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CIFRINEWS

सिफरी समाचार

Dr. T. Mohapatra, DG, ICAR visiting Bengaluru RRC

Director is receiving cashless ICAR institute award

National Seminar on Priorities in Fisheries and Aquaculture

71st Foundation day and commencing of Platinum Jubilee Year celebration of the institute

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हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद
Agrisearch with a human touch

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Director's Column

The institute has completed 70 years of its glorious journey and Platinum Jubilee year celebration has began on institute foundation day, 17th March. To begin with we have organized a National level Seminar at CoF, Rangeilunda, Odisha during March. A number of other programmes have been lined up to commemorate the occasion. I congratulate all CIFRIans on this special occasion.

Interesting studies have been conducted during this period on breeding of croaker, Puntius and small catfishes; traditional fishing traps; fisheries of Koraphuzha estuary; primary production and production potential of fishes in reservoir and stunted carp fingerlings raising by pens in beels. Database has been created on micronutrient and fatty acid profile of food fishes. The scientists assessed the role of fishery in livelihood support and role of small indigenous fishes in nutrition of fisher women.

The institute received the 'cashless ICAR institute award' and some Scientists got best oral and poster presentation award at the national Seminar at CoF, Rangeilunda. The sports contingent of the institute brought laurels for the institute in the ICAR Eastern Zonal Sports. Ms. Sibina S. Mol was adjudged the Best Woman Athlete in the event. I congratulate all of them. I welcome suggestions from the learned readers to improve the quality of the Newsletter.

June, 2017

Dr. B. K. Das
Director

About ICAR-CIFRI

Started as Central Inland Fisheries Research Station in March, 1947 at Barrackpore, West Bengal, ICAR-CIFRI has carved a niche in inland fisheries research. Induced fish breeding, composite fish culture and other scientific fish production practices developed during the sixties by the Institute helped in bringing the blue revolution in the country. Reservoirs and wetland fisheries management technologies developed and disseminated by the institute resulted in enhanced fish production from these resources. By the turn of the year 2000, the research and development agenda of the institute concerning inland open waters shifted from fish as the only benefit to ecosystem health and ecological benefits with emphasis on sustainability, livelihood and nutritional security. In addition to the Headquarters at Barrackpore and two Research Stations at Kolkata and Kochi, CIFRI has four Regional Research Centres at Allahabad, Guwahati, Bengaluru and Vadodara, through which the issues of inland open water fisheries are being addressed.

Publication Team

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National Seminar

National Seminar on "Priorities in Fisheries and Aquaculture"

ICAR-Central Inland Fisheries Research Institute, Barrackpore, in collaboration with College of Fisheries, OUAT, Rangeilunda, Odisha; Inland Fisheries Society of India and Fisheries College Alumni Association (OFCAAR) organized the National Seminar on "Priorities in Fisheries and Aquaculture" at College of Fisheries, Rangeilunda, Berhampur, Odisha during 11-12, March 2017. Shri Bishnupad Sethi, IAS, Commissioner cum Secretary, Dept. of Fisheries, Government of Odisha was the Chief Guest in the inaugural session.

Inauguration of the Seminar

Address of the Chief Guest

Dr. B.K. Das, Director ICAR-CIFRI, Barrackpore and Convenor of the National Seminar gave a brief account of the purpose and objectives of the seminar. Dr. Jitendra Kumar Sundaray, Director, ICAR-CIFA, Bhubaneswar, Dr. (Mrs) S. Mishra, Director, College of Fisheries, Rangeilunda, Dr. N. P. Srivastava, Secretary, Inland Fisheries Society of India, Kolkata, Dr. N. Sarangi, former Director, ICAR-CIFA, Bhubaneswar, Dr. S. Dam Roy, Director, ICAR-CIARI, Port Blair, Andaman and Nicobar Island also spoke on the occasion. Shri P. R. Rout, President, Odisha Fisheries Services Association and Ms. Urvashi Behera, Additional Director, Department of Fisheries also addressed the participants.

Dr. J. K. Jena, Deputy Director General (Fisheries Science), ICAR, New Delhi in his presidential address, emphasised on the responsibilities of the institutes in realising the blue revolution and achieving developmental targets. He also stressed upon the need for doubling farmers' income involved in aquaculture and fisheries. On this occasion, Souvenir, Book of Abstracts, two Technical bulletins, Hindi magazine *"Nilanjali"* and "OFCAAR Alumni Profile Book" were released. OFCAAR website was also hosted by the DDG.

Address by the DDG (F.Sc.)

Address by the Convenor of the National seminar

Around five hundred delegates participated and 230 papers were presented in four parallel technical sessions (Oral & Posters). On 12 March, Shri Jayanta Sahastrabuddhe, National Organising Secretary, *Vignan Bharti* delivered 3rd P. C. Thomas lecture on dissemination of scientific knowledge. Dr. Dilip Kumar, Former V.C. and Director, ICAR-CIFE, Mumbai

and FAO expert delivered lead lecture on "Making fisheries and aquaculture more relevant to rural development". Dr. S. D. Tripathi, Former Director, ICAR-CIFE, Mumbai also delivered lead lecture on "Human Resource Development in Fisheries". Exhibitions, showcasing various fisheries and aquaculture products and technologies of different institutes and state fisheries department were also arranged.

Research Highlights

First record of *Trichogaster lalius* in Cauvery River system

Trichogaster lalius, popularly known as "Dwarf gourami" belonging to family Osphronemidae is native to Bangladesh, Nepal, Pakistan and Eastern and North-eastern India (Arunachal Pradesh, Assam, Bihar, Manipur, Uttaranchal, Uttar Pradesh and West Bengal). Feral populations also exist in other countries, including Singapore, USA and Colombia. The fish is traded as an ornamental fish in India. *Trichogaster lalius* has been reported for the first time from Thippagondanahalli reservoir. The reservoir, also known as Chamarajsagar, is constructed across Arkavathy river, a tributary of Cauvery river and is located around 35km west of Bengaluru, India (12.9742°N, 77.3475°E). The area at FRL is 1162 ha. This is the first report of *T. lalius* from the Cauvery river system. Total of nine specimens were collected in various seasons. The fish occurs in sparse density in the reservoir. This fish has not been recorded from other Cauvery river basin reservoirs like Krishnarajasagar and Mallaghatta. Based on the morphometric and meristic characters, the specimens were identified. According to IUCN list this species is coming under 'Least concern' status.

Trichogaster lalius

V. L. Ramya, Sibina Mol S, D. S. Krishna Rao, P. Panikkar and M. E. Vijayakumar

Reproductive plasticity of an amphidromous croaker *Johnius coitor* (Hamilton, 1822) in river Ganga under changing climate

A study was conducted in three sampling stations over river Ganga: Patna, Farakka and Triveni during April, 2015-September, 2016 to investigate the reproductive biology of an amphidromous croaker *Johnius coitor*. The research was further deepened by identifying the climatic preference for breeding and assessing the likely impacts of changing climate. The species showed high spatial variation in reproductive phenology and capability of breeding during pre-monsoon, monsoon, post-monsoon and winter. Water temperature is the most crucial environmental parameter influencing gonadal maturation and breeding. Models revealed water temperature near 23-25°C and threshold GSI >3 units were necessary for breeding. Pre-spawning fitness (Fulton's condition factor) and size at 50% maturity, benchmarked through models, were in the range of 1.27-1.37 units and 19.0-24.5 cm respectively. First maturity of female was encountered at 11.4 cm within the size range 7.2-28.5 cm. Mapping of climate preferenda hinted water temperatures <20°C and >32°C to be detrimental for attainment of pre-spawning fitness while no dependence of the species on rainfall was observed. In general, the species seem to have high reproductive plasticity and minimal climate driven changes in breeding phenology of this amphidromous fish species was observed.

Johnius coitor

U. K. Sarkar, G. Karnatak, D. Sudheesan, S. Das Sarkar, K. Roy, Arun Bose, Sourav Nandy, Sandipan Gupta, P. K. Srivastava and Vinod Kumar

"Aatol", a traditional fishing trap of Sundarban

'*Aatol*', a box trap, is a traditional passive fishing device popularly used in canal systems of Sundarbans during monsoon months. The trap is fabricated in different sizes depending upon the maximum water level in canals. The construction materials generally used are different sizes of bamboo strips and small mesh multifilament nets, depending upon their uses in '*lotic*' and '*lentic*' environment, respectively. This is a rectangular shaped trap with a longitudinal trap door made of finely knitted bamboo screens at one end which lead in to a narrower sac. A small opening in the posterior part of top surface is kept for removing trapped fishes. The popular size of '*Aatol*' is 30" × 14" × 24" by length, breadth and height, respectively. The peak season for this '*Aatol*' fishing is from June to September in Sundarbans, when the canals are regularly inundated through numerous feeder channels due to rising water level in rivers.

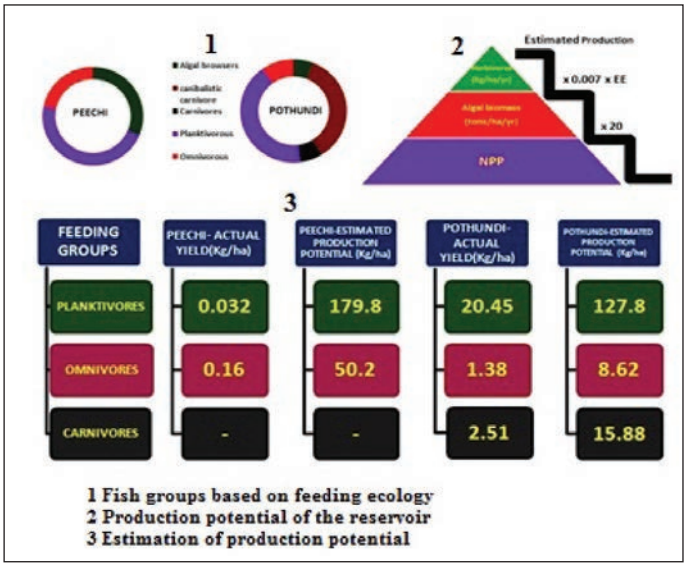
The fishers generally set '*Aatol*' overnight. An average catch of 250–500g/*Aatol*/night is fished from canals during monsoon months with a little effort. Now-a-days, majority of people use net screens with net '*Aatol*' because of low cost involvement. The fishes mostly trapped in '*Aatol*' are *Channa* spp. *Mastacembelus* sp., *Macrognathus* sp., *Trichogaster* spp., *Puntius* spp. *Nandus* sp., *Amblypharyngodon mola*, *Chanda nama*, *Parambassis* spp., *Glossogobius* sp., cat fishes mainly *Mystus* spp. and small prawns.

Aatol (Bamboo made)

Pranab Gogoi, S. K. Das, R. K. Manna, T. N. Chanu, S. K. Koushlesh and M. Ramteke

Potential of planktivore cyprinids in Peechi and Pothundi reservoirs of Kerala

The planktivores in Peechi reservoir, represented mainly by indigenous cyprinid fishes, were exploited only to the tune of 0.032 kg/ha against the estimated production potential of 179.80 kg/ha. This indicates an under-utilized trophic level in the system with respect to the algal browsers whose breeding and enhancement technologies are standardized. This immense gap between the actual yield and estimated potential calls for immediate interventions such as species enhancement programmes, specifically culture based fisheries. Similarly in Pothundi reservoir, the estimated production potential of planktivores to the tune of 127.8 kg/ha against the actual yield of 20.45 kg/ha points out to a need for better management of the reservoir in terms of fisheries. Indian Major Carps, which represent 69% of the total actual yield of planktivores (20.45 Kg/ha) ascertained it as a great contributor to the production from the system.



Functional feeding group-wise production potential of Peechi and Pothundi reservoirs

Rani Palaniswamy, Thankam Theresa Paul, S. Manoharan, Usha Unnithan and U.K. Sarkar

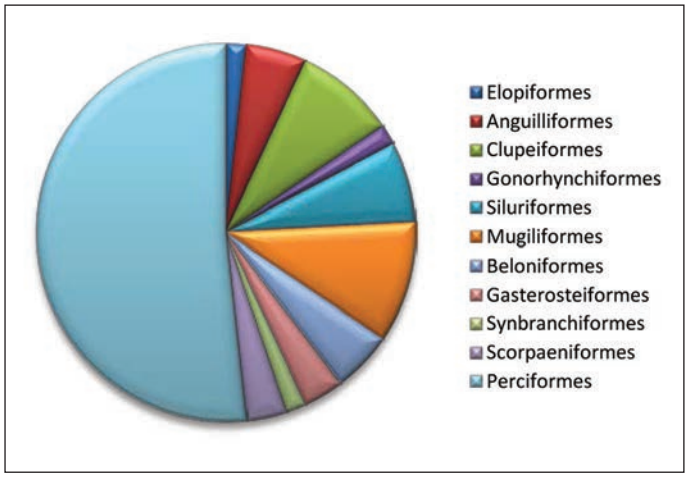
Spatial variability of primary production in Bhavanisagar reservoir, Tamil Nadu

Energy fixation by primary producers is a measure to estimate the production potential of reservoir which will help the effective management of its resources. Primary production is controlled by turbidity, nutrient availability and flushing rate and their impact is highly prominent in large reservoir. To study the spatial variability in primary production, 3 zones viz lotic, intermediate and lentic were selected in Bhavanisagar reservoir (7500 ha), Tamil Nadu during 2016-17. The average gross primary production was high (210.9 mgC/m^3/hr) in intermediate zone followed by lentic zone (138.9 mgC/m^3/hr). Drastically low value of gross primary production (26.5 mgC/m^3/hr) was estimated in lotic zone possibly due to high flushing rate of water. The energy fixed by the primary production in Bhavanisagar reservoir accounts to 6830 cal/m^2/day which exhibits a photosynthetic efficiency of 0.32%. Based on the photosynthetic efficiency, average fish yield at 1.2% of energy conversion was estimated to 467.4 kg/ha/year.

