released Rs. 45.00 lakh toward first installment of Retail Fish Market at Atmakur town, Nellore district. The inordinate delay in execution of work was discussed with Shri Srinivasa Rao, Commissioner, Atmakur Municipality and Shri Sk. Sandani, Vice-Chairman, Atmakur Municipal Council, at the Municipal Office, Atmakur. Clearing unauthorized constructions/ structures from the site earmarked for the fish market caused the delay. Site was inspected, it is free from unauthorized structures, has been leveled, and construction process is to begin shortly.



Dycus Road Fish Market, Nellore, Andhra Pradesh, hygienic maintenance (above), Extended Auction Hall in ground floor and First Floor under construction (below)



Site cleared and ready for construction of Retail Fish Market at Atmakur town, Nellore district, Andhra Pradesh

(v) NFDB Funded Fish Markets in Hyderabad, Telangana State

Joint Physical Verification of four fish markets sanctioned by NFDB to Greater Hyderabad Municipal Corporation, Hyderabad, was undertaken by Dr. John Samuel, Consultant (Tech), NFDB along with CAG Audit Officer, Shri Narasimha Murthy, SAO. On 29th February 2016, visited the sites proposed for construction of Fish Markets at Kukatpally (old and new sites) and Begum Bazar, Hyderabad, and on 1st March 2016, visited the sites proposed for construction of Fish Markets at Nacharam (old and new sites) and Domalguda, Hyderabad. It is observed that at none of the four sites construction work was not initiated, and some local issues were cited as the reason.



Inspection Team interacting with Officials and Traders at Old Market site proposed for construction of Fish Market at Begum Bazar, Hyderabad

6.2 Physical Verification of NFDB funded Fish Markets in Madhya Pradesh undertaken

Physical Verification of Wholesale/ Retail Fish Markets for which NFDB provided financial assistance to the local Govt. Bodies in six districts of Madhya Pradesh, was undertaken from 14th to 20th February 2016 by Dr. N. John Samuel, Consultant (Tech) and Mr. Bhogeshwar Chirwatkar, Intern, NFDB.

Discussed with Shri U.K. Purohit, Director of Fisheries, Dr. U.K. Subuddhi, IFS, Managing Director, and Shri R.K. Choudhary, Manager (Tech), Madhya Pradesh Fisheries Federation (Co-op) Ltd. (MPFFC), and other fisheries officials at the Fisheries Directorate, Bhopal, about NFDB funded schemes and the scope for Reservoir Fisheries Development, Cage Culture, Ornamental Fisheries, etc. Subsequently, the six fish markets constructed with NFDB assistance were physically inspected along with concerned officials.



NFDB Officials meet Shri U.K. Purohit, Director of Fisheries, and other fisheries officials at the Fisheries Directorate, Bhopal

(i) Wholesale Fish Market at Sagar, Sagar district, Madhya Pradesh

NFDB sanctioned and released Rs. 112.50 lakh toward Wholesale Fish Market at Sagar, Sagar district, Madhya Pradesh. The market

was inspected; construction of the fish market is complete; allotment of stalls and shifting of fish vendors are to be done; interacted with district fisheries officials and local fish vendors.



Wholesale Fish Market at Sagar, Madhya Pradesh; front view (above) and fish stall (below)

(ii) Wholesale Fish Market at Satna, Satna district, Madhya Pradesh

NFDB sanctioned Rs. 112.50 lakh and released Rs. 101.25 lakh toward Wholesale Fish Market at Satna, Satna district, Madhya Pradesh. The market was inspected; construction of the fish market is complete; allotment of stalls is to be done; interacted with officials of Municipal Council about allotment and operating the market.



Wholesale Fish Market at Satna, Madhya Pradesh

(iii) Wholesale Fish Market at Rewa, Rewa district, Madhya Pradesh

NFDB sanctioned and released Rs. 112.50 lakh toward Wholesale Fish Market at Rewa, Rewa district, Madhya Pradesh. The market was inspected; construction of the fish market is complete; allotment of stalls is to be done.



Wholesale Fish Market at Rewa, Madhya Pradesh

(iv) Retail Fish Market at Kotma, Annupur district, Madhya Pradesh

NFDB sanctioned Rs. 45.00 lakh and released Rs. 40.50 lakh toward Retail Fish Market at Kotma, Annupur district, Madhya Pradesh. The market was inspected; construction of the fish market was completed and was inaugurated in 2015; however allotment of stalls is yet to be done. In view of expected demand, sheds were erected for the small-scale fish vendors (including dry fish) at the rear side of the main fish market.



A view of the Retail Fish Market at Kotma, Annupur district, Madhya Pradesh

(v) Wholesale Fish Market at Jabalpur, Jbalpur district, Madhya Pradesh

NFDB sanctioned Rs. 185.40 lakh and released Rs. 130.38 lakh toward Wholesale-cum-Retail Fish Market at Jabalpur, Jabalpur district, Madhya Pradesh. The market was inspected; 90% construction work was completed; a total of 15 wholesale and 35 retail stalls are completed.



Front view of the Fish Market (above), Wholesale Stalls (below left) and Retail Stalls (below right) at Jabalpur, Madhya Pradesh

(vi) Retail Fish Market at Seoni, Seoni district, Madhya Pradesh

NFDB sanctioned and released Rs. 90.00 lakh toward Retail Fish Market at Seoni, Seoni district, Madhya Pradesh. The market was inspected; construction was completed, however allotment of stalls is pending.



