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CIFRI NEWS
सिफरी समाचार

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भारतीय कृषि अनुसंधान परिषद

Agri search with a human touch

January - June, 2014:Volume - 19, No. - 1

22nd ICAR Regional Committee–II Meeting.. p - 3

Economic value of *P. monodon* by catch.. p - 5

National Conference on Wetlands.. p - 4


CERTIFICATE TÜV NORD

Management system as per
ISO 9001 : 2008

CENTRAL INLAND FISHERIES RESEARCH INSTITUTE
(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)
Barrackpore, Kolkata – 700 120,
West Bengal,
India

Basic, Strategic and Applied Research on Sustainable Fisheries Management in Inland Waters

IAF

CIFRI is now an ISO 9001:2008 certified Organization

The Institute Headquarters received ISO 9001:2008 certification (Certificate Registration No. QM 05 00293). The certification was awarded for application of quality management system in accordance with the standards for the scope of Basic, Strategic and Applied Research on Sustainable Fisheries Management in Inland Waters.

: Inside :

ICAR - CENTRAL INLAND FISHERIES RESEARCH INSTITUTE
Barrackpore, Kolkata - 700 120

Director's Column

It is a matter of pride that CIFRI has been certified as ISO 9001:2008 organization. This is in recognition of the institute's application of quality management system in accordance with the standards for the scope of 'Basic, Strategic and Applied Research on Sustainable Fisheries Management in Inland Waters'. Successful organization of the 22nd meeting of ICAR Regional Committee II during June 27-28, 2014 at the institute headquarter was another significant event during the last six months. A number of dignitaries including Ministers of Agriculture, Govt. of West Bengal and Govt. of Telangana, Secretary DARE and DG, ICAR, Secretaries of the State government departments of West Bengal, Odisha, Andhra Pradesh, Telangana and UT of Andaman and Nicobar Islands, DDGs of ICAR, Vice Chancellors of the State Agricultural Universities of this region and Directors/Heads of ICAR Research Institutes/Centres attended the meeting. Sixteen progressive farmers from this region were also felicitated on the occasion.

The Institute also organized the National Conference on Wetlands, in collaboration with South Asian Forum for Environment (SAFE). The conference, with a theme 'Mitigation and Adaptation Strategies in Wetlands : A Community Leadership Perspective' attempted to connect the community stakeholders, researchers and policy planners on conservation issues of wetlands and related climate concerns.

In the research front the institute accomplished a number of achievements. A study was carried out to estimate the environmental flows in Dri and Tangon rivers which is important to sustain the ecology and biodiversity of the rivers. Evaluation of the impact of fish stock supplementation on the food-web of Hemavathy reservoir was done. A comparative study on ecology and fisheries of stocked and un-stocked beels and impact of fisheries management practices on socio-economics of riparian population of beels in Assam was carried out. Species richness and spatio-temporal variation in assemblage structure of fish fauna in a non-perennial reservoir of Walayar was investigated. As a part of our efforts for identifying pollution biomarkers, transcript information on a suite of Hsps of riverine catfish *Rita rita* have been generated. Similarly the plasma proteome changes in *Labeo rohita* following arsenic-exposure were investigated. Experiment shows a clear metabolomic readjustment in amino acid level, which could possibly be a biochemical adaptation for survival in these lower verebrates. Many juveniles of shell and fin fishes are destroyed in the process of collection of post larvae of *P. monodon*, which pose serious ecological threats including breakage of the ecological chain, disruption of natural breeding processes and extinction of many indigenous fish species. We estimated the potential economic loss from destruction of juvenile fish by-catch. Land-use/land-cover change detection has been carried out using high resolution IRS – P6 LISS III satellite sensor data in Hooghly estuary. Heavy metal and pesticide pollution in Mahanadi river were investigated. An attempt was made to develop cost effective feed for reservoir cage fish farming using brewery waste as a protein source.

The institute has published 40 quality research papers, 10 technical bulletins and one training manual in this 6 months period. We also published the Hindi magazine 'Nilanjali'. As many as sixteen training programmes were organized for different stakeholders. CIFRI participated in 11 exhibitions across the country. Our staff members also received many awards/recognitions. Fifteen staff have been promoted to their next higher grade. We congratulate them and hope they will continue to work with same enthusiasm and energy to bring more laurels to the institute. During the last 6 months 8 staff including one SFAO have superannuated. We pray for their happy and healthy post retirement life. We also welcome 10 new ARS scientists who have joined CIFRI recently. Hope, they will infuse new ideas and new methods in the CIFRI research.