Rani Palaniswamy, Thankam Theresa Paul, S. Manoharan and Usha Unnithan

Crustacean fishery- A productive and potential livelihood options for fishermen in Korapuzha Estuary, Kerala

The study shows that the major fish catch of the Korapuzha estuary is from the gears like stake net, cast net, gill net (for crab fishing) and hook and line. Oyster and clam collection are also important fishery in this region. A total of 59 fish species belonging to 27 families and 11 orders were recorded in the present study from this estuary. Order Perciformes contributes highest number of family (12 family) as well as species (30 species). Compared to finfish, Shellfish catch is economically important fishery in this locality. Major shellfishes are *Acetus indicus*, *Penaeus monodon*, *Fenneropenaeus indicus*, *Metapenaeus dobsoni*, *M. Monoceros*, *Scylla serrata*, *S. tranquebarica*, *Portunus sanguinolentus*, *Portunus pelagicus*, *Meretrix* sp. and *Crassostrea madrasensis*. In Korapuzha estuary crustacean fishery dominates over teleost fishery which was 78% to 87% during 2015-2016. Most of the *Acetus indicus* catch is used in dry fish industry (dry *A. indicus* ₹300-800/kg). The value added products of *A. indicus* have high demand in local and international market. Crab also fetches high price with a range of ₹300-700/kg.



Order-wise distribution of fishes

V. L. Ramya and S. K. Das

Innovative technology of *In-situ* raising of stunted carp fingerings in pen enclosures for stock enhancement in seasonally open *beel*

Pen aquaculture experiments were undertaken in a moderate-sized (20 ha), seasonally open floodplain wetland of Assam (Mer *beel*, Nagaon district) to produce stunted carp fingerlings. Four big-size (2500 m^2 each) rectangular pens were constructed using net-lined split-bamboo screens and installed in marginal areas of the beel during August, 2015. Stocked fishes were initially fed with supplementary feed @ 3% of body weight, which was gradually reduced to 0.5% for adapting them for releasing to the *beel*. After 5 months of rearing, the highest specific growth rate was observed in mrigal (1.45) followed by gonius (1.14), grass carp (1.11), rohu (0.86), catla (0.86), whereas silver carp recorded the lowest SGR (0.70). The average weight of the

Pen culture in Mer *beel*

stunted fingerlings was 150.9g with 86% survival. Stunted carp fingerlings raised in the pens were released to the beel proper for stock enhancement @ 2000 nos./ha towards partial restocking of the beel following the first major part-harvest in the beel during January. The benefit-cost ratio was 1.92, showing that in-situ raising of stunted fingerlings of carps in pen enclosure is economically viable.

Pronob Das, B. K. Bhattacharjya, D. Debnath, A. K. Yadav, S. Yengkokpam, K. K. Sarma, A. Kakati and B. K. Das

First record of *Bangana dero* (Hamilton, 1822) from Deepor *beel* of Assam

Deepor *beel* (Latitude: 26°05′26″N to 26°09′26″N; Longitude: 90°36′E to 90°41′25″E) located in Kamrup district, Assam, is a large (water spread area of 589 ha) natural wetland and a Ramsar site of international importance. The wetland has enormous biological and environmental importance which supports a number of endemic endangered and threatened animals and plants that are included under IUCN red-list. Past studies by ICAR-CIFRI Regional Centre, Guwahati indicated occurrence of 67 fin-fish species in the beel. 28 specimens of *Bangana dero*, a cyprinid fish from the beel were collected during October, 2016 for the first time. Total length of the reported specimens ranged from 8.77–10.14 cm and weight ranged from 6.74–10.61 g. The length-weight relationship of the species was worked out as $W=0.074*L^{2.103}$. *B. dero* reportedly inhabits upland rivers,

Bangana dero (Hamilton, 1822)

torrential hill-streams; adults migrate to warm downstream regions during the winter season (December-February). Thus, occurrence of this species in Deepor beel indicates its possible downstream migration from one or both the feeder rivers (Basistha and Kalamoni).

Simanku Borah, B. K. Bhattacharjya, B. J. Saud, A. K. Yadav, Pronob Das, Sona Yengkokpam, Dipesh Debnath, Niti Sharma and Amulya Kakati

Fecundity and gonado-somatic index of *Puntius sophore* and *Mystus carcio* from floodplain wetlands of Assam

Gonadal maturity, spawning period, fecundity and related reproductive parameters were assessed in two numerically dominant small indigenous fish species, *Puntius sophore* and *Mystus carcio* from selected floodplain wetlands of Assam. A total of 523 specimens of *P. sophore* (total length: 4.2-9.2 cm, weight: 2.48-10.68 g) and 542 specimens of *M. carcio* (5.9-10.1 cm, 2.02-9.64 g) were collected from Nagaon and Lakhimpur districts of Assam during April 2015 to March 2016. The Gonado-somatic index (GSI) of *P. sophore* was in the range of 0.001-8.54 and 0.02-19.64 for males and females, respectively, during the study period. The GSI of female *P. sophore* increased from 15.41 (June) to reach the peak value of 19.64 during August; thereafter it decreased sharply to 10.82 in September indicating peak spawning of the species during September. Similarly the GSI values of male *P. sophore* were the highest in August (8.54), which sharply decreased to 3.87 in September. The GSI value of *M. carcio* was in the range of 0.001-9.54 and 0.01-30.32 for males and females respectively. GSI values of female *M. carcio* showed an increasing trend from June (26.52), reaching the peak during August-September (30.12-30.32). GSI values decreased to 12.1 in October indicating

Puntius sophore

Mystus carcio

peak spawning of the species during this month. This was corroborated by the trend in GSI values of male *M. carcio* (increased from 2.48 in April to 9.54 in August and sharply decreasing to 2.21 during October. The absolute fecundity of *P. sophore* varied from 434 (corresponding to total length of 4.8 cm and weight of 5.28 g) to 11854 (8.2 cm, 9.28 g). In *M. carcio* absolute fecundity ranged from 3,451 (5.4 cm, 7.6 g) to 19,854 (7.8 cm, 9.3 g).

B. K. Bhattacharjya, D. Debnath, A. K. Yadav and B. J. Saud

Investigated mass fish mortality in the water bodies of Paradip, Odisha

Based on the report of large scale fish death, mostly in juveniles of Catla (Catla catla), Rohu (Labeo rohita) and Mrigal (Cirrhinus mrigala), in the water bodies of Paradip in Jagatsinghpur district of Odisha, a team of scientists from the Institute comprising of Drs. S. K. Nag, A. K. Sahoo and Deepa Sudheesan visited the site on August 10, 2016 at Bata river, an associated water body of Mahanadi river in Paradip having an area of around 25 acre.

Analysis of water samples revealed extremely low (1 ppm) level of DO, high TDS and alkalinity. DO level at 1 ppm has sublethal effect on fish growth and feed utilization while less than 1 ppm level is lethal to fish. Analysis of water and fish tissues for heavy metals revealed presence of Pb at 75 ppb level in water which is slightly higher than the critical maximum concentration of the element for aquatic life as prescribed by USEPA. Lead was also found to be accumulated in flesh and gill of fish samples at concentration higher than recommended level of 5 ppm (for canned fish) by FSSAI, Govt. of India. Pesticide contamination was not recorded in water but found in fish tissues, however, at concentrations safe for human consumption. The investigation concluded that low dissolved

Discharge of domestic sewage

oxygen due to polluted environment caused by discharge of untreated domestic sewage, industrial sewage, dumping of waste, poor maintenance resulted in unfavourable condition and fish mortality.

S. K. Nag, A. K. Sahoo, Deepa Sudheesan and B. K. Das

Fatty acid profile including DHA and EPA contents of Indian food fishes

The fatty acids DHA (Docosahexanoic acid) and EPA (Eicosapentanoic acid) play important role in preventing a number of diseases like atherosclerosis, dementia, rheumatoid arthritis, Alzheimer's disease, etc. As essential fatty acids, these are obtained through diet and therefore searching for affordable sources of these ω-3 polyunsaturated fatty acids (PUFA) is important. Fish is an important source of PUFA and has unique advantage. There are many food fish species available and consumers have a wide choice owing to availability and affordability. DHA and EPA content and fatty acid profile of 39 important food fishes from India have been generated. The study showed that *Tenualosa ilisha*, *Sardinella longiceps*, *Nemipterus japonicus*, and *Anabas testudineus* are the important species which are rich sources of DHA and EPA.

Hindawi

Research Article

DHA and EPA Content and Fatty Acid Profile of 39 Food Fishes from India

B. P. Mohanty, D. Karunakaran, S. Ganguly, A. Mahanty and T. Mitra

Micronutrient profile of important Indian food fishes

Fish is an important source of micronutrients (both vitamins and minerals). Hence, fishes can be useful in eradicating the micronutrient deficiency prevalent in developing countries. The micronutrient composition of important food fishes from India has been generated from varying aquatic habitats. The marine fishes were found to be rich in sodium and potassium; small indigenous fishes (SIFs) in calcium, iron, and manganese; coldwater fishes in selenium; and the brackishwater fishes in phosphorous. The marine fishes *Sardinella longiceps* and *Epinephelus* spp. and the SIFs were rich in all fat-soluble vitamins. Information on the micronutrient composition of these fishes are available at www.cifri.res.in/nutrifishin/index.php (NUTRIFISHIN).

B. P. Mohanty, S. Ganguly, A. Mahanty, T. Mitra and D. Karunakaran

Role of fisheries in livelihood support of the fishers in Hooghly-Bhagirathi stretch of River Ganga

The Hooghly-Bhagirathi stretch of the river Ganga is dotted with hundreds of thousands of fishermen households in both the banks. Thousands of fishers and other riparian population are depended directly or indirectly on the goods and services of this river for livelihoods. It was reported that an estimated 20,390 number of fishermen were involved in hilsa fishery alone in lower stretch below Dakshineswar, whereas about 5600 number of hilsa fishermen are there in the stretch of Dakshineswar to Farakka.

The study, covering 500 fisher families from Sagar to Farakka stretch, indicated that the fishing is the primary occupation to around 89% of the responded fishers; the percentage is higher in lower stretch (92%), Sagar to Baranagar. Fishing activities contribute major share (70%) in their total income and it is the only source of income to a sizeable number of households. The number of non-fishing activities are more in the upper zone as the fishery alone is not sufficient to provide full livelihood in the stretch. Average number of income generating activities in the households ranged from 1.43 in lower stretch to 1.79 in upper stretch (Dampal Char to Farakka). A small amount of income comes from agriculture, labour wage, service, petty business, etc. In the season of less catch, the youth generally are engaged as labours or rickshaw van pullers to earn their livelihood.

Fishermen at Sultanpur, S. 24 Parganas, W.B.

Fisher women selling fishes at Godakhali, S. 24 Parganas, W.B.

Arun Pandit, A. Ekka, R. K. Raman, S. Samanta, B. K. Das and L. Chakraborty

Feeding trial incorporating small indigenous fishes in the diet of women in Sundarbans region

The institute conducted one month feeding trial incorporating Small Indigenous Fishes (SIFs) in the regular diet of thirty women at Madanganj village of Namkhana Block, Sunderbans in collaboration with the Madanganj Fishermen Cooperative society and ICDS centre. Before the trial, a health camp was conducted on 12th February, 2017 to clinically assess the

nutritional gap of the women. The blood sample analysis indicated that 20% women were anaemic and more than 40% women were deficient in blood calcium. After the feeding trial, analysis of blood samples shows an increasing trend in blood Calcium and blood Phosphorus due to inclusion of SIFs in their daily diet. The institute also established a conservation site for SIFs in Madanganj Village and five demonstration ponds for showcasing the benefits of culturing SIFs with other species. To generate awareness among the villagers and the people of Namkhana Block regarding the nutritional value of available SIFs, pamphlets were distributed among the villagers and posters were distributed to the community leaders, BDO, BMOH, Dwariknagar Gramin Hospital of Namkana Block. The feeding trial programme was co-ordinated by Dr. Aparna Roy, Dr. Md. Aftabuddin and Dr. P. Parida under the guidance of Dr. B. K. Das, Director, ICAR-CIFRI.

Feeding trial

Aparna Roy, Md. Aftabuddin, P. K. Parida, B. K. Das, A. Sinha, Abhisek Ghosh and Supriti Bayen

Research Activities under NEH

Supplementary stocking of Indian Major Carps for fish stock enhancement in Sorbhog *beel*, Assam

ICAR-CIFRI Regional Centre, Guwahati in collaboration with AFDC Ltd., Guwahati carried out supplementary stocking based on Indian major carps in Sorbhog beel (closed, water-spread area 34 ha), Barpeta district of Assam. Fingerlings of *Catla catla*, *Labeo rohita* and *Cirrhinus mrigala* were stocked @ 3,000 nos./ha on October 10, 2015. Sampling of stocked fishes to assess their growth and monitoring of water quality after 15 months of stocking was carried out on January 24, 2017. The initial and final length/ weight of reared fishes were as follows: catla (15.52 cm/ 43.34 g and 32.33 cm/ 485.67 g), rohu (13.68 cm/ 26.21 g and 28.54 cm/ 272.9 g) and mrigal (15.80 cm/ 34.77 g and 27.04 cm/ 170.23 g). Catla attained the highest growth with specific growth rate (SGR) of 1.34, followed by rohu (SGR 1.3) and mrigal (SGR 0.99).