Front view (above) and inside view of Retail Stall (below) of Retail Fish Market at Seoni, Seoni district, Madhya Pradesh

Ice Plant/ Flake Ice Unit are not installed in all the fish markets; it was informed that they would be installed after allotment of stalls. The concerned Corporations/ Councils are facing problems in allocation of stalls and shifting of traders/ vendors to the new fish markets even after their completion.

6.3 Ongoing Work at National Freshwater Fish Brood Bank, Bhubaneswar, reviewed

The plan for renovation of ponds and strengthening of bunds/dikes at the National Freshwater Fish Brood Bank (NFFBB) Project site of NFDB at Kausalyaganga, Bhubaneswar, Odisha, was approved during the review meeting dated 2nd February 2016, chaired by the Chief Secretary, Govt. of Odisha. Shri D. Gopi Reddy, Senior Executive (Tech), NFDB, visited NFFBB Project site on 8th February 2016 to review the civil works and technical programme. As per the design, 6 cross bunds have been formed in the tank number 15 and 3 more cross bunds have to be formed. However, owing to poor quality and slow pace of work of OCC, it was decided to assign the work to another implementing agency.

Breeder seed rearing and brood stock development activity is in progress. Trial netting has been done in the seed rearing and brooder stock ponds, and a report on the assessment of stock has been prepared based on the observations.



Brood Stock of Catla & Rohu (above), improved Catla breeder seed (below) at NFFBB Project Farm, Bhubaneswar, Odisha

Since Amur Common Carp brood stock matured, it was decided to breed the fishes within 10 days. Further, breeding of Catla and

Rohu too can be undertaken during the forthcoming breeding season. The fish seed hatchery facility with production capacity of about 1.5 to 2.00 lakh fry belonging to Odisha Fisheries Development Corporation (OFDC) situated near the NFFBB was found to be idle. The Additional Director of Fisheries, Govt. of Odisha, in principle agreed to spare the facility to NFFBB Project for time being to take up seed production.



Maturity state of Amur Common Carp Brood Fish at NFFBB Project Farm being assessed

The Technical Core Committee Meeting of the NFFBB Project was held at CIFA, Kausalyaganga, Bhubaneswar, on the same day. Regarding cost of breeder seed produced at NFFBB and to be supplied to the States, the Core Committee recommended adoption of the rates fixed by CIFA for supply of seed of improved variety of various species of fish.



Technical Core Committee meeting of NFFBB Project being chaired by Director, CIFA, Bhubaneswar

6.4 Interactive Meeting with Marine Fishermen held at Danavaipet village, East Godavari district, Andhra Pradesh

Danavaipet is a marine fishing village and headquarter of Gram Panchayat, in Thondangi Mandal of East Godavari district in Andhra Pradesh. Almost all the households are landless and are dependent completely on sea fishing and related activities. Even dairying is almost non-existent in the village.

Dr. S. Subramanyam, Senior Consultant (M&E), NFDB, undertook a socio-economic survey of the Danavaipet village from 11th to 14th February 2016. Shri Ch. Haribabu, Sarpanch of the Gram Panchayat, organized on 10th March 2016 an interactive



Shri K.N. Kumar, Chief Executive, NFDB, interacting with fisher folk during and after the Awareness Meet in Danavaipet, a marine fishing village of East Godavari district, Andhra Pradesh

meeting of the fisher folk in the village with Shri K.N. Kumar, Chief Executive and Dr. S. Subramanyam, NFDB, in which Shri B. Sivamurthy, MPDO, Shri T.V. Suryanarayana, Tehsildar, and other officials and non-officials participated.

The Chief Executive, NFDB, explained to the fishers about the various schemes being implemented and subsidies being provided to marine fishermen, by the Govt. of India and the State Govt., especially on ice boxes, fishing boats and nets, and suggested to



properly avail them. Fishermen of the village requested the Chief Executive for construction of a fish market with cold storage facility. Fisherwomen who are engaged in marketing of fish expressed the need for small loans to carry out their businesses. They stated that they are all members of Self Help Groups and are contributing small amount of their savings. Fishermen undertaking fishing expressed problems in the implementation of diesel subsidy scheme of the Govt. of Andhra Pradesh.

7. Fishers & Farmers News

7.1 NFDB funded awareness programme on 'Fish Disease Surveillance' conducted for farmers in two districts of Uttar Pradesh

Under the NFDB funded research project “*National Surveillance Programme for Aquatic Animal Diseases*”, National Bureau of Fish Genetic Resources (ICAR-NBFGR), Lucknow, conducted awareness programmes on ‘*Fish Disease Surveillance*’, at Barabanki and Lakhimpur-Kheri districts in collaboration with Dept. of Fisheries, Govt. of Uttar Pradesh, on 17th and 21st December 2015, respectively. One hundred ninety nine fish farmers participated in the awareness programme at Barabanki where as at Lakhimpur-Kheri, one hundred sixty two fish farmers participated. The fish farmers were informed about various technologies of freshwater aquaculture, better management practices, viz. proper pond preparation, stocking quality seed, providing balanced feed, etc. With regard to fish disease surveillance, the clinical signs of important as well as emerging fish diseases in freshwater aquaculture were explained. The farmers were advised to report all the disease outbreaks in the initial stages, so that losses due to diseases can be minimized. Speaking on the occasion, the Fisheries Officers of respective districts informed about various Govt. schemes and advised the farmers to take advantage of such schemes.