Mid-Term RAC, Mid-Term review meeting of Regional Committee II, Launching workshop of some of the new projects, Training-cum-workshop on 'Pen aquaculture in beels of Assam' and inception meeting of demonstration of cage culture technology in Himachal Pradesh were some of the other major meetings conducted at the institute. Similarly, Republic Day, National Science Day, Annual Sports Meet, CIFRI Foundation Day, International Women's Day, Sunderbans Day, Inauguration of the aquarium and multispeciality training complex by Dr. S. Ayyappan, Secretary, DARE & DG, ICAR were some of the important events celebrated/conducted at the institute.

I invite suggestions from the learned readers to enhance the quality of our Newsletter.

Barrackpore,
July, 2014

A. P. Sharma

22nd ICAR Regional Committee-II Meeting

Indian Council of Agricultural Research has set up eight Regional Committees across the country on the basis of agro-climatic regions to provide a forum to the researchers and the state government functionaries to prepare the roadmap for development of agriculture including animal husbandry, dairying, fisheries, natural resource management and human resource development for coming years.

The ICAR Regional Committee II comprises the states of West Bengal, Odisha, Andhra Pradesh, Telangana and UT of Andaman and Nicobar Islands. The 22nd meeting of this Regional Committee-II was held during June 27-28, 2014 at Central Inland Fisheries Research Institute, Barrackpore.

Honourable Minister-in-Charge of Agricultural Marketing and the Agriculture, Govt. of West Bengal, Shri Arup Roy inaugurated the meeting on 27th June, 2014. Sri Roy emphasized that West Bengal and the other states of this region have huge potential in agriculture and allied sectors which need to be harnessed with effective synchronization of research and development departments. He stressed that highest attention should be paid on the need of the farmers and location specific technological interventions should be made. He also mentioned about the seed mission programme started by the Government of West Bengal.

Dr. B. Meena Kumari, DDG (FS) & Nodal Officer ICAR RC-II, welcomed the delegates and highlighted the role of fisheries for livelihood improvement in this region. Dr. S. Ayappan, the Secretary, DARE and Director General, ICAR in his presidential address mentioned that the region offers tremendous scope and opportunities for multifaceted growth of agriculture sector, including animal husbandry, fisheries, horticulture, sericulture and various high value agricultural commodities like aromatic and designer rice, pulses, maize, oil-palm, short duration crops like ragi especially in dry situations, fish, poultry and livestock. Prof A P Sharma, Director, CIFRI and the Member Secretary, Regional Committee II presented the Action Taken Report of the action points framed in 21st Regional Committee Meeting held at Hyderabad during July 19-20, 2012.

On the second day, Hon'ble Minister of Agriculture of Telangana Sh. P Srinivas Reddy graced the meeting. He briefed the house about the potential of his state in the field of agriculture and allied areas. He pointed out the areas where ICAR and the state government can forge partnership. Directors/Heads of ICAR research institutes/Centres, Vice Chancellors of the State Agricultural Universities, Sr. Officials (Principal Secretaries/Secretaries/Directors) of the State Departments of Agriculture, Animal Husbandry, Dairy and Fisheries of this region participated in the meeting. In addition, special invitees like NABARD Kolkata, NAIP (ICAR), IGFRI Jhansi, PDFSR Modipuram, CIAE Bhopal also attended the meeting. Sixteen progressive farmers from this region were felicitated for their contribution and achievements in increasing agricultural production and productivity in the region.