Harvested fishes

B.K. Bhattacharjya, D. Debnath, P. Das, S. Borah, S. Yengkokpam, A.K. Yadav, N. Sharma, N.S. Singh, K.K. Sarma and A. Kakati

Trainings Conducted

Fishers/Fish farmers Training

Sl. No.	Name of the training	Date	Venue	Participants
1	Livelihood improvement of tribal fish farmers through inland fisheries management	Sept 30-Oct 04, 2016	CIFRI, H.Q. Barackpore	27 fishers/fish farmers including 9 fisherwomen of Santhal community

Fishers/Fish farmers Training

Sl. No.	Name of the training	Date	Venue	Participants
2	Development of freshwater ornamental fisheries sector of Northeast India organized by NFDB Regional Centre, Guwahati in collaboration with ICAR-CIFRI RC, Guwahati	Oct 04-06, 2016	CIFRI, Guwahati RRC	56 fish farmers/fishers
3	Inland open water fisheries management and development	Oct 13-19, 2016	CIFRI, H.Q. Barackpore	26 fishers/fish farmers from Madhepura, Bihar
4	Tribal farmers training under TSP	Oct 22, 2016	Paharpur, Murshidabad (On-field)	TSP Paharpur, Murshidabad (150 farmers)
5	Inland open water fisheries management and development	Nov 09-15, 2016	CIFRI, H.Q. Barackpore	30 fishers/fish farmers from Katihar, Bihar
6	Inland fisheries management	Nov 15-17, 2016	CIFRI, H.Q. Barackpore	13 fishers/fish farmers from Tripura and Assam under funding of Tata Trusts
7	Inland open water fisheries management and development	Nov 17-23, 2016	CIFRI, H.Q. Barackpore	26 fishers/fish farmers from Araria, Bihar
8	Inland open water fisheries management and development	Dec 03-09, 2016	CIFRI, H.Q. Barackpore	25 fishers/fish farmers from Kishangunj, Bihar
9	Upgradation of knowledge on Fisheries and Aquaculture organized by RKM Sargachi, Murshidabad	Dec 08-09, 2016	CIFRI, H.Q. Barackpore	Fishers of Sargachi, Murshidabad
10	Inland open water fisheries management and development	Dec 16-22, 2016	CIFRI, H.Q. Barackpore	26 fishers/fish farmers from Bhagalpur, Bihar
11	Fish feed formulation, preparation and its importance in Northeast India organized by NFDB Regional Centre, Guwahati in collaboration with ICAR-CIFA, Bhubaneswar and ICAR-CIFRI RC, Guwahati	Dec 22-23, 2016	CIFRI, Guwahati RRC	55 fish farmers/fishers of Assam
12	Inland Fisheries Management	Dec 23-26, 2016	CIFRI, H.Q. Barackpore	31 fishers/fish farmers from Mayurbhanj, Odisha
13	Inland open water fisheries management and development	Jan 03-09, 2017	CIFRI, H.Q. Barackpore	29 fishers/fish farmers from Begusarai, Bihar
14	Inland open water fisheries management and development	Jan 25-31, 2017	CIFRI, H.Q. Barackpore	24 fishers/fish farmers from Sheikhpura, Bihar
15	On-field farmers training on the occasion of Fishers Family Farming School	Feb 06-07, 2017 & March 04-05, 2017	Haldia & Sutahata Block of Purba Medinipur	Fishers of Haldia & Sutahata Block of Purba Medinipur

Training programme for Araria district fishers/fish farmers

Distribution of certificate to Seikhpura district fishers/fish farmers

Students Training

Sl. No.	Name of the training	Date	Venue	Participants
1.	Inland Fisheries Management	Nov 24-Dec 01, 2016	CIFRI, H.Q. Barackpore	24 B.Sc. (IFF) students from APC College, New Barrackpore and 4 students from M.L.S.M. College, Darbhanga.
2.	Inland Fisheries Management	March 15-22, 2017	CIFRI, H.Q. Barackpore	30 P.G. Students from Vinoba Bhave University, Hazaribagh
3.	Inland Fisheries Management	March 23-April 01, 2017	CIFRI, H.Q. Barackpore	25 P.G. Students from P. K. Roy Memorial College, Dhanbad
4.	Inland Fisheries Management	March 28-April 31, 2017	CIFRI, H.Q. Barackpore	44 P.G. Students from Utkal University, Bhubaneswar, Odisha

Distribution of certificate to Vinoba Bhave College students

ICAR-CIFRI staff with ICAR-CIFE students

Officials Training

Sl. No.	Name of the training	Date	Venue	Participants
1.	Inland Fisheries Management	Nov 22-26, 2016	CIFRI, H.Q. Barackpore	16 Officials from DoF, Madhya Pradesh, Chattarpur

Exhibitions Participated

Sl. No.	Date	Exhibition	Place
1.	Oct 16, 2016	World food day function, organised by Orissa Krushak Samaj, Bhubaneswar	Institute of Engineers Sachivalaya Marg, Bhubaneswar
2.	Nov 28-30, 2016	RAF (Krishi Kumbhu-2016) Participated by Allahabad RRC	Muzaffarnagar, U.P.
3.	Nov 28-29, 2017	Pig Expo, Participated by Guwahati RRC	ICAR-NRCP, Rani, Guwahati
4.	Dec 01-03, 2016	National Seminar on 'Aquaculture Diversification: the way forward for Blue Revolution'	ICAR-CIFA, Bhubaneswar
5.	Dec 16-19, 2016	*Alukarbarh Seba Sangha*	Purba Medinipur, W.B.
6.	Dec 20-29, 2016	*Sundarban-Krishti Mela-O-Loko Sanskriti Utsab*, organised by Kultali Milan Tirtha Society	Kultali, 24 PGS (S), W.B.
7.	Dec 22-31, 2016	*Sunderban Yuba Mela* - 2016, Organised by Bahurpee Sangha, Taldi	Taldi Mohan Chand High School Compound, 24 PGS (S), W.B.
8.	Dec 24-31, 2016	Naihati Utsav- 2016	Bijoynagar, Naihati, W.B.
9.	Jan 06-12, 2017	21st Agriculture-Industry-Tourism & Science Festival, organised by *Contai Pallpara Saradadevi Mahila Mondal*	Baruipur Science Fair Campus, Purba Medinipur, W.B.
10.	Jan 08-15, 2017	Srijani Sangha, Manmohan Mela	Chotojagulia, 24 PGS (N), W.B.
11.	Jan 23-30, 2017	10th *Sundarban Lokoprio Utsav*-2017	Basanti, 24 PGS (S), W.B.
12.	Feb 03-05, 2017	2nd National Students Convention on Innovative Approaches for Academic Excellence in Higher Fisheries Education	ICAR-CIFE, Mumbai
13.	Feb 06-09, 2017	4th Assam International Agri-Horticultural Show	Khanapara, Guwahati
14.	Feb 13, 2017	Foundation Stone Laying Ceremony of KVK, Nilgunj	ICAR-CRIJAF, Barrackpore
15.	March 11-12, 2017	National Seminar PFA-2017, organized by ICAR-CIFRI, IFSI, Barrackpore & CoF, OUAT, OFCAAR Rangeilunda, Odisha	CoF, OUAT, Rangeilunda, Odisha
16.	March 25-27, 2017	Science & Technology Fair & Exhibition	Salt Lake, Sector-V, Kolkata

Shri S.S. Ahluwalia, Hon'ble MoS for Agriculture and farmers welfare, Govt. of India visiting ICAR-CIFRI stall

Exposure / Educational Visits

Sl. No.	Visitors	Date of Visit
1.	2 Scientists from ICAR-CIFE, Mumbai	Oct 14, 2016
2.	24 M.Sc. (3rd semester) students and 2 Professor-In charges from Department of Zoology, North Bengal University, Darjeeling	Oct 31, 2016
3.	7 Officials from DoF, Himachal Pradesh	Nov 19, 2016
4.	31 B.F.Sc. students from College of Fisheries, Ratnagiri, Maharashtra	Dec 01, 2016
5.	134 B.Sc. students (1st, 2nd, 3rd year) and 4 Professor In charges from Dum Dum Motijheel College, Dum Dum, Kolkata	Dec 14, 2016
6.	30 B.F.Sc. students and 2 Professor-In charges from College of Fisheries, Mangaluru, Karnataka	Dec 15, 2016
7.	20 B.Sc. (3rd year) students and one Professor-In charge from Anandamohan College, Raja Ram Mohan Sarani, Kolkata	Dec 16, 2016
8.	19 B.F.Sc. students and 2 Professor-In Charges from College of Fisheries, GADVASU, Ludhiana	Jan 02, 2017
9.	Block level exposure visit programme for the Farming community under ATMA Programme (Progressive farmers, KPS, Staff, FEO from Barasat, Nilgunj, Babpur, W.B.) Total visitors 69	Jan 05, 2017
10.	9 B.Sc. students & 1 Professor-In Charge from Maharaja Manindra Chandra College, Kolkata	Jan 16, 2017
11.	25 B.F.Sc. (3rd Year) students and 2 Professor-In Charge from college of Fisheries, Kawardha, Chhattisgarh	Jan 23, 2017
12.	14 B.Sc. (3rd Year) students and 2 Professor-In Charges from Srikishan Sarda College, Hailakandi, Assam	Jan 24, 2017
13.	9 Progressive Fish Farmers & 1 AFDO from A & N Island, Port Blair	Feb 06, 2017
14.	20 fish farmers from Imphal East district, Manipur	Feb 13-16, 2017
15.	20 Fish Farmers from & NGO members from Nagaon Assam	Feb 14-16, 2017
16.	9 P.G. students, Dept. of Zoology (Fishery & Fishery Science) and one Assistant Professor In charge from Darrang College, Tezpur (Assam)	March 29, 2017

Awards and Recognitions

- The institute was conferred with Cashless ICAR institute award. Dr. B.K. Das, Director CIFRI received the award from Shri Radha Mohan Singh, Honb'le Minister of Agriculture & Farmers Welfare, Govt of India, at New Delhi.
- Dr. U.K. Sarkar was recognized as Member, Institute Management Committee of ICAR-NBFGR by ICAR. He was also recognized as Advisory committee member of UGC of the UGC SAP research programme, Department of Zoology, Guru Nanak Dev University, Amritsar by the UGC, New Delhi. Moreover he served as External Expert and reviewer of DSIR funded research project at BCKVV, Kalyani.
- Dr. B.K. Bhattacharjya is continued to be a Member, Board of Directors, AFDC Ltd., Guwahati by Department of Fisheries, Govt. of Assam, Guwahati. He has also served as expert for Phone-in-live programme on 'Fisheries management of beels' for Doordarshan Kendra, Guwahati.
- Dr. Pronob Das served as expert on Aquaculture and Fish health for Doordarshan Kendra, Guwahati in Krishi Darshan Programme.
- The paper 'Soil organic carbon accumulation in Chilika lake, India' authored by R.K. Manna, A. Raut, S.K. Banik, S. Mandal, M. Mukherjee, S.K. Karna, V. R. Suresh and B.K. Das received the Best oral presentation award at the National Seminar on '*National Priorities In Fisheries and Aquaculture*'organised By College of Fisheries, OUAT, OFCAAR, IFSI and CIFRI held at Rangeilunda, Odisha during 11 to 12th March, 2017.
- Another the paper '*Tuka or Feka* fishery- an indigenous fishing practices to catch IMC in Ganga river' at Ballia, Uttar Pradesh authored by P. Samanta, R.K. Manna, T.S. Bhowmik, A. Ray, A. Singh, Manas H.M., M.H. Ramteke, S. Mondal, S.K. Behera, B.K. Das received the Best poster presentation award at the same National Seminar.
- Ms. Sibina S. Mol was adjudged the Best Woman Athlete in the ICAR Eastern Zonal Sports held at ICAR-NRRI, Cuttack during 6-9 March 2017. She won four Gold, one Silver and one Bronze medals. The institute has also won Gold medals in Table Tennis (TT), both in individual and team events. The TT team comprised of Sh. Sukumar Sarkar, Sh. Somnth Banerjee, Sh. Debasish Singha, Sh. P.R. Mahata and Sh. Swapan Das. Sh. M. Roy also won the Silver medal in javelin throw.

The Director receiving Cashless ICAR institute Award

Cashless ICAR Institute Award Certificate

ICAR-CIFRI sports contingent

Ms. Sibina S. Mol , the Best Woman Athlete in the TEZ 201

Superannuations

Name & Designation	Last Place of Posting	Date of Superannuation
Dr. D. S. K. Rao, Principal Scientist	Bangalore RRC	October 31, 2016
Shri K. Mohanan, SSS	Bangalore RRC	October 30, 2016 (VRS)
Shri G. J. Raundale, SSS	Vadodara RRC	December 31, 2016
Smt. S. Chakraborty, SSS	Barrackpore Hqs.	December 31, 2016
Shri A. C. Biswas, Assistant	Allahabad RRC	January 31, 2017
Shri B. K. Halder, SSS	Barrackpore Hqs.	January 31, 2017
Shri S. C. Sadhukhan, SSS	Barrackpore Hqs.	January 31, 2017
Shri M. P. Das, SSS	Barrackpore Hqs.	March 31, 2017