Fish farmers' participation at the awareness programmes on 'Fish Disease Surveillance' conducted by NBFGR, at Barabanki district (above) and Lakhimpur-Kheri district (below) in Uttar Pradesh

7.2 NFDB funded training on 'Fish Disease Diagnosis and Treatment' conducted at NBFGR, Lucknow

NFDB funded hands-on training programme on '*Fish Disease Diagnosis and Treatment*' was organized at National Bureau of Fish Genetic Resources (ICAR-NBFGR), Lucknow, for State Fisheries Officers of Uttar Pradesh and Haryana, from 1st to 6th February 2016. Eighteen fisheries officers (13 from UP and 5 from Haryana) participated.

The participants were familiarized with Level-I diagnostics, viz, clinical signs and symptoms of important diseases of freshwater fishes. Analysis of water quality parameters using kit and titration methods was also demonstrated. Subsequently, Level-II diagnostic techniques, viz. bacteriology, mycology, parasitology and histopathology. Finally, they were introduced to Level-III diagnostic techniques including virology, DNA and antibody based diagnostics. The officers were made aware of surveillance programme, particularly about the information that needs to be collected and reported, so that the passive surveillance system is strengthened and each disease outbreak is reported and investigated.



Dr. Neeraj Sood, Principal Scientist, explaining diagnostic techniques to Fisheries officials of Uttar Pradesh and Haryana undergoing training on 'Fish Disease Diagnosis and Treatment' at NBFGR, Lucknow, Uttar Pradesh

7.3 NFDB funded training programme on 'Fisheries Perspective in Wetlands (Beels) and their Management' conducted at LRS, AAU, Mandira, Assam

A five-day NFDB assisted training-cum-demonstration programme on '*Fisheries perspective in Wetlands (Beels) and their Management*' was conducted for farmers and *Beel* users from 15th to 19th March 2016 at Livestock Research Station (LRS), Assam Agricultural University, Mandira, Kamrup district of Assam.

Dr. A.K. Chakrabarty, Director of Research (Vety), AAU, Khanapara, Guwahati, Dr. K. Kalita, Professor, Department of Pathology, CVSc, AAU, Kahanapara, Guwahati, Dr. A.K. Barman, Chief Scientist, LRS, AAU, Mandira and Dr. R.Ch. Barman, Officer-in-Charge, Regional Centre, NFDB, Guwahati, took part in the inaugural function. Thirty progressive farmers and *Beel* users participated in the training programme.



Training programme on 'Fisheries Perspective in Wetlands (Beels) and their Management' at LRS, AAU, Mandira, Kamrup district, Assam; Dr. A. K. Chakrabarty DR (Vety), Dr. R. Ch. Barman, NFDB (second and third from left) and Dr. K. K. Kalita, Professor of Pathology, delivering a talk (above) and trainee Beel Users (below)

Objective of the programme was to build the capacity of *Beel* users on scientific management of *Beel* fisheries. An in-depth knowledge was imparted to the *Beel* users on effective management of *Beel* fisheries, by the Professors and Scientists of Assam Agricultural University. Important topics covered were Economic importance of *Beels*, Production enhancement through fish seed stocking, Pen and Cage culture, Soil and Water quality management of *Beels*, Health management of *Beel* fisheries. A field visit and demonstration programme was organized at the nearest *Beel* site. It must be mentioned that within the premises of the 6,000 ha Live Stock Research Station, a large number of small and medium size *Beels* exist. Interaction between farmers and scientists was also arranged during the course of the programme.

8. Fisheries & Aquaculture Industry News

8.1 Short Finned Pilot Whales get stranded on Tamil Nadu Coast

On 12th January 2016, a pod (group) of some 45 (100 according to one count) Short Finned Pilot Whales (*Globicephala macrorhynchus* Gray, 1846) got washed ashore, stranded, and died along the Manappadu Coast, Tuticorin district, Tamil Nadu. Several Govt. agencies and fishermen tried to push most of them back into the sea but in vain. They belong to the dolphin family (Delphinidae), but behave like larger whales; primarily inhabit warm tropical waters, but usually stay offshore in the deeper waters and tend to aggregate in areas with a high density of squids which form their food.



Short Finned Pilot Whales stranded on 13th January 2016, along Tuticorin Coast, Tamil Nadu

According to some marine scientists the whales while searching for food, strayed into shallow waters and got stranded, whereas according to Dr. Arunachalam Kumar (Professor & Head, Dept. of Anatomy, Kanachur Institute of Medical Sciences, Mangalore) pursuing ethology (animal behaviour), cetaceans (whales and dolphins) get disoriented by shifts in the undersea tectonic plates: their cerebral magnetic 'compass', that guides migration and routes, gets disrupted weeks before the plates actually shift or sub-duct, resulting in disorientation, and disruption in their route map which manifests as stranding. On the whole it was a tragic event for these marine mammals.

[Source: <https://en.wikipedia.org>; *The Hindu*; *Rediff.com*;
Photograph: A. Ganesh Nadar]

8.2 Fisheries Research Vessel 'F V Sagar Harita' built by Goa Shipyard sails to Kochi

F.V. Sagar Harita, the 19.80 m, energy efficient New Generation Fishing Vessel, designed and built by Goa Shipyard Limited

(GSL), Goa, for Central Institute of Fisheries Technology (CIFT), Kochi, reached Kochi on 5th March 2016, after successfully completing the sea trials. The vessel has met all requirements of Indian Register of Shipping (IRS) and CIFT.