National Conference on 'Mitigation and Adaptation Strategies in Wetlands: A Community Leadership Perspective'

The National Conference on Wetlands, organized by South Asian Forum for Environment (SAFE) and CIFRI under the aegis of Indian Council of Agricultural Research provided a platform to review advances in the ecological, bio-geochemical, and social sciences as they relate to wetlands, especially in the context of climate change. The conference, with a theme "Mitigation and Adaptation Strategies in Wetlands: Community Leadership Perspective" was organized during March 01-02, 2014. The conference tried to prescribe integrated solutions for sustainable management of wetland resources in a complex world, and to facilitate professional relationships at regional and national scales. The conference also delivered newer perspective on a wide range of socio-ecological and socioeconomic topics to help establish new collaborative partnerships towards change management. Dr. S. Ayyappan, Secretary, DARE & DG, ICAR, Dr. Sadamate, Former Adviser Agriculture, Planning Commission and Principal Consultant FAO, Presently, Agricultural Convergence Expert in World Bank Project, Dr. Vijayan, eminent ecologist and Chairman, Salim Ali Foundation, Dr. Dipayan Dey, Chair, South Asian Forum for Environment and Member UNEP were among the dignitaries present on the occasion. It was emerged that building public awareness about efficient use and benefits of wetlands and involvement of people are imperative requirements. The administration, state authorities and the civil society have significant roles to undertake. A need for formulation of national policy plan, exclusively for wetlands conservation was felt.

Research Highlights

Environmental flows for Dri and Tangon Rivers, Arunachal Pradesh

Rivers Dri (N 28° 39.428´; E 96° 01.554´) and Tangon (N 28° 39.661´; E 95° 51.023´) confluence to form Dibang river, a major left bank tributary of river Siang, which later flows southwest through Assam valley as the Brahmaputra. These rivers are of major concern for conservation of ecology and biodiversity in the light of a number of upcoming hydroelectric power projects that might impair the natural flow regime. A study was carried out to estimate the environmental flows required for sustaining the ecology and fish diversity on these rivers. Hydrological method by Flow duration curve, habitat simulation method by MIKE 11 model and wetted perimeter method were used in the study which assessed the situation in Dri and Tangon rivers as moderately modified from the pre-project stage. Here, natural hydrographs persist with reduced amplitude and duration of seasonal floods in many reaches of the river and in all tributaries. The critical need of flood pulses alternating with relatively shallow flow mimicking the natural hydrograph is being maintained as established by analysis of the daily flow scenario (Fig. A, B). During May-July and Aug-Sep flow in the order of 100 m^3/sec was estimated. In addition, a short spells of 4 to 5 days in September and October for ensuring healthy flood spills of the order of 250 m^3/sec in each rivers was estimated for return migration of the fish species and river geomorphology.

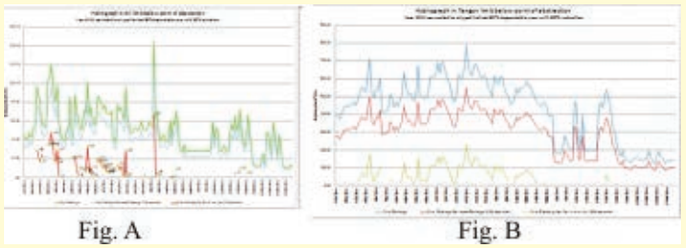


Fig. A Fig. B

Hydrograph of river Dri (A) and Tangon (B) (Natural flows of 90% dependable year)

A. K. Sahoo, Soma Das Sarkar, V. R.Suresh and A. P. Sharma

Collaborative demonstration of pen aquaculture in beels of Assam

The Institute demonstrated pen aquaculture technology in 34 beels of Assam in collaboration with the Assam Fisheries Development Corporation Ltd., Guwahati and Bodoland Territorial Council, Kokrajhar. In these beels, rectangular pens (size; 0.24-0.49 ha) were erected mostly in marginal areas of the beels using low-cost and locally available construction materials (split-bamboo screens and LDPE mosquito netting). The total cost of construction varied from Rs. 49,511to 87,211. Carp fry/fingerlings (25-100 mm length) were stocked at density of 2-7 nos./ m^2. The species of carp stocked were *Catla catla*, *Labeo rohita* and *Cirrhinus mrigala* at a ratio of 40:30:30. In some beels, common carp (*Cyprinus Carpio*) and

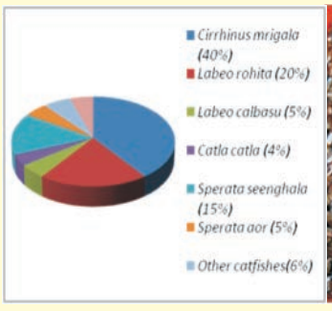
Pen aquaculture demonstration at Gangabunh beel, Kokrajhar District

grass carp (*Ctenopharyngodon idella*) were also stocked. The stocked fishes were fed with locally available rice bran-mustard oil cake mixture (1:1 ratio) @ 2-5% body weight. Fish production from the pens ranged between 3528.7 - 3655.28 kg/ha/3 months. Economic analysis of pen aquaculture showed that the technology was economically viable for carp fingerlings rearing with B: C ratio of 1.41-3.16.