Promotions

Name & Designation	Promoted to	With effect from
Mrs. T.T. Paul, Scientist	Probation Clearance	December 15, 2011
Dr. Sandhya K.M., Scientist	Probation Clearance	January 23, 2014
Ms. Anjana Ekka, Scientist	Scientist with RGP ₹7000/-	June 23, 2014
Dr. Soma Das Sarkar, Scientist	Scientist with RGP ₹7000/-	September 01, 2014
Dr. Sajina A. M., Scientist	Scientist with RGP ₹7000/-	September 01, 2014
Dr. Deepa Sudheesan, Scientist	Scientist with RGP ₹7000/-	September 01, 2014
Shri D.K. Meena, Scientist	Scientist with RGP ₹7000/-	December 15, 2014
Shri Dibakar Bhakta, Scientist	Probation Clearance	January 01, 2015
Dr. B. K. Biswas, ACTO	Chief Technical Officer	January 01, 2015
Shri C. N. Mukherjee, ACTO	Chief Technical Officer	February 03, 2015
Dr. Rohan Kumar Raman, Scientist	Probation Clearance	July 01, 2015
Mrs. Suman Kumari, Scientist	Probation Clearance	July 01, 2015
Shri Ashis Roy Chowdhury, STA	Technical Officer	August 27, 2015
Shri Samir Kumar Paul, Tech Officer	Sr. Tech Officer	October 16, 2015
Dr. Lianthuamluiaia, Scientist	Probation Clearance	January 01, 2016
Dr. Manas H.M., Scientist	Probation Clearance	January 01, 2016
Shri Mishal P., Scientist	Probation Clearance	January 01, 2016
Shri Raju Baitha, Scientist	Probation Clearance	January 01, 2016
Dr. Kavita Kumari, Scientist	Probation Clearance	January 01, 2016
Ms. Gunjan Karnatak, Scientist	Probation Clearance	January 01, 2016
Shri D. K. Biswas, ACTO	Chief Technical Officer	January 01, 2016
Shri Rajesh Kumar Sah, STA	Sr. Technical Assistant	January 01, 2016
Mrs. Tanuja Abdulla, Scientist	Probation Clearance	January 03, 2016
Shri A. K. Mondal, STA	Technical Officer	June 29, 2016
Shri Ram Sajiwan, STA	Technical officer	June 29, 2016
Shri Ram Prasad, TA	Sr. Technical Assistant	June 29, 2016

Promotions

Name & Designation	Promoted to	With effect from
Shri Subhendu Mandal, TA	Sr. Technical Assistant	June 29, 2016
Shri Asim Kumar Jana, TA	Sr. Technical Assistant	June 29, 2016
Shri Yousuf Ali Sk., TA	Sr. Technical Assistant	June 29, 2016
Shri K.K. Sharma, ACTO	Chief Technical Officer	July 01, 2016
Shri Sujit Chowdhury, STO	Asstt. Chief Technical Officer	July 22, 2016
Smt. Abhijita Sengupta, STO	Asstt. Chief Technical Officer	August 27, 2016
Smt. Mousumi Bannerjee, UDC	2nd MACP with G.P. ₹2800/-	September 13, 2016
Shri Bipul Chandra Roy, Tech Officer	Sr. Tech Officer	September 14, 2016
Smt. Shyamali Mitra, Assistant	3rd MACP with G.P. ₹4600/-	December 02, 2016
Smt. Pausali Mukherjee, Assistant	Asstt. Admn. Officer	February 13, 2017
Shri Subir Das, Assistant	Asstt. Admn. Officer	February 13, 2017

Transfers

Name & Designation	From	To
Dr. K. D. Joshi, Principal Scientist	ICAR-CIFRI Allahabad RRC	ICAR-NBFGR, Lucknow
Shri Satya Narayan Sahoo, Scientist	ICAR-CIFRI, Barrackpore	ICAR-CIFA, Bhubaneswar
Mrs. Jesna P.K., Scientist	ICAR-CIFA, Bhubaneswar	ICAR-CIFRI, Bangalore RRC
Dr. Ajoy Saha, Scientist	ICAR-DMAPR, Ananad	ICAR-CIFRI, Bangalore RRC
Shri S. R. Meena	ICAR-CIFRI Allahabad RRC	ICAR-CIFRI, Barrackpore
Shri Rajeev Lal, CAO	ICAR-NIRJAFT, Kolkata	ICAR-CIFRI, Barrackpore

Meetings

On-field workshops on cage culture at Bhakra and Pong Dam, Himachal Pradesh

Two on-field workshops were organized by the institute on reservoir fisheries management with special emphasis on cage culture sponsored by Deptt. of Fisheries, Govt. of Himachal Pradesh at cage installation sites near village Proiana, Bhakra Dam on October 27, 2016 and Astt. Director of Fisheries (ADF) office, Pong Dam on October 28, 2016. A total of 140 fishers from the Fishers' Cooperative Societies near cage installation sites in two reservoirs participated in the programme. Various lectures on reservoir fisheries management, cage culture for producing stocking materials vis-a-vis table fish production with diversification of fish species including field practicals of water analysis were done. Training materials were distributed among the trainees. Wise-use of the gears with proper mesh size, strictly implementation of closing seasons, banning of small meshed gill nets and zero-meshed drag nets were discussed and interactive session was also organized. The officials of DoF, H.P. including ADF and FEO, Pong Dam and Supdt. Inspector, Bhakra Dam participated in the workshop.

Workshop at Bhakra dam

Fish health awareness camp at East Kolkata Wetlands

Water quality analysis

ICAR-CIFRI in collaboration with Department of Fisheries, Govt. of West Bengal organized a fish health awareness camp under National Aquatic Surveillance Programme on Aquatic Animal Diseases and *Mera Gaon Mera Gaurav* programme at Bantala village in East Kolkata Wetland area on November 5, 2016. This Awareness camp was organized with the objective of sensitizing the people of East Kolkata wetland areas about fish health management and contribution of fishiries in sustainable livelihoods and nutritional security for them. Dr. B.K. Das, Director, Dr. V.V. Sadamate, former advisor of the Planning Commission, Dr. Priyanshi, Environmentalist, Institute of International Water Management, Dr. Tapas Paria, ADF were among the dignitaries attended the programme. On spot fish disease diagnosis and water quality analysis was done by team CIFRI, based on which recommendations were given to the farmers.

Consultation on Roadmaps for open water fisheries development in Eastern India

A consultation meeting was organized on Dec 7, 2016 for discussion on fisheries road map developed by the institute for bringing Blue Revolution in Eastern states of Bihar, Jharkhand, Odisha and West Bengal. The meeting was conducted under the chairmanship and guidance of Dr. B.K. Das, Director, ICAR-CIFRI. The meeting was attended by Dr. Dilip Kumar, former Director ICAR-CIFE, Mumbai; Dr. B.C. Jha, Former HoD, ICAR-CIFRI; Dr. Nishat Ahmad, Director, Department of Fisheries, Govt. of Bihar; Shri S. Biswas, Joint Director, Department of Fisheries, Govt. of West Bengal; Shri Debananda Bhanja, Joint Director, Department of Fisheries, Govt. of Odisha; Shri Prashant Kumar, DFO, Department of Fisheries, Govt.of Jharkhand; Prof. P.N. Pandey, President, Zoological Society of India; Prof. B.N. Pandey,

Presentation of Fisheries roadmaps by the Director

Working-President, Zoological Society of India; Prof. P.K. Sur, Professor, University of Kalyani and ICAR-CIFRI scientists. The Road Maps prepared by ICAR-CIFRI were presented and discussed with the state fisheries officials and the suggestions were incorporated in the document.

राजभाषा हिन्दी में टिप्पण तथा प्रारूप लेखन पर कार्यशाला

भाकृअनुप–केन्द्रीय अंतर्स्थलीय मात्स्यिकी अनुसंधान संस्थान, बैरकपुर मुख्यालय में दिनांक 22 दिसम्बर 2016 को हिन्दी में टिप्पण तथा प्रारूप लेखन पर एक कार्यशाला आयोजित की गई। उक्त कार्याशाला में संस्थान के 15 अधिकारियों एवं कर्मचारियों में भाग लिया। इस कार्यशाला में हिन्दी शिक्षण योजना, राजभाषा विभाग, कोलकाता के प्रतिनिधि, श्री अदालत प्रसाद, वरिष्ठ हिन्दी प्राध्यापक को व्याख्यान के लिये आमंत्रित किया गया था। श्री अदालत प्रसाद ने निदेशक महोदय का धन्यवाद करते हुये राजभाषा हिन्दी संबंधी कार्यालय आदेशों, कार्यालय ज्ञापन और टिप्पण एवं प्रारूप लेखन पर चर्चा की तथा प्रतिभागियों के प्रश्नों का सरल भाषा में समाधान बताया। उन्होंने प्रतिभागियों को अभ्यास कार्य द्वारा टिप्पणी एवं प्रारूप लेखन संबंधी कठिनाइयों के समाधान को सोदाहरण बताया। उन्होंने यह आशा व्यक्त की कि इस अभ्यास

से भावी हिन्दी कार्यों में होने वाली त्रुटियों में कमी होगी। संस्थान के निदेशक महोदय के मार्गदर्शन में आयोजित इस कार्यशाला में हिन्दी के प्रचार–प्रसार हेतु निम्नलिखित बिन्दुओं पर प्रकाश डाला गया –कार्यालय को प्राप्त होने और भेजी जाने वाली डाक को हिन्दी में दर्ज होना चाहिये, कार्यालय फाइलों में 30 प्रतिशत से अधिक टिप्पणियों को हिन्दी में लिखा जाना चाहिये, मिसिल के शीर्षक द्विभाषी अर्थात् हिन्दी एवं अंग्रेजी दोनों भाषाओं में होना चाहिये, हिन्दी में प्रवीणता प्राप्त अधिकारियों एवं कर्मचारियों को शत–प्रतिशत कार्य राजभाषा हिन्दी में करना चाहिये एवं हिन्दी में किये कार्यों का सामयिक (अपडेटेड) रिकार्ड कार्यालय में उपलब्ध होना चाहिये जिससे समय–समय पर होने वाली निरीक्षण समिति बैठक में प्रस्तुत करने में आसानी हो।

Mid-term IRC Meeting

The mid-term Institute Research Committee meeting was held at the Institute Headquarters, Barrackpore during October 3-4, 2016. Dr. B.K. Das, Director, ICAR-CIFRI chaired the meeting. Scientists from the CIFRI Headquarters including Kolkata Centre and all the Principal Investigators (PI) of the institute projects from RRCs attended the meeting. The house acknowledged the significant contributions of Dr. D.S. Krishna Rao, Principal Scientist, Bengaluru RRC who retired from the council's service on Oct 31, 2016. The Chairman urged all the Scientists to fulfill the targets assigned to them within the stipulated time as most of the projects will be ending by March 2017. Further, he stressed on the deliverables of the projects as per the RAC recommendation. Following the remarks of the Chairman, the PIs presented the achievements of their respective projects.

Kishan Gosthi-cum-Mass Awareness Camp at Murshidabad, West Bengal

The ICAR-CIFRI, in association with the Dept of Fisheries, Govt. of West Bengal organized a mass awareness camp-cum-Kisan Gosthi on January 20, 2017 at the premises of *Beel Bishnupur Agragami Matsyajibi Samabay Samiti*,

Berhampore block, district Murshidabad,West Bengal. The objectives of this gosthi was to sensitize the fishermen about the potential, scope and benefits of scientific beel fisheries management including strategies of stocking enhancement, enclosure culture and to create awareness about climate change and its impact on fishery and feeding strategies in inland fisheries. More than fifty fishermen and women of the Bishnupur and neighbouring beels participated in the programme. Dr. U.K. Sarkar, Head, RWF division chaired the event in which Dr. M.A. Hassan, Dr. Aftabuddin; Dr. Arun Pandit; Sh. D.K. Meena, Ms. Pritijyoti Majhi, and Mr. Bablu Naskar from ICAR-CIFRI discussed various issues. Shri Jayanta Pradhan, ADF; Shri Biswajit Biswas and Shri Ramkanai, DFO's from Department of Fisheries, Govt. of West Bengal; Shri Samir Biswas, President, Shri Alamat Hossain, Secretary, Shri Biswanath Mallick, Manager from the PFCS were also present on the occasion.

RAC meeting

The Meeting of the Research Advisory Committee (RAC) of the Institute was held at Barrackpore during March 17-18, 2017. Prof. Dr. B. Madhusoodana Kurup, Former Vice-Chancellor, Kerala University of Fisheries and Ocean Studies, Kochi,

presided over the meeting. The meeting was attended by the members of the Committee namely Dr. N. N. Rai, Dr. H. C. Joshi, Dr. G. N. Chattopadhyay, Dr. Sudhir Raizada, Dr. B. K. Das, Director and Dr. S. K. Nag, Member Secretary. Inter alia, the Chairman called upon the Scientists to focus on the research for knowledge based management of inland open waters and to formulate strategic action plans. The highlighted the necessity of sustainable development of inland open water fisheries. The RAC also felt the need for action oriented research and research for societal gain and livelihood improvement. The RAC expressed concerns over depleting fish biodiversity, lack of quality water resources, heavy metal and pesticide pollution, invasion of the exotic fish and climate change.

Kishan Gosthi-cum-Mass Awareness Camp at Sujapur Murshidabad, West Bengal

The institute in collaboration with Sargachi Ramakrishna Mission and State Fisheries Department, West Bengal conducted Kisan Gosthi cum- mass awareness camp on March 24, 2017 at Sujapur, Murshidabad to sensitize rural women for livelihood improvement through integrated wetland management. Bhagirathi-Damos beel (44ha) is a un exploited, largely weed chocked wetland with plenty of

indigenous fishery resources. The institute facilitated 1800 women of 155 Self Help Groups to take the wetland on lease to support their livelihood. The programme was graced by Maharaja Sri Viswamayanada of Sargachi Ramakrishna mission. Dr. B. K. Das, Director, CIFRI interacted with the women Self-help group members and informed them about the economic feasibility of beel fisheries. Dr. B. P. Mohanty, Dr. A. K. Das, Dr. B. K. Behera and Dr. Aparna also interacted with the rural women. A strategic plan was prepared for the integrated wetland management in collaboration with the Ramkrishna Mission, Women self-help groups and the State fisheries department.

Events

VIP Visits

Shri Sunil Kumar Singh, IAS, Additional Secretary & Financial Advisor, DARE/ICAR visited the Institute HQs Barrackpore on October 19, 2016. An interaction meeting with CIFRI Scientist and Officers was organized. Shri Singh, during the interaction, highlighted several features of the upcoming budget and clarified doubts of the Scientists. He also suggested several measures to ensure transparency during official purchase.

Visit of Additional Secretary DARE & Financial Advisor ICAR

Dr. K.K. Vijayan, Director, ICAR-Central Institute of Brackishwater Aquaculture, Chennai visited the Institute on October 21, 2016. An interaction meeting of Director, ICAR-CIBA with CIFRI Scientist was organized. Dr. Vijayan gave a motivational speech and appealed CIFRI Scientists to work hard and contribute to the blue revolution in India.