This new generation energy efficient green fishing vessel, is fitted with latest technology solar panels in line with our national aim to promote Green Energy to reduce the Carbon Foot Print. Solar panels fitted on this vessel, caters the requirement of energy for Navigational lights, Cabin lighting, etc. The vessel also incorporates optimized hull design with bulbous bow, fuel efficient propeller design and improved sea keeping characteristics. Modern tools and techniques like software simulation and model testing has been used for the refinement of the design. Super structure of ship has been made from FRP, using latest "Resin Infusion Technology" thereby significantly enhancing the sea keeping performance.



New generation fishing vessel FV Sagar Harita built by GSL, Goa for CIFT, Kochi

The Central Institute of Fisheries Technology (CIFT), the lead partner in developing the fuel-efficient multi-fishing mode vessel, will take her to waters shortly. The vessel blends research as well as occupational fishing activities. According to Dr. C.N. Ravishankar, Director of CIFT, the new model vessel was developed after detailed surveys across the fishing centres of the country and obtaining feedback from the stakeholders. The vessel was built at Goa Shipyard at a cost of around Rs. 7 crore under the project "Green Fishing System for Tropical Seas" funded by National Agricultural Science Fund of the Indian Council for Agriculture Research. The commercial version of the same design is expected to cost around Rupees One Crore.

[Source: <http://www.goashipyard.co.in>;
<http://www.thehindu.com>]

8.3 National Fishworkers' Forum Members represent to Union Agriculture Minister

A rally was held by National Fishworkers' Forum at Delhi on 10th March 2016 drawing attention towards the important demands of the traditional coastal fisher communities of India. Thousands of fisher people from the coastal States of Gujarat, Tamil Nadu, Kerala, Maharashtra, Andra Pradesh, Pondicherry, Odissa, Karnataka, Diu and Daman and West Bengal gathered at Jantar Mantar, New Delhi. Later, Shri Radha Mohan Singh, Hon'ble Minister for Agriculture invited the leaders of NFF to meet him and received the memorandum containing the important demands of fishers. Again the Hon'ble Minister invited the leaders of NFF on 18th March 2016 for a meeting at Krishi Bhavan, New Delhi.



[Source: www.nffindia.org]

8.4 CAA invites EOI for Recognition of Disease Diagnostic Laboratories through Capacity Building and Harmonization

The Coastal Aquaculture Authority (CAA), Govt. of India, through a notification dated 25th February 2016, invited Expression of Interest (EOI) for recognition of Disease Diagnostic Laboratories through capacity building and harmonization in PCR diagnosis of shrimp pathogens and ring testing. Coastal aquaculture, especially shrimp farming, is an important economic activity carried out in the entire coastal belt of the country. Coastal Aquaculture Authority (CAA) is empowered to regulate all the activities connected with coastal aquaculture in coastal areas and one of the functions is to fix standards for all coastal aquaculture inputs viz. seed, feed, growth supplements as well as chemicals/ medicines, etc. Production of healthy and disease free shrimp

seed is the foremost requirement for sustainable shrimp farming and the Guidelines for *L. vannamei* farming stipulate that tested and certified seed should be procured from the hatcheries and shrimp farmers would be required to test the seed from approved PCR laboratories only.

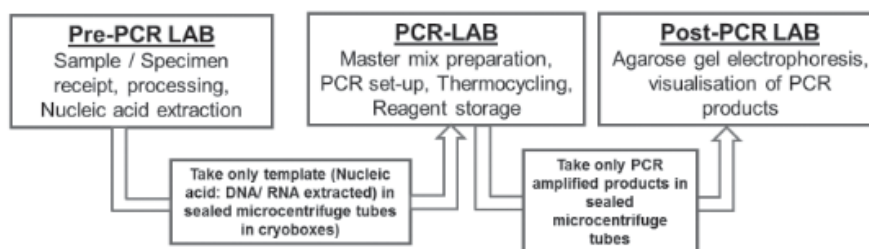
Findings of the disease surveillance programme carried out by the Central Institute of Brackishwater Aquaculture (CIBA) indicate that the White Spot Syndrome Virus (WSSV) still causes major mortalities and production losses, the Infectious Hypodermal and Hematopoietic Necrosis Virus (IHHNV) is also widely prevalent. Recently, the microsporidian *Enterocytozoan hepatopenaei* (EHP) is reported to be occurring in a same pattern throughout the coast. Early pathogen detection is a crucial measure in preventing disease spread in shrimp aquaculture system and the DNA based polymerase chain reaction (PCR) technique is widely used as a major diagnosis tool for shrimp pathogens. However, there are various issues related to the application and the reliability of PCR diagnostic results due to the inconsistencies in the testing methods and the results mainly on account of lack of different levels of technical competency and technicians themselves are unable to prove beyond doubt the veracity of the diagnostic tests and the procedures adopted.

CAA, with the active technical support and cooperation of CIBA and RGCA, has taken the initiative to address the issue of training the technical personnel involved in PCR diagnostic laboratories involved in the field of aquatic animal health management as well as in the approved hatcheries through an intensive capacity building drive at three levels.

Certification

The PCR laboratory should pass all the three levels successfully to be designated as "approved" / "recognized" laboratory. After the successful completion of the training and ring test, an approval/ recognition certificate will be issued to the participating laboratories by ICAR Central Institute of Brackishwater Aquaculture (CIBA), Marine Products Development Authority (MPEDA)/ Rajiv Gandhi Centre for Aquaculture (RGCA) and Coastal Aquaculture Authority (CAA). The validity of the approval/recognition is for a period of one year, and to renew the "approved" / "recognized" status, each laboratory must undergo the ring test every year.