B. K. Bhattacharjya, A. P. Sharma, A. Das, P. Das, K. K. Sarma, A. Kakati, S. N. Goswami and S. Yengkokpam

Fish assemblage and diversity in Panchet Reservoir, Jharkhand

Panchet is a large reservoir with an water spread area of 7,511 ha and catchment area of 10,961 km^2. The dam (23^0 41'04"N and 86^0 44' 56"E) has been built at the confluence of Barakar and Damodar Rivers. The commercial fishery in the reservoir was represented mainly by 11 families, 19 genera and 27 species.



Fish species spectrum recorded from Panchet reservoir

Juveniles caught by zero mesh net (Masari jal) at Panchet

Cyprinidae was the most diverse group (12 species), followed by Bagridae (3 species). Among the Cyprinidae, dominant species were *Cirrhinus mrigala* (40%) *Labeo rohita* (20%), *Labeo calbasu* (5%) and *Catla catla* (4%). Catfishes formed the second important fishery in which the dominant species were *Sperata seenghala* (15%) and *S. aor* (5%). The other catfishes (4%) recorded were *Ailia coila, Wallago attu, Mystus tengara* and *Ompok bimaculatus*. Miscellaneous fishes (7%) with minor contributions to fishery were *Gudusia chapra, Osteobrama cotio, Glossogobius giuris, Salmophasia bacaila, Pseudambassis ranga*. The CPUE ranged from 0. 256 kg/boat/day in October 2013 to 9.72 kg/ha/day during March, 2014 with an average of a meager 2.88 kg/boat/day. The productivity of the reservoir was observed to be very low (3.288 kg/ha/year). In spite of regular stocking of Indian Major Carps in the reservoir, the contribution of catla and rohu was very less, as compared to mrigal and one of the reasons may be the high fishing activity at surface and column in the reservoir.

D. Panda and Sandhya K. M.

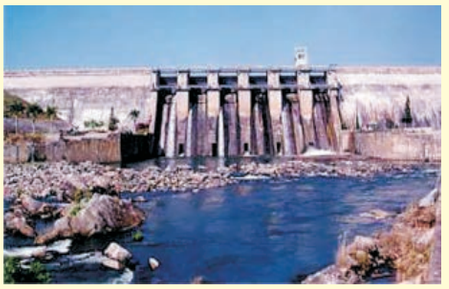
Economic value of *P. monodon* seed by-catch

Catching of shrimp post larvae significantly contributes to the livelihood of most of the fishers in Indian Sundarbans.

A survey of 54 households in Bakkhali and Gosaba regions of South 24 Parganas revealed that women play a major role in collection of post larvae, while children are engaged in sorting and further disposal of shrimp larvae. However, the activity of collecting shrimp post larvae, *P. monodon* for aquaculture destroys many other juvenile species of shell and fin fishes. The destruction of the by-catch juveniles pose serious ecological threats including breaking of the ecological chain, disrupting natural breeding processes and extinction of many indigenous fish species. The peak season for collecting shrimp post larvae is from March to June. Out of the destroyed species, 28 fish species were taken into account for estimating the economic value for which suitable methodology was developed. The methodology was based on the principle of economic loss of juveniles for not attaining maturity. The biomass of juveniles increases positively with their growth rates and negatively with mortality rates. The shrimp seed collectors who use the country boats for catching the shrimp seed were the samples for the study. The potential economic loss from destruction of juvenile fish by-catch was estimated to be Rs. 13.45 lakh per boat per year.