Visit of Dr. K.K. Vijayan

Hon'ble Minister of Fisheries, Govt. of Assam Shri Parimal Suklabadya along with Shri S. K. Das, ACS, Director of Fisheries, Govt. of Assam and his team of officials visited ICAR-CIFRI, Regional Centre, Guwahati on December 22, 2016. The delegates visited the facilities of the Centre including training and hostel facility for the farmers, laboratories, conference facility and library of the Centre.

Hon'ble Minister of Fisheries, Govt. of Assam, Sri Parimal Suklabaidya visiting the Centre

The Principal Secretary of Madhya Pradesh paid a visit to the institute on Jan 07, 2017. He interacted with the Director and Scientists and also visited different laboratories. He enquired about the CIFRI's intervention in the open waters in his state.

Principal Secretary, M.P. visiting the institute

Dr. T. Mohapatra, Secretary, DARE & DG, ICAR visited Regional Research Centre of ICAR-CIFRI and ICAR-CIFA, Bengaluru on January 15, 2017. The DG stressed that action plan mode activities should be done for developing fisheries of Karnataka, encompassing marine, inland, brackishwater, capture, culture and fish processing of fishes. He emphasised that the regional issues have to be addressed with greater vigour and scientific inputs. He spoke on the nutritional and food security value of SIFs and also stressed on the importance of ornamental fishes.

Dr. J. K. Jena, DDG (Fy. Sc) elaborated on the importance of the two centers in light of the rich biodiversity in the southern region, availability of many endemic fishes of food value, threatened status of the aquafauna and the conservation and propagation efforts being made at the centres. Dr. B. K. Das, Director, ICAR-CIFRI and Dr. J. K. Sundaray, Acting Director, ICAR-CIFA briefed the activities of their respective centres. A DVD on Cage Culture of fishes and five pamphlets on different topics were released on this occasion.

Release of publications by DG, DDG and other Dignitaries

Vigilance Awareness Week

The Vigilance Awareness Week-2016 (October 31-November 5, 2016) commenced at the Institute headquarters, Barrackpore with a pledge taking ceremony. The pledge was administered by Dr. B.K. Das, Director. The theme of this year's vigilance awareness week was "Public participation in promoting integrity and eradicating corruption". Celebration of the week was marked by several programmes like drawing cartoons, posters, banners; essay writing and debate competition; guest lecture etc. Another pledge was administered by the Director to all the staff of the institute to commemorate the Birth anniversary of Sardar Ballav Bhai Patel which is celebrated as National Integration Day.

Displaying drawings of the students

World Fisheries Day

The Institute celebrated world Fisheries Day at Nutri-smart Madanganj village developed by the institute in Namkhana block of Sundarban, West Bengal on November 21, 2016.

In his address, the Chief guest Prof. Purnendu Biswas, Vice Chancellor, West Bengal University of Animal Science and Fisheries, Kolkata, said that small indigenous fishes are important for children as it provides required micronutrients. Dr B. K. Das, Director emphasized that the small indigenous

Inauguration of seed bank by Prof. P. Biswas

fish have more micronutrients than Indian major carp and exotic carp. He said intake of these fishes in daily meal provide the required quantity of micronutrients and vitamins to the family. Publications entitled "Small Indigenous Fishes for nutritional security of the rural economy (in Bangla and English)" and "Hilsa calendar in Bangla" was released on this occasion. Seed bank of Small Indigenous Fishes was also inaugurated at Madanganj. More than 250 fishers and fisherwomen participated in this programme.

Agricultural Education Day

The ICAR has designated the 3rd December as "Agricultural Education Day" to commemorate the birth anniversary of

Student expressing his views

first President of Independent India and Union Minister of Agriculture, Bharat Ratna, Dr. Rajendra Prasad. ICAR-CIFRI has celebrated this day with great fanfare and enthusiasm. The objective of this day was to expose school students to various facets of agriculture and its relevance to country's development, inspire them and attract them towards agriculture, so that they develop interest in agriculture and allied subjects, choose professional career after schooling in some of these courses, engage themselves in agriculture and related activities or become agri-entrepreneurs in future. The Institute organized essay competitions, painting competition, and interaction with Scientists for school children on this day.

World Soil Day

The institute celebrated World Soil day on December 5th, 2016. The main aim of the Soil Day campaign was to create awareness regarding importance of soil in our lives. The theme of World Soil Day 2016 was "Soils and pulses, a symbiosis for life". Shri Madhusudan Ghosh, MLA, Noapara Constituency, W.B. was the Chief Guest of this function. He emphasised on soil conservation and raised concern about the indiscriminate use of pesticides in agriculture. Dr. B.K. Das, Director explained that soil is the foundation of food system which provides nutrition to the people. Dr. S.K. Nag and Dr. Srikanta Samanta delivered lectures on importance of soil health in agriculture. Dr. Ashok Chattopadhyay, Reliance Foundation, students from APC College, New Barrackpore, fish farmers from WB, Bihar and the Scientists of CIFRI participated in the programme.

Lecture by the Chief Guest

Republic Day

The institute celebrated the Republic Day with great enthusiasm and fanfare on 26th January, 2017. Dr. B.K. Das, Director of the institute hoisted the tri-colour and paid rich tribute to the nation. He elaborated that India gained freedom after lot of struggle by the freedom fighters. Hence, preserving the unity of our nation is our sacred duty. In his speech, the Director also recounted the achievements of CIFRI during the last

Republic Day speech by the Director

Swachhata rally

one year and also recalled the golden journey of CIFRI. He remarked that a good working atmosphere and team spirit are the key to success. All the CIFRI staff and members of the family were present on the occasion. *Swachhta* rally and a special swachhta drive were undertaken at Nimai Tirtha Ferry Ghat and Fishery gate bus stand to aware the general public of sanitation and hygiene.

National Productivity Week

National productivity week 2017 was celebrated at the institute during February 13-18, 2017. The theme of the year was "From Waste to Profits-Reduce, Recycle and Reuse". Dr. B.K. Das, Director, explained the ways by which the productivity of the individual Scientist as well as of the institute's can be improved. During the week-long celebration, different activities were organized like essay writing, slogans writing, quiz, painting etc. Closing ceremony was held on February 18 in which prizes/appreciation certificates were awarded to the winners and participants of the different competitions. At Vadodara centre the National Productivity Week was also celebrated and the Productivity day was observed on February 17th, 2017. Different activities were performed to mark the occasion.

Painting by staff children

International Women's Day

International Women's Day is a global day celebrating the social, economic, cultural and political achievements of women. The institute celebrated the Day on March 8, 2017. Dr. B.K. Das presided over the function. According to him the day marks a call to action for accelerating gender parity. Further, he told that the International Women's Day is all about unity, celebration, reflection, advocacy and action. Following 'think global, act local' principle, the Director called for showing respect to all the women employee of the institute and congratulated all the women staff. He recounted the contributions of women to build the modern India.

Institute staff expressing her views

Institute Foundation Day and Curtain Raiser of Platinum Jubilee Year Celebration

The institute celebrated its 71st foundation day on March 17, 2017 at the HQs. Large number of farmers, students, scientists and a team of distinguished personalities attended the proramme. An interaction programme was organized between fishers/fish farmers and Scientists.

Dr. B.K. Das, Director, CIFRI gave a brief account of the institute technologies, activities, outreach programmes and researchable issues. The Chief Guest of the function

Foundation Day celebration

A Fisher getting his doubt clarified

Dr. B. Madhusudana Kurup, former VC of KUFOS, Kochi, in his address, stressed upon the importance of fish for livelihood and nutritional security particularly to the weaker section of the society. He also congratulated the CIFRI Scientists for releasing several policies and protocols for ecosystem-based fisheries management. Dr. Sudhir Raizada, ADG, Inland Fisheries, ICAR; Dr. S.M. Shivaprakasha, Director of Extension, KVAFSU; Dr. N.N. Rai, Director, Hydrology (NE), CWC, New Delhi; Dr. G.N. Chattopadhyaya, Former Professor, Visva Bharati, Santiniketan; Dr. H.C. Joshi, Former Principal Scientist, ICAR-IARI, New Delhi graced the occasion as Guest of Honour. The meritorious children of CIFRI staff members were felicitated on this occasion. A cultural programme was also organised by the CIFRI staff members to celebrate the occasion.

Foreign Visits

Country	Purpose	Date	Participant
Dhaka, Bangladesh	3rd meeting of Joint working Group between Bangladesh and India	October 25-26, 2016	Dr. B.K. Das, Director
Dhaka, Bangladesh	1st Joint Consultation on the sustainable development of inland waterways transport and fish biodiversity conservation	November 2-3, 2016	Dr. B.K. Das, Director

3rd Meeting of Joint Working Group

Mera Gaon Mera Gaurav Activities

The institute has been undertaking various activities for overall agricultural development in the adopted villages under *Mera Gaon Mera Gaurav* programme. Scientists are providing information, knowledge and advisories on regular basis to the farmers of the villages. In continuation of the same, during the period under report, an interaction programme was conducted by the institute at village Saibana, Barasat Block-I, 24 Parganas (N) on October 5, 2016. *Krishi Prayukti Sahayak* from Agriculture Department, Govt. of West Bengal also participated in the interactive session.

A fish health awareness camp was organized at Bantala village in East Kolkata Wetland (EKW) area sponsored by National Aquatic Surveillance Programme on Aquatic Animal Diseases on November 5, 2016, in collaboration with Department of fisheries, Govt. of West Bengal.

Fish health camp at EKW

A *Kisan Gosthi* was organized by the institute at Nilgunj village on November 29, 2016. The programme was organized in collaboration with Departments of Agriculture, Animal Resources, Govt. of West Bengal and Ichapur-Nilgunj Gram Panchayat. A pamphlet on "Climate change and its impact on fisheries" was distributed among the farmers. Dr. B.K. Das, Director ICAR-CIFRI presided over the function. Dr. Asesh Pal, Block Veterinary Officer and Dr. Madhumita Nandi Gosh, Asst. Director of Agriculture (ADA) gave information about the various schemes of the governments. Scientists from ICAR-CRIJAF, Officers from KVK, Ashok Nagar, KVK, Neempeeth and Scientists of CIFRI participated in the programme.

Kisan Gosthi at Nilgunj

Another *Kisan Gosthi* was organised on January 13, 2017 at Akaipur Gram Panchayat for farmers of Akaipur and surrounding villages under Bangaon block of North 24 Parganas district of West Bengal. The programme was executed in collaboration with ICAR-National Aquatic Surveillance Programme on Aquatic Animal Diseases (NASPAD) and ICAR-National Innovations on Climate Resilient Agriculture (NICRA). More than sixty farmers of the five villages of Akaipur Panchayat adopted for MGMG programme participated in the gosthi. Smt. Minati Saha, Pradhan of Akaipur Gram Panchayat; Shri Mahadev Ghosh, Krishi Prajukti Sahayak (KPS) of the village and CIFRI Scientists were present on the occasion.

Kisan Gosthi at Akaipur

Another *Kisan Gosthi* was organized at Babpur, under Khilkapur Gram Panchayat, 24 Parganas (N), Barasat, West Bengal on Jan 30, 2017. More than 500 farmers, mostly women members (75%) of Women Self-Help Groups (SHG) from 10 villages, adopted under MGMG by CIFRI took part in this programme. The BDO of Barasat Block-I; *Panchayat Pradhan*, Khilkapur Gram Panchayat and Dr. B.K. Das, Dr. B.K. Behera and Dr. A.K. Das were also present on the occasion.

Under the MGMG programme the Scientists of Bengaluru centre visited Manchanbele reservoir site in Averehalli village, Ramanagaram District. A total of 25 fisherfolks and the office bearers of the fisher cooperative society attended the meeting where inputs were distributed on regulated use of fishing gears and also discussed other societal issues.

Interaction with farmers at Babpur

Tribal Sub-plan Activities

The institute including its regional centres has been executing several activities for livelihood improvement of the tribals. The Barrackpore headquarters of the institute executed the TSP activities in Purulia and Burdwan districts of West Bengal during this six months period. Thirty five thousand advanced fingerlings of Indian major carps in Chakkadam (7.0 ha.) in Puncha Block; 6000 advanced fingerlings each in Sarak Bundh (1.2 ha.) and Upper Bundh (1.2 ha.) under Kasipur Block were distributed in first week of October 2016. Ninety five tribal families are being benefited from the programme. Likewise 10,000 advanced fingerlings of Indian major carps were stocked in Gardanmari Adibasi Dighi (9.6 ha.) at Karjanachati, Burdwan district, West Bengal for grow out culture and this benefits one hundred tribal families.

An on-field workshop was organized by the Scientists of Barrackpore on inland fisheries management with special emphasis on Beel fisheries under Tribal Sub Plan at Paharpur, Murshidabad, West Bengal on October 22, 2016. 170 fishers including 42 fisher women participated in the programme.

Fish seed stocking in Sarak Bundh

Distribution of pelleted fish feed at Burdwan district

Field demonstration at Murshidabad district

The Allahabad centre is executing the TSP activities in the tribal area of Chandan Chouki in Lakhimpur Kheri district of Uttar Pradesh since 2013 for empowerment of the Tharu tribals. The centre conducted multiple fisheries development activities during October 19-21, 2016 including netting operation, evaluation of earlier stocked fish seed, fishery awareness programme and distribution of fish seed and

Tribal fishers and CIFRI staff with inputs ready for distribution

Fish seed stocking at Lakhimpur Kheri

feed in the area. More than 50 tribals participated in the programme and received inputs. The tribal fish farmers are trained in diversification of culture practices like integrated fish farming and adoption of appropriate fishery technology and management techniques.