Ideal PCR Laboratory plan



[Source: www.rgca.org.in]

9. NFDB News

9.1 Review Meeting on NFDB assisted projects held with Officers of Implementing Agencies in Karnataka

NFDB provided financial assistance to different Agencies/ Undertakings of the Govt. of Karnataka, during the year 2010-11 to 2014-15, for the construction of 29 fish markets. A meeting to review the status of those fish markets was held with all the Implementing agencies at NFDB on 18th February 2016.

Shri H. S. Veerappa Gowda, Director of Fisheries, Karnataka, Shri V.K. Shetty, Managing Director, Karnataka Fisheries Development Corporation (KFDC) & Managing Director, Karnataka State Co-operative Fisheries Federation Ltd., Shri Pradeep Desouza, Secretary, Coastal Development Authority, Mangalore, Shri N. Raju, Addl Commissioner, Mysore City Corporation, Deputy Commissioner, Bellary City Corporation, Officials of Mangalore City Corporation, attended. Shri G. Vijaya Lazarus, Sr. Executive (Tech-Infra), Shri D. Gopi Reddy, Sr. Executive (Tech) and Ms. J. Deepa Suman, Executive (Tech), from NFDB participated. The Officers from Karnataka informed that of the 29 fish markets sanctioned, construction of 12 was completed, 15 are under progress and 2 have been shelved by KFDC.



NFDB officers reviewing fish markets works with Officials from Karnataka

9.2 School children organise Science Exhibition in NFDB premises

Era Talent School, located in nearby Shivarampally, Rajendranagar, Hyderabad, organised a Science Exhibition in the NFDB premises on 19th and 20th February 2016, which was inaugurated by Shri K.N. Kumar, Chief Executive, in the presence of the Officers and Staff of NFDB. The school children exhibited various models prepared by them related to science and society, including environmental issues, water cycle, live ornamental fishes, a replica of NFDB Fish Building, etc. School children, teachers, parents, public from the surrounding localities went round the exhibits and enquired about their significance from the exhibiting students.



Some of the models put up by school children in the Science Exhibition held in the premises of NFDB

9.3 Review Meeting held with KSCADC Officers from Kerala

NFDB provided financial assistance to Kerala State Coastal Area Development Corporation Limited (KSCADC), Thiruvananthapuram, Kerala, for the construction of 41 fish markets. A meeting to review the status of Wholesale/Retail Fish Markets in Kerala State was held on 23rd March 2016, in the Chamber of the Chief Executive, NFDB. Dr. Ampady, Managing Director, and Dr. Rajeev, Engineer from KSCADC, Shri G. Vijaya Lazarus, Sr. Executive (Tech-Infra), Dr. Manne Persis, Sr. Executive (Tech), Ms. J. Deepa Suman, Executive (Tech), and Shri M. Vishwas Rao, Jr. Consultant, from NFDB participated in the review meeting. The Managing Director, KSCADC, informed that of the 41 markets sanctioned, construction of 34 has been completed, 03 are under progress and 04 have been shelved owing to site allocation problem and non-subsidy portion of funds being not sanctioned by Govt. of Kerala.



Chief Executive reviewing fish markets works with Officials of KSCADC and Officers of NFDB

9.4 Technical and Administrative Officers Appointed at NFDB

The following Administrative and Technical Officers were appointed at NFDB, Hyderabad:



Name & Designation	Date of Joining
Shri Subrat Dash, Sr. Executive (Tech) [at NFFBB, Bhubaneswar]	04-01-2016
Shri B.V. Balaji, Senior Executive (F&A)	03-02-2016
Dr. Utpal Kumar Sar, Executive Director (Tech)	01-03-2016
Shri Apurba Kumar Das, Senior Executive (Tech)	11-03-2016
Dr. Sanjay Sharma, Senior Executive (Tech)	11-03-2016

9.5 Process for fresh recruitment of Executive Assistants in NFDB initiated

Consequent to the notification issued for fresh recruitment of entry level posts of Executive Assistants (Technical) [professional fishery science graduates and postgraduates] and Executive Assistants (Finance & Administration), applications received were scrutinized and 394 candidates were shortlisted for the

Written Test which was conducted at Seven Examination Centres: Hyderabad, Visakhapatnam, Guwahat, Kolkata, New Delhi, Mumbai and Chennai. In all 239 candidates [127 EA (T) + 112 EA (F&A)] appeared for the Written Test.

Among the 127 EA (T) candidates, 13 have been shortlisted for group discussion & personal interview scheduled for 15th April 2016, and among the 112 EA (F&A) candidates, four have been shortlisted for personal interview scheduled for 21st April 2016.



Written Test for recruitment of Executive Assistants in NFDB, underway at Hyderabad Centre

10. NFDB in the Media

मछली मार्केट देखने हैदराबाद से आई टीम
जल्द होगा लोकार्पण, बाजारों से हटेंगी मछली की दुकानें

हरद के प्रमुख बाजारों में लटक के विस्तार करने वाले मछली के बाजार को जल्द ही सुव्यवस्थित बनाया जाएगा। हैदराबाद के विज्ञान एवं प्रौद्योगिकी मंत्रालय के अधिकारी मछली मार्केट का भ्रमण कर रहे हैं।

26 दुकानें बनाई गईं
मछली बाजारों के लिए 26 दुकानें बनाई गई हैं। बाजारों में मछली की दुकानें हटाने का निर्णय लिया गया है।

Silchar gets new fish market
CORRESPONDENT
SILCHAR, April 30 - The inaugural function of the modern and hygienic wholesale fish market at New Market inside the Fatak Bazar here on Wednesday witnessed chaotic scenes between the Bharatiya Janata Party and the Congress.