Anjana Ekka, Arun Pandit and Dipak Kr. Biswas

Impact of fish stock supplementation on the food-web of Hemavathy Reservoir



Hemavathy Reservoir

Hemavathy is an irrigation reservoir on the river Hemavathy at Gorur, Hassan district of Karnataka. The reservoir with an area of about 9162 ha is situated at 12° 4' N and 76°3'E at an elevation of 840 m above MSL. The comparative estimates of trophic status and energy flows were carried out to assess the impact of fish stocking on the fish resources. Mass-balanced models of reservoir ecosystem were constructed for two periods, 1982-83 and 2002-2003 using Ecopath software which showed the impacts on different groups before and after introduction of fishes, *Catla catla, Labeo rohita* and *Cirrhinus mrigala*. The models were structured around thirteen functional groups. The ecotrophic efficiencies (EE) of major carps and minor carps were higher in the pre-stocking phase compared to the post-stocking phase. Murrels and gobids had higher EE values in the post stock phase. The phytoplankton are heavily

exploited (EE > 0.80) in the system during the pre-stock phase. Mixed trophic impact (MTI) analyses indicate that phytoplankton and detritus had positive impact on most other groups. On the other hand, zooplankton had negative impact on phytoplankton, and catfishes had a negative impact on major carps. A decrease of the flows of the system from pre-stock to post-stock is evident (22.28%). The system overhead was higher by 0.29% in the post-stock phase indicating maturity. Detritus accumulation decreased by 4.5% in post-stock phase. The ecosystem indices tested indicate that the reservoir during post-stock phase was in a more resilient state compared to the pre-stock phase. The 'health' of the ecosystem showed an improvement which indicates a positive impact of stocking. The successful development of such ecosystem models will provide powerful tools to evaluate the impact of human and environmental factors on reservoir ecosystems.

Feroz Khan and Preetha Panikkar

Ecology and fisheries of stocked and un-stocked beels in Morigaon District, Assam

Damal *beel*

A field study was carried out to assess the ecology and fisheries of one stocked (Damal) and one un-stocked (Sukdol-Sarubori) seasonally open beels of Morigaon district, Assam. Damal beel (18 ha) is stocked with carp seed for enhancing its fish production, whereas Sukdol-Sarubori beel (17.05 ha) is managed under capture fisheries norms (un-stocked beel). During the pre-monsoon season (March-May), water-spread area and depth of Sukdol-Sarubori beel (0.6 to 0.91 m) was considerably reduced due to negligible pre-monsoon rains in the region. Reduced water depth coupled with intensive fishing during March apparently resulted in slight deterioration of water quality (increase in free CO_2 and decrease in DO concentrations) in this shallow beel. Similar trend was also observed in Damal beel during the pre-monsoon season. Macrophyte infestation was moderate in both the beels (20% in Damal beel and 30% in Sukdol-Sarubori beel), the major component of which being that of submerged/ emergent one. Bacillariophyceae dominated plankton and periphyton population in both the beels (77% in Damal and 61.5% in Sukdol-Sarubori beel). Higher benthos population was observed in Sukdol-Sarubori beel (84 Nos./ sq. m) whereas it was moderate in Damal beel (20 Nos./ sq. m). In the stocked beel (Damal), the major contribution of fisheries came from stocked fishes (70-75%), consisting mainly of Indian major and exotic carps (grass and common carp). In contrast, *Puntius* spp. (30%) and other Cypriniformes contributed 63% of the total fish catch in the un-stocked beel (Sukdol-Sarubori). IMCs and exotic carps contributed only 11% of the total catch in this beel. Both the beels recorded moderate fish yield rates estimated at 810 kg/ ha/ yr for Damal and 800 kg/ ha/ yr for Sukdol-Sarubori beel.

P. Das, B. K. Bhattacharjya, S. Yengkokpam, A. K. Yadav, K. K. Sarma and A. Kakati

Impact of fisheries management practices on socio-economics of riparian population