The region witnessed significant impact of the fisheries development activities undertaken by the centre. The current estimated average fish production from the region considerably increased to 2.5 - 3.8 tons/ha, from less than 1.5 tons/ ha before initiation of the programme. Further, the tribal farmers expanded fish farming activities in all the available patches of the ponds and derelict waters in the region, owing to intensive awareness campaigns, trainings and empowerment efforts initiated by CIFRI. Some farmers have also started rearing fish in nursery and selling of fish seed after this initiative.

The Bengaluru centre distributed fishery requisites and safety equipments to the members of the Tribal Fisheries Co-operative Society of Banasura Sagar Reservoir, Wayanad, Kerala on February 6, 2017. Smt. J. Mercy Kkutty Amma, Minister of Fisheries and Harbor Engineering, Govt. of Kerala graced the ceremony in which 8 fiberglass coracles and 16 life jackets were distributed benefitting 16 families. She hoped that the Karapuzha model will be imitated in other parts of the state to enhance the livelihood of fishing communities. The District *Grama Panchayat* Member, Scientist-in-charge of Bengaluru centre, representatives of local Panchayat and senior officials of Kerala Fisheries Department and Kerala State Electricity board were also present on the occasion.

The Minister distributing fiberglass coracle and life jackets

Project proposals of ICAR-CIFRI for livelihood improvement of the Tribal people

Glimpses of Activities under *Swachh Bharat Abhiyaan*

Swachha Bharat pledge at the institute headquarters

Cleaning campaign at Seoraphuli ghat, W.B.

Glimpses of Activities under *Swachh Bharat Abhiyaan*

Cleaning of campus pond at Barrackpore

Donating garbage bin at Ferry Ghat, Barrackpore

Villagers participating in sanitation campaign at Maniktala village, N. 24 Parganas, W.B.

Cleaning campaign at Saibana village, Barasat block, North 24 Parganas, W.B.

Sanitation campaign at a Sundarbans village

Hon'ble Minister of Fisheries, Govt. of Assam Shri Parimal Suklabaidya participated in the special *Swachh Bharat* programme organized by ICAR-CIFRI Regional Centre, Guwahati

Glimpses of Activities under *Swachh Bharat Abhiyaan*

Swachh Bharat oath administered by Staff of ICAR-CIFRI Bengaluru Centre

'Go Green' initiative by ICAR-CIFRI Bengaluru centre at Manchanbele reservoir site

Sanitation campaign by ICAR-CIFRI Kochi centre

Sanitation campaign by ICAR-CIFRI Vadodara centre

Flash back : CIFRI @ 1990s

The institute has completed 50 years of its existence on March 16, 1997 and the Golden Jubilee Year was celebrated through organizing various events like National Workshop, National Consultation, National Seminar, delivering a series of Talks etc.

Inauguration of Golden Jubilee year celebrations

During the nineties the institute was led by the Stalwarts, Dr. A.G. Jhingran, Dr. S.P. Ayyar and Dr. M. Sinha as regular Directors. Budget of the institute was ₹ 315.8 lakh in 1990-91 which reached to ₹ 749 lakh in 1999-2000.

Dr. A.G. Jhingran

Dr. S.P. Ayyar

Dr. M. Sinha

In infrastructure development, the foundation stone for a new three-storied building was laid at Allahabad Centre on 31st May, 1990 by the Hon'ble Deputy Prime Minister of India, Shri Devi Lal. An agreement has been signed in 2000 between HOUSEFED and CIFRI to purchase 16,400 sq ft new Office-cum-Laboratory spaces near the Assam State Secretariat at Guwahati for housing the North-eastern Regional Centre. Four new divisions i.e., Environmental Monitoring & Fish Health Protection, Floodplain Wetlands, Resource Assessment and Hilsa Division have been created in addition to the three existing divisions viz., Riverine Fisheries, Reservoir Fisheries and Estuarine Fisheries during 1993-94.

Foundation stone laying at Allahabad

The institute made remarkable progress in research outputs. In Hilsa research, experiments have confirmed the upstream migration of hilsa, across the Farakka barrage during the flood season

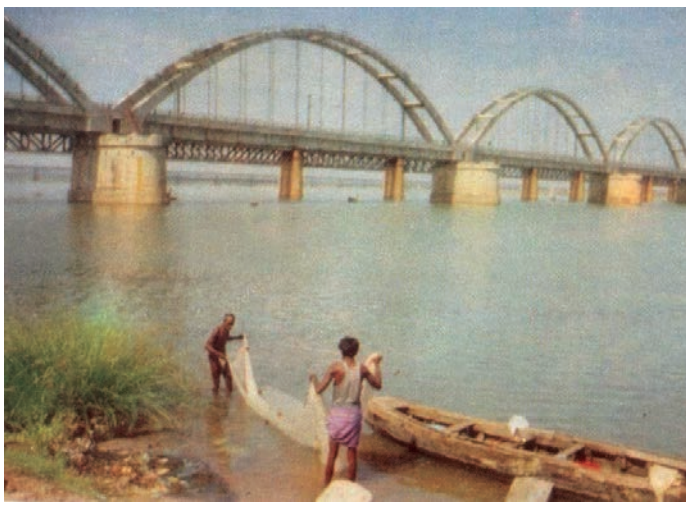
Hilsa tagging operation

Improved model of Hilsa hatchery

A new hatchery was designed which encompassed recirculation device coupled with constant aeration and Hilsa were successfully bred during the monsoon. It has been reported for the first time in 1991-92 that Hilsa breeding takes place in Matlah estuarine system also. In Hilsa restoration plan, CIFRI initiated a ranching programme to restock the depleted stretches of the Ganga with the seed of *Tenualosa ilisha*. Wanton destruction of hilsa juveniles by indiscriminate exploitation through small meshed nets in the upper stretch of the Hooghly estuary was estimated around 43 MT during 1993-94.Experiments in 1990-91 on hilsa pawn showed that the stock were more active and had better survival by treating with thyroxine.

It was concluded during 1995-96 that the Hooghly estuary has become more congenial to spawning as well as larval growth of hilsa, after the construction of Farakka barrage largely due to increased discharge of freshwater. The study in 1999-2000 further showed that the hilsa populations of Ganges and Brahmaputra system were part of the same random mating population, whereas, that of Mahanadi was a different subpopulation.

The Institute made rapid survey of ecology and fishery of River Ganga during 1995-1996 from Tehri to Gangetic deltaic Sunderbans for assessment of hydrology, primary production and biological parameters. Appreciable improvement in dissolved oxygen content of water was noticed in the middle and lower stretches including estuarine system owing mainly to the positive results of GAP and increased influx of freshwater after commissioning of Farakka barrage. However, concerns have been raised for the declining average annual fish production in all the stretches due to siltation, increased water abstractions and irrational fishing. Similarly, a rapid survey of River Mahanadi from its origin at Pahrsiya to its estuarine-mouth at Paradip was undertaken for the first time during 1995-96. The survey revealed existence of 78, 24 and 110 fish species in the upper, middle and lower stretches respectively, indicating good fish biodiversity. The institute also completed the programme of rapid survey of river Godavari during 1998-99 and found no serious habitat degradation and deterioration of water quality in its 1465 km long course. However, in River Yamuna (1994-95) severe stress in the middle stretch; maximum at Delhi followed by Agra, Mathura and Firozabad was observed.



Drag net operation in Godavari (Rajahmundry)

CIFRI conducted a rapid survey in 1998-99 for assessment of production potential of 7 small reservoirs in the states of Haryana, Punjab and Himachal Pradesh to characterize the water bodies based on their ecology, biodiversity and fish yield potential. Similarly the institute surveyed nine reservoirs in Tamil Nadu. A systematic data base was created in 1999-2000 regarding the status of fishery resources of Kerala backwaters for the first time.

Aliyar reservoir in T.N.

Chinese dip net in Kerala backwaters

In *beel* fisheries management a design for pen enclosure suitable to the *beel* ecosystem in Gandak basin was finalized in 1991-92. The design was based on a semi-rigid structure covering a wide area of 1500m^2. Pilot-scale studies were done in Akaipur beel to culture the giant freshwater prawn, *Macrobranchium rosenbergii* in pen and a rich harvest was achieved during the summer of 1995-96.

Releasing of prawn seed into the pen by Sh. Amal Dutta, Hon'ble MP

CIFRI study during 1997-98 revealed that the quantum of major pollutants discharged into the Damodar River was approximately 1,11,700 MLD industrial effluents, 80,000 litres domestic wastes and 10,000 tonnes of fly-ash per day. The other toxicants released were also estimated. It has been concluded that a gradual destabilization of the ecosystem of river Damodar was occurring and immediate remedial measures were called for.

Solid waste encroaching Damodar

The institute was continuing its efforts in environmental monitoring of the river Ganga. Under this programme, the pesticide residue level in water, sediments and tissues was being monitored on a regular basis. Further, the Institute continued to monitor the heavy metal concentration in the estuarine waters. The Institute has also studied the bacterial load of the river Ganga from Haridwar (Uttar Pradesh) to Nurpur (West Bengal). The study during 1997-98 showed that Ganga water was not fit for drinking or any house-hold purposes directly. However, fish flesh was free from bacterial infection and could be consumed after processing.

The Institute continued with the investigations on the fish disease including Epizootic Ulcerative Syndrome (EUS) on a national scale. A methodology has been developed in 1994-95 to quantify the presence of urceolariid ciliate parasites *Trichodina* sp. and *Tripartiella* sp. as indicators of stressed environment in aquatic ecosystem. A standard methodology was devised in 1992-93 for creating a database on inland fisheries resources.

Impact study of thermal discharge on aquatic life in 1995-96 showed that the embryonic stage of *Catla catla* has high thermal sensitivity. It was observed that the thermal impact was marginally faster on fry than at embryonic level, due to resistance offered by the egg shell. In a similar experiment in Rihand Reservoir during 1996-97 it was found that among major carps, young ones of Labeo calbasu were marginally resistant to higher temperature. Further, it has been found that a temperature range of 37-40° C was above the tolerance

limit of most of the planktonic organisms. In an another experiment in 1999-2000, a significant increase in plasma cortisol, glucose and cholesterol values and decrease in chloride and muscle/liver glycogen values were observed in physiological responses in fish to stressors.

Economic evaluation studies showed that winter migratory fishery was highly remunerative activity in the Hooghly estuary contrary to subsistence character of riverine fisheries of freshwater zone. The institute has produced 775 scientific publications during this decade.

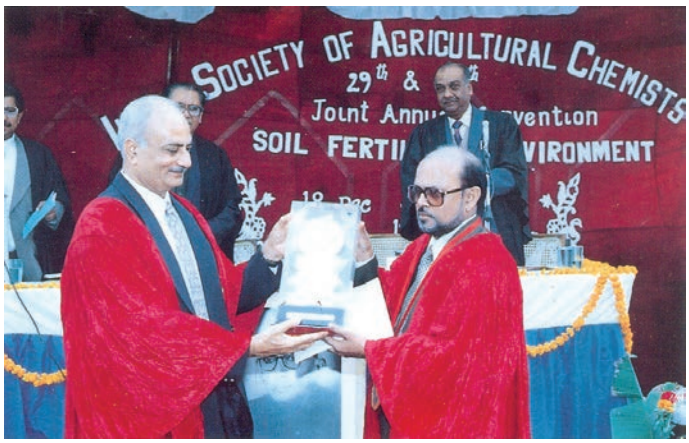
Winter bag net at Hooghly-Matlah estuary

The achievements of the Krishi Vigyan Kendra of the Institute at Kakdwip was also phenomenal. As a result of its efforts substantial increase in the yield of crops was achieved. It popularised the economically viable betelvine cultivation among the farming communities on a small scale basis.

Demonstration on cabbage by KVK and Betelvine cultivation

Commensurate with the commendable research achievements, Scientists of the institute were conferred with many Awards and Honours. ICAR Award for Team Research (1991-93) by Mrs. G.K. Vinci, Dr. V.V. Sugunan and Dr. V.K. Unnithan; Jawaharlal Nehru Award for outstanding post-graduate agricultural research (1993) by Dr. S. Vijoy Nandan; ICAR National Fellowship (1994-95) by Dr. K. R. Naskar, Indian Science Congress Association Young Scientist' Award by Dr. Srikanta Samanta (1995); Zoology Congress Gold Medal by Dr. V.R.P. Sinha (1995); Fellowship of Indian Society of Agricultural Chemists (1997) and Fellowship by the Royal Society of Chemistry, London (1999-2000) by Dr. K. Chandra were some of them. Dr. Chandra was authorized to use the designation 'Chartered Chemist'. He was also awarded the D. Sc. Degree by the Allahabad University in 1999-2000.

Dr. M. Sinha was honoured with the Param Krishi Vaigyanik Award (1996-97) by the Indian Society of Agricultural Chemists besides the Fellowship of the Society. He was also awarded the Fellowship of Nature Conservations, Muzaffarnagar (1998-99). Further, he was also awarded Fellowship of Zoological Society of Calcutta, in the same year. Dr. Sinha was the fishery expert in a team of a mission constituted by DARE to Bhutan during 1999. He was also awarded Fellowship by the Association of Aquaculturists, Bhubaneswar (1999-2000).



Dr. M. Sinha receiving Param Krishi Vaigyanik Award

Dr. K.K. Vass was elected as a member of the National Executive Council of National Institute of Ecology, New Delhi (1996-97). Dr. V.K. Unnithan was nominated as a Member of the Coastal Zone Management Committee (1997-98) and Member of the Fisheries Resource Management Society, constituted by the Govt. of Kerala (1998-99). Dr. V.V. Sugunan served as an Expert Panel Member in the Conference on Aquaculture in the third millennium, held at Bangkok in 2000. Shri M.M. Bagchi has been elected as the fellow of the Institute of Chemists (India), Calcutta (1999-2000).