DISTRICT DIGEST Bishnupur, Mar 21
FFDA organises
As part of the project "Augmentation of fish production of Loktak Lake with stocking of fish fingerlings", the Fish Farmers' Development Agency has organised a programme under the sponsorship of the National Fisheries Development Board (NFDB), Hyderabad today.

छैःनाडू चारुगुडाम
रायचेलम सड्डायोराग चैसुकीनार



11. Announcements

11.1 Book Published

‘Advances in Fish Disease Diagnosis and Fish Health Management’. Editors: B. Kalita and A. Ali, Published by College of Fisheries, Assam Agricultural University, Raha, Nagaon, Assam, pp. i-ix + 321 + 4 Plates. (Published with financial support from NFDB under HRD Training Programme)

11.2 The 7th World Fisheries Congress - 2016

The ‘7th World Fisheries Congress’ is to be held in Busan, Korea, from 23rd to 27th May 2016. The theme of the Congress is ‘Challenge to Sustainable Fisheries and Safe Seafoods’. [Source: www.wiseoceans.com]

11.3 Aquaculture UK 2016

To be organized on 25th and 26th May 2016 at Aviemore, Scotland, UK. Now in its 10th year, Aquaculture UK is the most important aquaculture exhibition and conference held in the British Isles. Aquaculture UK offers exhibitors a valuable opportunity to launch new products, meet decision makers and promote their products and services. All the major aquaculture countries are represented by exhibitors and visitors and they both emphasize the excellent atmosphere and open and friendly interaction that they enjoy at Aquaculture UK.

11.4 Middle East Central Asia Aquaculture 2016

To be organized from 2nd to 4th June 2016 in conjunction with Future Fish Eurasia at Izmir Expo Center, Izmir, Turkey. Created in 2015, the Middle East & Central Asia Aquaculture (MECAA15) saw its first edition in Tehran, Iran. MECAA16 brings together aquaculture industry experts and academics from the Middle East, to showcase the latest products and offer industry professionals a state-of-the-art platform to interact. The

MECAA16 programme includes specific topical industry sessions, technical sessions, facilitated workshops and panel discussions and provides a unique networking platform to industry professionals and aquaculture academics.

11.5 The 17th International Symposium on Feeding and Nutrition in Fish

To be organized from 5th to 10th June at Sun Valley Resort, Ketchum, Idaho, USA. The Symposium is an international conference of fish nutritionists from academia, government and industry. The Symposium is held every two years and draws about 500 participants. Over the five-day meeting there will be nine half-day sessions encompassing current important topics in fish nutrition and feeding, with four invited lectures, 90 oral presentations and 250 posters.

[Source: www.was.org]

11.6 Fish Breeder’s Round Table

To be organized on 14th and 15th June 2016 at Scandic Ishavshotel, Tromsø, Norway. Fish Breeders’ Round Table is a meeting for global aquaculture breeding industry and research organisations, where the program is set up to allow for plenty of discussion. All participating organisations must present results, but no abstracts are required.

[Source: www.thefishsite.com]

11.7 Training/ Skill Development Programmes & Exposure Visits Sanctioned by NFDB

During the period January to March 2016, NFDB sanctioned the following Training/ Skill Development Programmes & Exposure Visits to various States:



Table - 1: Training/ Skill Development Programmes Sanctioned by NFDB*

Sl.No.	State/ UT	Implementing Agency	Title of Programme	Duration	Number of Trainees
1	Andhra Pradesh	Krishi Vigyan Kendra, S.V. Veterinary University, Undi, West Godavari district	Training and awareness programme on 'Breeding, farming and management of Murrel fish'	1 day	90 trainees in 3 batches (@30/ batch)
2	Andhra Pradesh	Krishi Vigyan Kendra, ANGR Agricultural University, Nellore	Training programmes on: (i) 'Carp culture and Scampi culture', (ii) 'Pangas fish culture techniques', (iii) 'Tiger prawn and Vannamei culture techniques'	5 days	100 farmers: for (i) from Somarajupalli and Indukurupeta villages, for (ii) from Damaramadugu, Kagulapadu and Buchireddipalem villages and for (iii) from Pudiparthi, Koruturu and Indukurpeta villages, in 5 batches (@20/ batch)
3	Assam	College of Fisheries, Assam Agricultural University, Raha	Training programme on 'Development of managerial skills of fishery extension workers for improving fisheries and aquaculture sector of Assam'	7 days	20 Extension Workers in one batch
4	Chhattisgarh	Dept. of Fisheries, Govt. of Chhattisgarh, Raipur	Training programme on 'Intensive fish farming'	5 days	270 fishermen/ fish farmers of Raipur, in 9 batches (@ 30/ batch)
5	Haryana	Director of Fisheries, Govt. of Haryana, Panchkula	Training and demonstration on 'Diversifying traditional fish culture to high valued fish culture such as White Shrimp (<i>L. vannamei</i>) farming; Ornamental Fish breeding; Utilization of untapped water resources such as water logged areas, marshy areas, sewage and saline soil water for Aquaculture, and income generation'	5 days	400 fish farmers in 16 batches (@25 trainees/ batch) in two phases