Sukdol-Sarubari *beel*

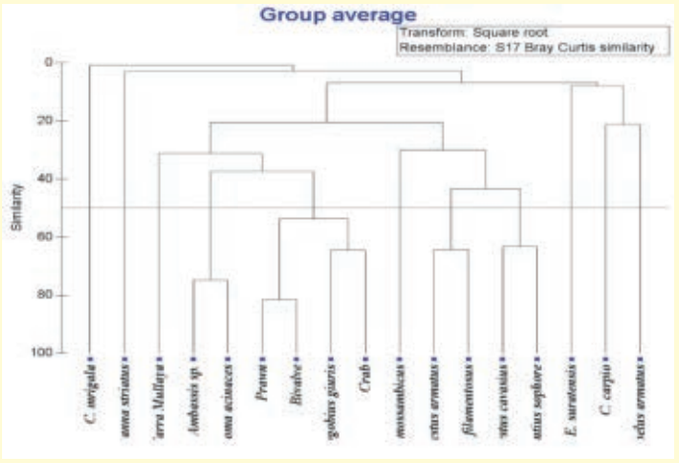
The study was conducted in three beels, viz. Sukdol-Sarubari, Udari and Barmanoha of Morigaon district, Assam. The selected beels represented three management situations viz. (i) shallow un-stocked (Sukdol-Sarubari), (ii) shallow stocked (Udari) and (iii) deep stocked (Barmanoha). It was found that 2 persons/family engaged themselves in fishing in case of the deep stocked beel (Barmanoha), one each worked as fishers in shallow stocked (Udari) and shallow un-stocked (Sukdol-Sarubari) beels. Intermediate assets of the fishers consisted of crafts, gear and livestock. In case of the fishers of Barmanoha beel, fishing crafts constituted 14.79% of the intermediate assets and gear to the tune of 51.13% of total value of current assets. The highest percentage of income from fishery (41.67% of total annual income) was obtained by the fishers of Sukdol-Sarubari followed by that of Barmanoha (39.39%) and Udari (22.04%). Impact of management on fishery livelihood showed an increase of 47% income in shallow un-stocked beel over shallow stocked beel and 5% increase over deep stocked beel. Predictably, shallow stocked beel showed a decline of 78% income over deep stocked beel. The highest annual employment from fishery by a single fisherman (102 man days) was generated by the fishers of Sukdol- Sarubari, followed by that of Barmanoha (88 man days) and Udari (84 man days).

S. N. Goswami, B. K. Bhattacharjya, K. K. Sarma, A. Kakati and A. Das

Species richness and spatio-temporal variation in assemblage structure of fish fauna in a non-perennial reservoir, Walayar, Kerala

Walayar (259 ha) is a small, seasonal reservoir in Kerala and Tamilnadu border, fed by both south-west and north-east monsoon moderately. The Carlsson trophic state index (TSI) for Seechi disc (54.15) and chlorophyll a (60.68) indicates the reservoir is eutrophic. A wide variation in abundance and distribution of fish fauna is observed spatio-temporally. A total of 17 species of fishes were identified and grouped as indigenous fishes, exotic fishes, molluscs (excluding *G.giuris*),air breathing fish, stocked fishes and trash fishes. It is interesting to note that *Oreochromis mossambicus*, an exotic fish clustered with native fishes showing its strong foothold in this reservoir, as observed in many peninsular reservoirs.

The fish species diversity of this reservoir was assessed through count based measures, such as Species richness(S), Shannon diversity index (H'), Pielou's evenness index (J') and Margalef's index (d) and Simpson's dominance index (1-λ). The species richness (13), Margalefindex (2.86), Evenness index (0.9975), Shannon index (2.16) and dominance (0.84) were high in the lotic zone during January. This is followed by intermediate and lentic zone. However the number of individuals(N) is high in lentic zone during February, the beginning of dry season and water



Dendrogram for hierarchial clustering of fish assemblages

isstill. However reduced species diversity in lentic zone where disturbance or stress to fishes minimal is observed probably due to competitive exclusion between species. The present study showed the structure of fish assemblages and their diversity pattern and may be useful for conservation and sustainable management of reservoir fisheries.

Rani Palanisamy and S. Manoharan

Plasma proteome changes following arsenic-exposure

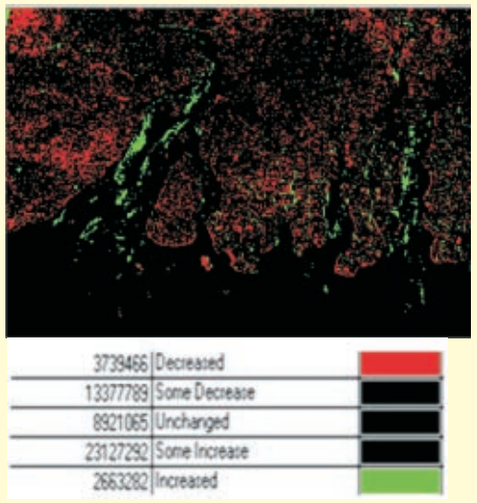
The plasma proteome changes in *Labeo rohita* following arsenic-exposure were investigated. Using gel-based proteomic techniques like 2-D GE, MALDI-TOF-MS and LC-MS/MS, the plasma proteins undergoing changes in expression following experimental arsenic exposure were identified. The unique proteins identified are Apolipoprotein-A1 (Apo-A1), α-2 macroglobulin-like protein (A2ML), transferrin and warm-temperature acclimation related 65kDa protein (Wap65). Up regulation of these liver-specific proteins indicated liver damage following arsenic exposure at higher concentrations. Combination of these novel biomarkers could be utilized as biomarkers of hepatotoxicity and chronic liver disease.