Compiled and edited by: Dr. Arun Pandit

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद
Agrisearch with a human touch

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सिफरी समाचार

अनुसंधान उपलब्धियाँ

गंगा नदी की एम्फ्रिड्रोमस प्रजाति, जोनियस कोईटर (हैमिलटन, 1822) के प्रजनन चक्र पर जलवायु परिवर्तन का प्रभाव

अप्रैल 2015 से सितम्बर 2015 तक गंगा नदी के तीन सैम्पिलंग केन्द्रों, पटना, फरक्का और त्रिवेणी में अभिगमन जलजीव प्रजाति, *जोनियस कोईटर* के प्रजनन चक्र का अध्ययन किया गया। इसके अंतर्गत इनके प्रजनन के लिये उपयुक्त जलवायु तथा जलवायु परिवर्तन से इनके प्रजनन पर प्रभाव का आंकलन किया गया। यह देखा गया कि ये लगभग वर्ष भर ही प्रजनन करते हैं तथा इनके जननांग के परिपक्व होने तथा प्रजनन के लिये उपयुक्त तापमान, 23 से 25 डिग्री सेंटीग्रेड का होना आवश्यक है। 20 डिग्री से0ग्रे0 से कम अथवा 32 डिग्री से0ग्रे0 से अधिक तापमान में इनका अंडजनन बाधित होता है। ये प्रजनन के लिये बारिश पर निर्भर नहीं करते है। अतः यह देखा गया कि ये प्रजातियां प्रायः वर्ष भर प्रजनन करती हैं एवं जलवायु परिवर्तन का इनके प्रजनन पर न्युनतम प्रभाव दर्ज किया गया।

यू. के सरकार, जी कर्नाटक, डी सुधीशन, एस दास सरकार, के रॉय, अरूण बोस, सौरभ नन्दी, संदीपन गुप्ता, पी के श्रीवास्तव एवं विनोद कुमार

कावेरी नदी में गौरामी प्रजाति, *ट्राइकोगेस्टर लेलियस* का प्रथम बार देखा जाना

ड्वार्फ गौरामी के नाम से प्रचलित गौरामी प्रजाति, *ट्राइकोगेस्टर लेलियस* सामान्यतः बंगलादेश, नेपाल, पाकिस्तान तथा पूर्वी एवं उत्तर–पूर्वी भारत (अरूणाचल प्रदेश, असम, बिहार, मणिपुर, उत्तरांचल, उत्तर प्रदेश और पश्चिम बंगाल) के जलक्षेत्रों में पाई जाती है। इसकी वाइल्ड प्रजाति अन्य देशों, जैसे सिंगापुर, अमेरिका तथा कोलम्बिया आदि में पाई जाती है। भारत में इस प्रजाति को अलंकारी मछली के तौर पर भी निर्यात किया जाता है। हाल में भारत के दक्षिण भाग में बेंगालुरू के निकट कावेरी नदी (चमराज सागर जलाशय) में इस प्रजाति को प्रथम बार देखा गया। अलग–अलग ऋतुओं में इस मछली के कुल नौ प्रजातियों को एकत्र किया गया है पर जलाशय में इसकी संख्या बहुत ही कम पाई गई है। ये मछलियां ऐसे जलक्षेत्रों में पाई जाती हैं जहां जल का वेग धीमा होता है और पौधे अधिक होते हैं। आई यु सी एन के अनुसार यह प्रजाति खतरे की दृष्टि से सुरक्षित है।

वी एल राम्या, सिबिना मोल, डी एस कृष्णाराव, पी पणिक्कर एवं एम ई विजयकुमार

सुन्दरवन में ट्राप जाल द्वारा पारंपरिक मत्स्ययन तकनीक, 'आतोल' का प्रयोग

सुन्दरवन के नहरों में पारंपरिक मत्स्ययन तकनीक, 'आतोल' का प्रयोग किया गया। इसमें मानसून के समय ट्राप जाल द्वारा मछलियों को पकड़ा जाता है। ये ट्राप जाल जल की गहराई के अनुसार अलग–अलग आकार में बांस के तख्तों और छोटी छिद्रों वाले जाल से बने होते हैं। ये ट्राप जाल आमतौर पर चौकोर होते हैं तथा इनके एक छोर का भाग लंबवत तौर पर बांस के महीन तारों से बने जाली से ढका होता है। जाल के दूसरे छोर पर एक छोटी थैलीनुमा बना होता है। जाल के ऊपर भाग के पिछले तरफ में एक छिद्र होता है जिसमें से फंसी हुई मछलियों को बाहर निकालते हैं। आमतौर पर 'आतोल' जाल की लंबाई, चौड़ाई और ऊँचाई क्रमशः 30 इंच, 14 इंच और 24 इच होता है। इस तकनीक का प्रयोग सुन्दरवन के नहरों में जून से सितम्बर महीने के बीच किया जाता है जब ये नहर जल से लबालब भरे होते हैं। हालांकि इस प्रकार के मत्स्ययन के लिये कम गहराई वाले जलक्षेत्र जिनमें जलप्रवाह कम होता है, उपयुक्त माने जाते हैं। इन जालों को आमतौर पर रात में लगाया जाता है। मानसून के समय इन जालो से लगभग 200 से 500 ग्रा0 प्रति जाल प्रति रात मछलियों को पकड़ा गया। आजकल अधिकतर सस्ता होने के कारण पोलिथिन से बने आतोल जाल का प्रयोग होता है। इन जालों से पकड़ी गईं मत्स्य प्रजातियां हैं – *चन्ना प्रजाति, मेटासेम्बेलस, मैक्रोनेथस, ट्राइकोगेस्टर, पुन्टियस, नेन्दस, एम्बिलिफेरिंगोडोन मोला, चन्दा नामा, पराम्बेसिस, ग्लोसोगोबियस, मिस्टस* (कैटफिश) एवं छोटी झींगा प्रजातियां।

प्रोनोब गोगोई, एस के दास, आर के मान्ना, टी एन चानु, एस के कौशलेष एवं एम रामटेके

केरल के कोरापुरा ज्वारनदमुख में क्रश्टेशिया मत्स्य प्रजातियों की पकड़

केरल का कोरापुरा ज्वारनदमुख लगभग 40 कि0मी0 लंबी एक छोटी एवं छिछली नदी है जिसका मुहाना समुद्र से एक कि0मी दूर है। इस ज्वारनदमुख से मछलियों एवं केकड़ों को गियर जालों, हुक एवं लाइन द्वारा पकड़ा जाता है। इस क्षेत्र में सीप और घोंघा पालन भी किया जाता है। इस ज्वारनदमुख में कुल 59 मत्स्य प्रजातियों को दर्ज किया गया है जिनमें शेल मछलियों की अधिकता देखी गई। शेल मछलियों में *ऐसेटस इंडिकस, पीनियस मोनाडोन, फेनेरोपीनियस इंडिकस, मेटापीनियस डोबसोनी, एम मोनोसेरस, स्काइला सेरेटा, एस ट्रांकोबेरिका, पोर्टुनस सैंगिनोलेन्टस, पोर्टुनस पेलागिकस, मेरेट्रिक्स* एवं *क्रेसोसट्रिया मेड्रससेन्सिस* आदि। वर्ष 205–16 में कोरापुरा जलाशय में क्रश्टेशिया मत्स्य प्रजातियों का प्रतिशत 78 से 87 प्रतिशत दर्ज किया गया। एसेटस इंडिकस का उपयोग मुख्यतः सूखी मछली तैयार करने मे किया जाता है जो रू 300 से 800 प्रति कि0ग्रा0 बेचा जाता है। अतः स्थानीय एवं अंतर्राष्ट्रीय बाजार में एसेटस इंडिकस की मांग बहुत अधिक है। इसी प्रकार केकड़ों की भी मांग अधिक है और इसे रू0 300 से 700 प्रति कि0ग्रा0 बेचा जाता है। अतः यहां क्रश्टेशिया मत्स्य प्रजातियों की पकड़ आजीविका का मुख्य साधन है। ।

वी एल राम्या एवं एस के दास

तमिलनाडु के भवानीसागर जलाशय की मूल उत्पादन में स्थानिक भिन्नता

किसी जलाशय के सफल प्रबंधन हेतु इसकी मूल उत्पादन का आंकलन करना आवश्यक होता है और यह मूल उत्पादन इसके जल की गुणवत्ता, पोषक तत्वों की उपलब्धता और जल प्रवाह एवं इसके प्रभाव पर निर्भर करता है। अतः वर्ष 2016 से 2017 के बीच भवानीसागर जलाशय के मूल उत्पादन में स्थानिक भिन्नता के अध्ययन के लिये इस जलाशय (7500 हे0 जलक्षेत्र) को

तीन क्षेत्रों में बांटा गया– 1. लोटिक (ऐसे मीठाजल क्षेत्र जिनमे जल के वेग अधिक होता है), 2. लेन्टिक (ऐसे मीठाजल क्षेत्र जिनका जल स्थिर होता है), एवं 3. दोनों के बीच का मध्यवर्ती क्षेत्र। औसतन, मूल मत्स्य उत्पादन सबसे अधिक मध्यवर्ती क्षेत्र (210.9 मि0ग्रा0 कार्बन प्रति घन मी0 प्रति घंटा) में और लेन्टिक क्षेत्र में (138.9 मि0ग्रा0 कार्बन प्रति घन मी0 प्रति घंटा) में दर्ज किया गया पर सबसे कम लोटिक क्षेत्र में (26.5 मि0ग्रा0 कार्बन प्रति घन मी0 प्रति घंटा) हुआ जिसका कारण जल का अधिक वेग था। भवानीसागर जलाशय के मूल उत्पादन का ऊर्जा बहाव 6830 कैलोरी प्रति वर्ग मी0 प्रति दिन निर्धारित किया गया है। इससे प्रकाश संश्लेषण में 0.32 प्रतिशत की वृद्धि हुई एवं परिणामस्वरूप 1.2 प्रतिशत ऊर्जा रूपान्तर के कारण औसत मत्स्य उत्पादन 467.4 कि0ग्रा0 प्रति हे0 प्रति वर्ष दर्ज किया गया है।

रानी पालानिस्वामी, थंकम थेरेसा पॉल, एस मनोहरन एवं ऊषा उनिथन

केरल के पीची एवं पोथुण्डी जलाशयों में प्लवकभोजी साइप्रिनिडा प्रजातियों की संभावना

केरल के पीची जलाशय में देशी साइप्रिनिडा मत्स्य प्रजातियां 0.032 कि0ग्रा0 प्रति हे0 पाई गई हैं जबकि इस जलाशय का संभावित उत्पादन 179.80 कि0ग्रा0 प्रति हे0 आंका गया है। अतः संरक्षित क्षेत्र में स्थित इस जलाशय में अलगी ब्राउजर प्रजातियों का आधिक्य है एवं इनके प्रजनन एवं संवर्धन तकनीको का मानकीकरण भी किया गया है। इसलिये जलाशय के संभावित मत्स्य उपज के लक्ष्य को प्राप्त करने के लिये प्रजाति संवर्धन तकनीकों का विकास करना आवश्यक है। इसी प्रकार, पोथुण्डी जलाशय में प्लवकभोजी प्रजातियों का संभावित उपज 127.8 कि0ग्रा0 प्रति हे0 आंका गया है जबकि वास्तविक उपज केवल 20.45 कि0ग्रा0 प्रति हे0 है। इसलिये इस जलाशय के प्रबंधन तकनीकों में तीव्र सुधार की आवश्यकता है। अतः इंडियन मेजर कार्प प्रजातिया जो प्लवक भोजी भी होती हैं का उपयुक्त प्रबंधन आवश्यक है।

रानी पालानिस्वामी, थंकम थेरेसा पॉल, एस मनोहरन, ऊषा उनिथन एवं यु के सरकार

खुले जलक्षेत्र में अविकसित कार्प मछली की अंगुलिकाओं की घेरे (पेन) में पालन की तकनीक

असम के नगांव के मेर बील, जो एक खुला जल क्षेत्र है, में अविकसित कार्प मछली की अंगुलिकाओं को 20 हे0 वाले पेन क्षेत्र में पालन किया गया। इसके लिये अगस्त 2015 में बांस के खम्भों से चार बड़े चौकोर पेन क्षेत्रों (प्रति पेन – 2500 वर्ग मी0) को स्थापित किया गया। इन पेनक्षेत्रों को पहले अवांछित जलीय मेक्रोफाइट एवं जीवों से मुक्त कर इनमें चूना डाला गया। इसके बाद, इनमें कार्प मछलियों की 4 देशी प्रजातियों, लेबियो रोहिता (13.5±0.46 से0मी0य 31.5±3.09 ग्रा0); गिबेलियन कतला (14.1±0.57 से0मी0य 46.2±5.72 ग्रा0); सिरहिनस मृगला (10.5±0.49 से0मी0य 12.1±1.91 ग्रा0); एल गोनियस (11०40०26 से0मी0य 17०41०36 ग्रा0) और 2 विदेशी प्रजातियों, टेनोफेरिंगोडोन इडेला (14.0±0.60 से0मी0य 40.7±5.5 ग्रा0) और हाइपोथेलमिक्थिस मोलिट्रिक्स (17.0±2.57 से0मी0य 72.2±2.85 ग्रा0) को 5 मछली प्रति वर्ग मी0 क्षेत्र की दर से संग्रहित किया गया। इन संग्रहित मछलियों को संपूरक भोजन उनके शारीरिक भार के 3 प्रतिशत की दर से दिया गया जो बाद में (बील क्षेत्र में अंगुलिकाओं को डालने से पहले) धीरे–ध्ीरे घटा कर केवल 0.5 प्रतिशत कर दिया गया। शीतकाल में (दिसम्बर से जनवरी तक) मछलियों के विकास एव उत्तरजीविता के लिये जल के प्राचलों का निरीक्षण किया गया। लगभग 5 महीनों के बाद मछलियों के विकास की जांच की गई। यह देखा गया कि विकास दर मृगल मछली में 1.45, गोनियस में 1.14, ग्रास कार्प में 1.11, रोहू में 0.86, कतला में 0.86 और सबसे कम सिलवर कार्प में 0.70 हुआ है। औसत भार (150.9 ग्रा0) वाली अविकसित अंगुलिकाओं की उत्तरजीविता 86 प्रतिशत पाई गई। इसके बाद इन अंगुलिकाओं को बील क्षेत्र में 2000 अंगुलिका प्रति हे0 की दर से संग्रहित किया गया। इस पालन का लाभ–लागत अनुपात 1.92 था। अतः अविकसित एवं कमजोर अंगुलिकाओं के पेन पालन आर्थिक दृष्टि से लाभकारी है।