6	Himachal Pradesh	Director-cum-Warden of Fisheries, Govt. of Himachal Pradesh, Bilaspur	Training programme on 'Reservoir Management'	3 days	900 fishermen (license holders): 360 from Govind Sagar, 60 from Chamara Reservoir, 30 from Ranjeet Reservoir and 450 from Pong Reservoir, in 30 batches (@ 30/ batch)
7	Jammu & Kashmir	Faculty of Fisheries, Sher-e-Kashmir University of Agricultural Sciences and Technology, Rangil, Ganderbal district, Kashmir	Training programme on 'Fish processing and value addition of fish'	3 days	20 fishermen of Ganderbal district in one batch
8	Jammu & Kashmir	Director of Fisheries, Govt. of Jammu & Kashmir, Srinagar	Training on 'Hygienic handling of fish and their value addition'	1 day	500 fishermen/ women in 20 batches (@ 25/ batch/ day)
9	Jammu & Kashmir	Director of Fisheries, Govt. of Jammu & Kashmir, Srinagar	Training programme on 'Seed rearing in pens, cages and ponds, and Reservoir Fishery Management'	5 days	200 fishermen in 8 batches (@ 25/ batch)
10	Jammu & Kashmir	Director of Fisheries, Govt. of Jammu & Kashmir, Srinagar	Training and demonstration in Trout/ Carp fish rearing in newly established farms	5 days	200 fish farmers in 8 batches (@ 25/ batch)
11	Kerala	Krishi Vigyan Kendra, Central Marine Fisheries Research Institute, Ernakulam, Kochi	Transfer of Technology/ Hands-on Training on 'Pearl Spot seed production – pond preparation and nursery rearing activity'	3 days	20 farmers in one batch
12	Maharashtra	Marine Biological Research Station, Dr. Balasaheb Sawant Konkan Krishi Vidhyapeet, Zadgaon, Ratnagiri	Training programme on 'Value added fish products from low cost fish and shrimp'	5 days	120 Fisher folk community/ unemployed youth/ entrepreneurs and SHGs (@ 20/ batch)
13	Maharashtra	College of Fishery Science, MA&FSU, Nagpur	Training and demonstration on 'Value added fish products'	5 days	120 women beneficiaries in 6 batches (@20/ batch)
14	Odisha	Kalinga Institute of Social Sciences (KISS), Patia, Bhubaneswar	Skill development training programme on: (i) 'Freshwater Carp Culture' and (ii) 'Carp Brood Stock Management and Quality Seed Production'.	5 days each	500 ST/ Weaker Section youth from Tribal districts of Odisha: for (i) in 15 batches and for (ii) in 10 batches (@ 20/ batch)



15	Odisha	Director of Fisheries, Govt. of Odisha, Cuttack	Training and skill development in 'Brackishwater finfish and shellfish aquaculture'	5 days	300 fish farmers and entrepreneurs from 7 districts, in 15 batches (@ 20/ batch)
16	Tamil Nadu	Ayya Nadar Janaki Ammal College, Madurai Mamaraj University, Sivakasi	Training programme on 'Ornamental fish culture'	5 days	20 rural beneficiaries from Sivakasi in one batch
17	Telangana	Joint Managing Director, Telangana State Fishermen Cooperatives Federation, Govt. of Telangana, Hyderabad	Training on 'Hygienic handling and fish dressing'	3 days	1000 beneficiaries, 100 from each district of the State (@ 20/ batch)
18	Uttar Pradesh	Dept. of Fisheries, Govt. of Uttar Pradesh, Lucknow	Training in 'Intensive Aquaculture in ponds and tanks'	5 days	380 farmers (new lease-holders of fish ponds) from 5 districts of UP: Faizabad, Sultanpur, Amethi, Azamgarh and Balia, in 13 batches (@ 30/ batch)
19	Uttar Pradesh	Dept. of Fisheries, Govt. of Uttar Pradesh, Lucknow	Residential training-cum-demonstration on 'Fish Productivity enhancement and technology dissemination' at Eklavya Matsya Prashikshan Evam Anusandhaan Kendra, Uttar Pradesh	5 days	750 fish farmers (new lease-holders of fish ponds/ private pond owners/ fish farmers/ fish hatchery owners from 21 districts of UP, in 30 batches (@ 25/ batch)
20	West Bengal	Sasya Shyamala Krishi Vigyan Kendra, Ramakrishna Mission Vivekananda University, Narendrapur, Kolkata	Training and skill development programme on 'Magur culture and seed production'	5 days	100 fish farmers of South 24-Parganas district, in 5 batches (@20/ batch)
21	West Bengal	Sasya Shyamala Krishi Vigyan Kendra, Ramakrishna Mission Vivekananda University, Narendrapur, Kolkata	Training and skill development programme on 'Bhetki farming'	5 days	100 fish farmers of South 24-Parganas district, in 5 batches (@20/ batch)

***Note:** The Implementing Agencies are requested to send write-ups, activity photographs (JPEG/ JPG), scanned newspaper clippings, etc., pertaining to NFDB sponsored/ funded (1) Training/ Skill Development Programmes, (2) Exposure Visits, (3) Events (4) Projects, etc., by E-mail to: matsyabharat@gmail.com