Arsenic has a generalized immunosuppressive effect in the IMC *Labeo rohita*. The impact of arsenic exposure, the potent environmental contaminant, on the expression of selected immune genes (IL-1β, IFNγ, IL-4, IL-10) and hsp genes (hsp 47, 60, 70, 71, 78 and 90) in the carp *Labeo rohita* was investigated. Expression of some of the Hsp proteins (Hsp70 and 90) were also analyzed by immunoblotting. It was found that all hsp genes showed up regulation in liver, indicating arsenic-induced stress.

B P Mohanty

Land use - Land cover changes analysis using remote sensing

Land-use/land-cover change detection is a one of the most fundamental and common uses of remote sensing image analysis. This analysis has been carried out using high resolution IRS – P6 LISS III satellite sensor data (path/row – 108/56 & 108/57) of 11-Feb-2004 and 24-Jan-2012. Hooghly estuary area is approximately 147 x 147 sq. km and lies between latitude 20°41'55.36"N to 22°16'25.19"N and longitude 87°16'32.32"E to 89°0'41.38"E. The image of 2012 was subtracted with 2004 image using digital image-processing software ERDAS Imagine (v. 9.3). The preliminary results indicate that 12.35% of total study area has been changed completely, 70.43 % of area was slightly changed and only 17.2% remained unchanged out of entire study area. This change included land use pattern in the catchment area and estuarine sedimentation. A "highlight" image was created, marking pixels that have increased or decreased in the figure. Study also revealed that Island loss occurred due to coastal erosion during 2004 - 2012.

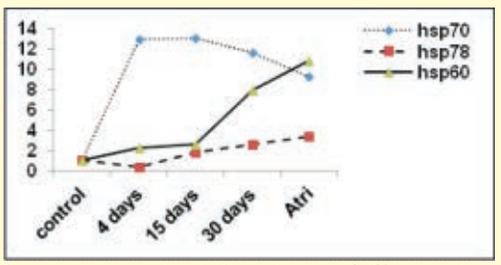


The four islands Gharamara, Nayachar, Gangasagar and Jambu situated in Hoogly sea mouth, lost its area of 13.63%, 5.88%, 2.94% and 28.31% respectively during 2004 to 2012.

S K Sahu and D Karunakaran

hsp gene expression analysis to understand upper thermal acclimation in the lower vertebrates

Investigations were carried out to study the hsp gene expression profiles in the murrel *Channa striatus* collected from a hot spring runoff and compared the findings with that of *Channa striatus* experimentally exposed to high temperature (36°C) for varying durations (4, 15 and 30 days) for understanding the long term adaptation mechanism of higher organisms to thermal stress. The findings suggest that Hsp60, Hsp70 and Hsp78 are involved in long term survival of the organism at high temperature and appear to be the key players in thermal acclimation response.



hsp gene expression in liver tissues of *Channa striatus* in response to temperature stress.

B P Mohanty

Heavy metal and pesticide pollution status of Mahanadi River

A detailed investigation in river Mahanadi showed that the water of the river was free from pollution of heavy metals viz., Cd, Cu, Mn, Pb, and Zn; only Mn was detected in trace levels in some occasions. In sediment phase, Cd and Pb were not detected, Zinc was detected at the levels below its pollution levels of 90 ppm, Copper was detected in 50% of the study sites to cross the mild

pollution level of 25 ppm in some occasions.