प्रनव दास, बी के भट्टाचार्य, डी देबनाथ, ए के यादव, एस येंगोपम, के के सरमा, ए ककाती एवं बि के दास

असम के दीपर बील में *बंगाना डेरो* प्रजाति की उपस्थिति

अंतर्राष्ट्रीय तौर पर विख्यात असम का दीपर बील एक आर्द्रक्षेत्र है और इसका जल विस्तार क्षेत्र 589 हे0 है। इस आर्द्रक्षेत्र में बहुत सी ऐसी विलुप्तप्राय जीवों एवं पौधों की प्रजातियों का निवास है जो आईयुसीएन जैसी अंतर्राष्ट्रीय संस्था के 'रेड लिस्ट' में है। संस्थान के गुवाहाटी केन्द्र के अध्ययन के अनुसार, इस बील में ऐसी विलुप्तप्राय जीवों एवं पौधों की लगभग 67 प्रजातियां रहती हैं। अक्टूबर 2016 में इस बील से प्रथम बार साइप्रिनिडा प्रजाति की *बंगाना डेरो* मछली के 28 नमूनों को एकत्र किया गया। इन मछलियों की लंबाई 8.77 से 10.14 से0मी0 तथा शारीरिक भार 6.74 से 10.61 ग्रा0 पाया गया। अतः असम के बसिष्ठ एवं कालामोनी नदियों में *बी डेरो* की उपस्थिति यह बताता है कि यह प्रजाति मुख्यतः पहाड़ी क्षेत्रों मे वास करती है तथा शीतकाल में निचली क्षेत्र की तरफ प्रवास के लिये आती है।

शिमांकु बोरा, बी के भट्टाचार्य, बी जे सौद, ए के यादव, प्रनव दास, सोना येंगोपम, दीपेश देबनाथ, नीति शर्मा, एव ंए ककाती

असम के बाढ़कृत आर्द्रक्षेत्रों की मछलियां, पुन्टियस सोफोर एवं मिस्टस कार्सियो की उत्पादकता एवं गोनेडो-सोमेटिक इंडेक्स

असम के बाढ़कृत आर्द्रक्षेत्रों की मछलियां, *पुन्टियस सोफोर* एवं *मिस्टस कार्सियो* की गोनाड परिपक्वता, निषेचन अवधि एवं उत्पादकता का अध्ययन किया गया। असम के नगांव और लखीमपुर जिलों से अप्रैल 2015 से मार्च 2016 के दौरान *पी सोफोर* के 523 नमूनों (लंबाई – 4.2 से 9.2 से0मी0 के बीच; शारीरिक भार– 2.48 से 10.68 ग्रा0 के बीच) तथा *एम कार्पियो* के 542 नमूनों (लंबाई – 5.9 से 10.1 से0मी0 के बीच; शारीरिक भार– 2.02 से 9.64 ग्रा0 के बीच) को एकत्र किया गया। अध्ययन के दौरान *पी सोफोर* के नर एवं मादा मछलियों का गोनेडो–सोमेटिक इंडेक्स क्रमशः 0.001 से 8.54 के बीच तथा 0.02 से 19.64 के बीच पाया गया। मादा मछली का गोनेडो–सोमेटिक इंडेक्स जून माह में 15.41 था जो अगस्त माह में बढ़कर 19.64 हुआ और फिर सितम्बर माह में घट कर 10.82 हुआ। इसी प्रकार नर सोफोर मछली का गोनेडो–सोमेटिक इंडेक्स अगस्त महीने में सबसे अधिक (8.54) था पर सितम्बर माह में घट कर केवल 3.87 रह गया। *एम कार्पियो* के नर एवं मादा मछलियों का गोनेडो–सोमेटिक इंडेक्स क्रमशः 0.001 से 9.54 के बीच तथा 0.01 से 30.32 के बीच पाया गया। इसकी मादा मछली का गोनेडो–सोमेटिक इंडेक्स (जीएसआई) जून माह में 26.52 था जो अगस्त– सतम्बर माह में बढ़कर 30.12 से 30.32 हो गया। अक्टूबर माह में जीएसआई के घटने से

स्पॉनिंग में वृद्धि हुई। एम कार्पियो के नर मछलियों का जीएसआई अप्रैल में 2.48 था जो अगस्त माह में बढ़कर 9.54 हुआ और फिर अक्टूबर माह में घटकर 2.21 रह गया। *पी सोफोर* की उत्पादकता 434 से 11854 के बीच थी तथा एम कार्पियो में यह 3451 से 19854 रही।

बी के भट्टाचार्य, डी देबनाथ, ए के यादव ए एवं बी जे सौद

ओडिशा के पारादीप में मछलियों के मृत्यु की जांच

ओडिशा के पारादीप में जगतसिंहपुर जिले में बहुत सी कतला, रोहू, और मृगल की तरूण मछलियों की मृत्यु की जांच के कारणों को पता लगाने के लिये संस्थान से वैज्ञानिकों की एक टीम ने बाटा नदी का निरीक्षण किया। जल के नमूनों की जांच में जल में घुलित ऑक्सीजन की मात्रा बहुत कम पाई गई तथा घुलित ठोस तत्व एवं खारापन अधिक पाया गया। ऑक्सीजन की मात्रा 1 पीपीएम से कम होने का अर्थ है– मछलियों के विकास एवं भोजन ग्रहण करने में अवरोध एवं इससे उनकी मृत्यु। जल एवं मछलियों के उत्तको के विश्लेषण करने पर जल में लेड की मात्रा 75 पीपीबी पाया गया जो विशेषज्ञों के अनुसार जलीय जीव के उत्तरजीविता के लिये हानिकारक है। इसी प्रकार मछलियों शरीर एवं गिल में भी लेड की मात्रा निर्धारित परिमाण से अधिक पाया गया। कीटनाशकों का जमाव जल में तो नहीं पर मछलियों के उत्तकों में पाया गया जो मानव उपभोग की दृष्टि से सुरक्षित नहीं है। इस अध्ययन से यह पता चला कि जल प्रदूषण के कारण जल में घुलित ऑक्सीजन की मात्रा कम हो जाती है जिससे मछलियां, विशेषकर भारतीय मेजर कार्प प्रजातियों की मृत्यु हो जाती हैं। जल प्रदूषण का कारण जलक्षेत्र में घरेलू मलजल, कारखानों का गंदा जल, जलक्षेत्रों का सही प्रबंधन न होना आदि है।

एस के नाग, ए क साहू, दीपा सुधीशन एवं बि के दास

मानव उपभोग वाली मछलियों का सूक्ष्मपोशकीय रूपरेखा

मछलियां सूक्ष्मपोषक तत्वों जैसे, विटामिन एवं खनिज तत्वों से भरपूर होती हैं तथा मनुष्य के शरीर में इन तत्वों के कमी की पूरा करने में सक्षम होती हैं। इसलिये देश में उपलब्ध आहार के लिये प्रयुक्त मछलियों के पोषक तत्वों का प्रोफाइलिंग किया गया। इसमें यह देखा गया कि समुद्री मछलियों में सोडियम और पौटैशियम, छोटी देशी मछलियों में कैल्शियम, आयरन और मैंगनीज, शीतजल क्षेत्रों की मछलियों में सेलेनियम तथा खाराजल की मछलियों में फॉस्फोरस तत्व अधिक पाये जाते हैं। समुद्री मछली, *सारडीनेला लोंगिसेप* तथा *एपिनेफिलस* और छोटी देशी मछलियों में वसा–घुलित विटामिन पाये जाते हैं। मछलियों की सूक्ष्मपोषक तत्वों के विषय में अधिक जानकारी के लिये संस्थान की वेबसाइट, http://www.cifri.res.in/nutrifishin/index.php (NUTRIFISHIN) देखें।

बि पि मोहान्ति, एस गांगुली, ए महान्ति, टी मित्रा एवं डी करूणाकरण

मछलियों में उपस्थित डीएचए एवं ईपीए तथा इनकी अम्लीय रूपरेखा

मछलियों में उपस्थित वसा अम्ल जैसे, डीएचए (Docosahexanoic acid) तथा ईपीए (म्पबवेंचमदजंदवपब बपक) बहुत सी गंभीर बिमारियों जैसे, एथेरोसिरोसिस, डिमेन्सिया, गठिया, अलजीमर आदि के इलाज में लाभकारी परिणाम देते हैं। साथ ही ये मछलियों ओमेगा–3 फैटी एसिड से भी भरपूर होती हैं। अब तक कुल 39 मछलियों में उपस्थित डीएचए और ईपीए संबंधित सूचनाये उपलब्ध हैं। इन मछलियों में *टेनुआलोसा ईलिशा, सारडीनेला लोंगिसेप, नेमिटेरस जेपोनिकस* तथा *एनाबस टेस्टुडिनस* में डीएचए और ईपीए अधिक मात्रा में उपलब्ध होते हैं।

बि पि मोहान्ति, डी करूणाकरण, एस गांगुली, ए महान्ति एवं टी मित्रा

हुगली–भागीरथी नदी क्षेत्र के मछुआरों की आजीविका में मात्स्यिकी की भूमिका

हुगली–भागीरथी नदी क्षेत्र की मात्स्यिकी पर लाखों मछुआरों की आजीविका निर्भर करती है। आंकड़ों के अनुसार, लगभग 20,390 मछुआरे दक्षिणेश्वर के निचले क्षेत्र तथा 5600 मछुआरे दक्षिणेश्वर से फरक्का के बीच हिलसा मात्स्यिकी से जुड़े हुये हैं। सागर द्वीप से फरक्का के बीच वाले क्षेत्र में वास करने वाले 500 मछुआरों का अध्ययन किया गया जिसमें यह देखा गया कि 89 प्रतिशत मछुआरों का मूल व्यवसाय मछली मारना है जबकि शेष 11 प्रतिशत अन्य व्यवसाय जैसे, मछली बेचना, नाव चलाना, रिक्शा/वैन रिक्शा चलाना एवं छोटे व्यवसाय आदि से जुड़े हुये हैं। इनके आय उपार्जन में मत्स्ययन से लगभग 70 प्रतिशत आय प्राप्त होता है। इसके ऊपरी क्षेत्र में वास करने वाले मछुआरे मत्स्ययन के अलावा अन्य व्यवसायों से भी युक्त होते हैं क्योंकि केवल मत्स्ययन से उनके भरण–पोषण के लिये पर्याप्त आय प्राप्त नहीं हो पाता है। जिस समय अधिक मछली नहीं पकड़ा जाता, उस समय ये मछुआरें अन्य कार्यों जैसे, कृषि, मजदूरी, छोटे व्यवसाय तथा रिक्शा/वैन रिक्शा चलाना आदि आय द्वारा उपार्जन करते हैं।

अरूण पंडित, ए एक्का, आर के रमण, एस सामन्ता, बि के दास एवं एल चक्रवर्ती।

भाकृअनुप–सिफरी द्वारा महिलाओं पर छोटी देशी मछलियों के सेवन पर परीक्षण कार्य

भाकृअनुप–सिफरी ने मदनगंज के नामखाना ब्लॉक के 30 महिलाओं के भोजन में छोटी मछलियों का सेवन पर एक परीक्षण कार्य, मदनगंज मछुआरा सहकारी समिति तथा आईसीडीएस केन्द्रों के सहयोग से किया है। इसके लिये 12 फरवरी 2017 को एक स्वास्थ्य शिविर लगाया गया जिससे महिलाओं में पोषण की कमी का आंकलन किया जा सके। इन महिलाओं के रक्त के नमूने यह बताते हैं कि लगभग 20 प्रतिशत महिलाओं में रक्त की कमी तथा 40 प्रतिशत महिलाओं में कैलशियम निर्धारित मात्रा से कम पाई गई। इन 30 महिलाओं को एक माह तक मदनगंज मछुआरा सहकारी समिति तथा आईसीडीएस केन्द्रों के सहयोग से छोटी मछली युक्त भोजन दिया गया। एक महीने के बाद फिर से 20 मार्च 2017 को इन महिलाओं के स्वास्थ्य में होने वाले परिवर्तन के आंकलन के लिये स्वास्थ्य शिविर लगाया गया। एक महीने के बाद यह देखा गया कि इनके रक्त में कैलिशयम और फॉस्फोरस का स्तर बढ़ गया है जिसका एकमात्र कारण था – इनके भोजन में छोटी देशी मछलियों का समावेश।

संस्थान ने इन छोटी मछलियों के संरक्षण के लिये मदनगंज जिले में 5 पोखरों को चुना है जिसमें अन्य प्रजातियों के साथ इनका भी पालन किया जायेगा। इस विषय में जागरूकता फैलाने के लिये पैम्फलेट एवं पोस्टर बांटे गये। इस परीक्षण कार्यक्रम को निदेशक के मार्गदर्शन में संस्थान के वैज्ञानिकों, डा0 अपर्णा रॉय, डा0 मो0 अफ्ताबुद्दीन एवं डा0 पी परीदा के द्वारा सम्पन्न किया गया। संस्थान के इस प्रयास को स्थानीय ग्रामवासियों ने बहुत ही सराहना की है।

अपर्णा रॉय, मो0 अफ्ताबुद्दीन, पी के परीदा, बि के दास, ए सिन्हा, अभिषेक घोष एवं सुप्रीति बायेन