Table - 2: Exposure Visits Sanctioned by NFDB*

Sl.No.	State/ UT	Implementing Agency	Exposure Visit	Duration (excluding journey)	No. of Fish Farmers/ Officers
1	Assam	National Institute of Rural Development & Panchayati Raj, Northeast Regional Centre, Guwahati	To Jharkhand, for building awareness on Best Management Practices in Cage Culture Technology	5 days	234 farmers from Northeastern States accompanied by 15 officers in 5 batches (@ 40-50 farmers & 3 officers/ batch)
2	Haryana	Director of Fisheries, Govt. of Haryana, Panchkula (through CIFE)	To Vijayawada and Nellore, Andhra Pradesh, to acquaint with latest technologies adopted by fish farmers in these regions, for diversification from Carp culture to shrimp culture and establishment of hatcheries and feed mill, etc. in Haryana	5 days	60 progressive fish farmers and 12 Dept. Officials in 6 batches (@ 10 farmers & 2 officers/ batch)
3	Himachal Pradesh	Director-cum-Warden of Fisheries, Govt. of Himachal Pradesh, Bilaspur	To Lonovala, Maharashtra, to acquaint with brood stock management and breeding of Golden Mahseer	10 days	10 Officers of Dept. of Fisheries, Himachal Pradesh
4	Himachal Pradesh	Director-cum-Warden of Fisheries, Govt. of Himachal Pradesh, Bilaspur	To Jharkhand and Chhattisgarh, to acquaint with Cage Culture practices	10 days	Two Officers of Dept. of Fisheries and 10 stakeholders of Gobind Sagar and Pong Reservoirs in Himachal Pradesh
5	Sikkim	Director of Fisheries, Govt. of Sikkim, Gangtok	To Indo-Norwegian Trout Fish Farm at Patlikuhl, Kullu-Manali NH, Himachal Pradesh, to acquaint with Rainbow Trout fish production	10 days	10 Officers of Dept. of Fisheries, Sikkim
6	Sikkim	Director of Fisheries, Govt. of Sikkim, Gangtok	To Jammu & Kashmir, to visit Trout Rearing Units at Kokernag, Achabal, Tricker, Pahalgam, Verinag, Laribal and Harwna and acquaint with BMPs in Trout farming	10 days	10 Officers of Dept. of Fisheries, Sikkim
7	Sikkim	Director of Fisheries, Govt. of Sikkim, Gangtok	To Himachal Pradesh Trout Farming Units, to acquaint with problems currently faced by farmers and possible remedial measures to be taken for optimization of production	10 days	30 progressive fish farmers from Sikkim
8	Sikkim	Director of Fisheries, Govt. of Sikkim, Gangtok	To Jammu & Kashmir Trout Farming Units, to acquaint with problems currently faced by farmers and possible remedial measures to be taken for optimization of production	10 days	30 progressive fish farmers from Sikkim

Matsya Samridhi



National Fisheries Development Board

Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture and Farmers Welfare, Govt. of India

"Fish Building" Pillar No:235, PVNR Expressway, SVPNPA Post, Hyderabad-500052

Tel: + 91 - 040 - 24000103/24015553; Fax: + 91 - 040 - 24015568/24015552

E-Mail: info.nfdb@nic.in; Web: <http://nfdb.gov.in>,

Toll Free Telephone Number :1800-425-1660



Application for Financial Assistance

(A) General Information:

1	Name of Applicant / Organization								
	S/o / D/o / W/o								
2	Status	Farmer	Fisher	FCS	SHG	Entrepr.	State Govt.	Quasi Govt.	Others (*)
3	Category(*)	General	OBC	SC	ST	Women	Differently abled	Minority	Others
4	Address		Address for communication				Project Address		
	Door no / Street								
	Village/Mandal/Taluk								
	District, State, Pin code								
	Land Phone:		Mobile:				E-mail:		

(B) Project Details:

5	Name of the activity									
6	Assets available (*)	Land	Own	Lease	Building	Yes	No	Machinery	Yes	No
7	Whether trained / Experienced in relevant field	Yes	No	8. Whether any assistance received earlier for similar project				Yes	No	
9	Components		Details			No of Units	Unit Cost (Rs.)		Total Cost (Rs.)	
	(a) Capital Cost									
	(b) Operational Cost									
	(c) Total									
10	Source of Funds (Rs.)		Bank Loan (*)			Own Finance	NFDB Assistance		Total (Rs.)	
11	Expected Output		Production (Kgs)			Gross Income (Rs.)		Net Income (Rs.)		
12	No. of Beneficiaries		General	OBC	SC	ST	Minority	Women	Others	
13	Whether Project Report enclosed , If project cost is more than Rs. one lakh (*)							Yes	No	

(*) Enclose relevant documents/Photographs etc.,

(C) **Declaration of Applicant:** This is to certify that, I/we son/daughter of hereby declare that the information furnished above is true to my knowledge and belief and all relevant documents are enclosed.

Date:

Place:

Signature:

(D) **Declaration of Recommending/ Implementing Agency:** This is to certify that, the information furnished by the applicant has been verified. The project is technically feasible and economically viable. The project is recommended for sanction for Rs.Lakh (Rupees.....) as assistance from NFDB. The project will be periodically monitored. The UC in prescribed GFR format alongwith progress report, photographs etc., will be furnished every quarter to NFDB. The bank details are given below.

14	Account Holder Name	Name of the Bank	Branch	Account no	Bank IFSC Code

Date:

Place:

Signature:
Designation

For NFDB Use

Date of Receipt	Dak Number	Enclosures	Sanction	
			Date	Amount



National Fisheries Development Board

(Department of Animal Husbandry, Dairying & Fisheries,
Ministry of Agriculture and Farmers Welfare, Govt. of India)
Fish Building, Pillar No. 235, P.V. Narsimha Rao Expressway
Sardar Vallabhai Patel National Police Academy (SVP NPA) Post
HYDERABAD – 500 052

Ph: 040-24000201; Fax: 040-24015568, 24015552

Toll Free Number: 1800-425-1660

Facebook: www.facebook.com/nfdbindia

Website: <http://nfdb.gov.in>

Give your feedback to:
matsyabharat@gmail.com