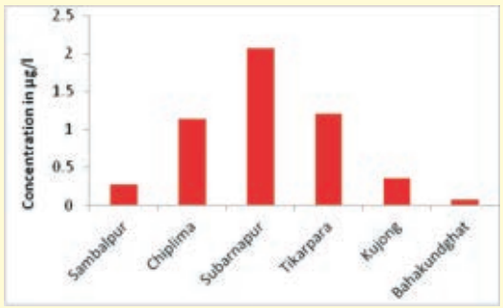
Only Zn was recorded in fish flesh. In samples from Zero point, Hirakud Zn level was 0.0-10.3 ppm in *Cirrhinus reba*, 14.9-16.9 ppm in *Labeo calbasu*, 0.0-8.5 ppm in *Silonia silondia*, and traces in *Sperata aor*; 0.0 – 5.7 ppm in *Rita chrysea* at Chiplima; 2.5 - 4.3 ppm in *L. calbasu*, 15.3 – 16.0 ppm in *Salmophasia bacaila* at Sonepur; 9.2 ppm in *Johnius coitor*, 5.4 ppm in *L. Calbasu*, 4.6 ppm in *S. Silondia* and traces in *Walago attu* at Zobra. As a whole, fish fleshes were safe for human consumption.

Analysis of water in GC-ECD for organochlorinated pesticide (OCP) residues revealed that about 33% samples were contaminated with residue of one or more OCPs, albeit in very minute concentrations. Among the HCH isomers (α, β, and γ, δ), α-HCH in one and δ-HCH in three samples were recorded with total HCH concentration in positive samples ranging between 0.283 and 2.05 µg/l. DDT isomers and metabolites were detected in three samples in concentration varying from 0.021 – 0.07 µg/l. Endosulfan sulfate was detected in one sample, while α and β-endosulfan could not be detected in any of them. Heptachlor was also recorded in two samples.

Residues of OCPs were recorded in 22.22% of fish samples. Flesh of *W. attu*, *M. seenghala* and *G. gobis* from Zero point and Zobra was found to contain pp DDE at concentration of 0.004, 0.02 and 0.22 µg/g respectively. Flesh of *M. seenghala* was also found to becontaminated with β-HCH (0.006), γ-HCH (0.005) and op DDE (0.04). The concentrations of different OCPs found in fish samples were much below the MRL (maximum residue level) prescribed by Govt. of India or other agencies.

S. Samanta, S K Nag, K Saha, S Bandyopadhyay and A Ghosh

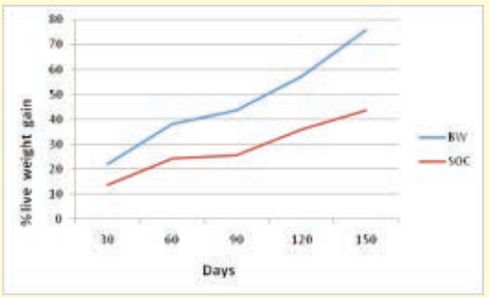
Cost effective feed for reservoir cage fish farming using brewery waste as protein source



Load of Organochlorine pesticide residues in Mahanadi water

The demand of soybean meal as protein source for poultry and cattle farming coupled with increased awareness and consumption by human being has led to soaring price of this commodity in the country. To reduce dependency on soybean oil cake, an attempt was made to search for alternate protein source for use in fish feed. Brewery waste was identified as a cost effective alternative to soybean meal because of its high (49.2%) protein content. The wet sample was collected from a brewing industry in Kolkata for its nutritional quality which compares well with soybean oilcake. Using brewery waste as principal source of protein, a dietary composition was formulated (29.02% CP) to prepare floating feed using recently procured extruder pellet mill. The formulation was successful in preparing floating pellet. The pellet was tested for its physical stability and floatation time in both indoor and outdoor environment before testing its growth efficiency. In outdoor testing at Maithon reservoir revealed its floatation capability of 96 % for 3 hours and 68% for 24 hours. The pellet was found stable with little swelling in size after 8 hours of floatation and found physically intact for 18-24 hours.

The performance of feed was tested in minor carp *Labeo bata* fingerlings in cages installed in Maithon reservoir. It was found that the growth was poor during winter months when water temperature was in the range of 19-24°C. With the improvement of water temperature better performance of feed was noticed in terms of percent live weight gain. The feed formulated with the brewery waste indicated better performance (75.8 % live weight gain) throughout the experimental period.

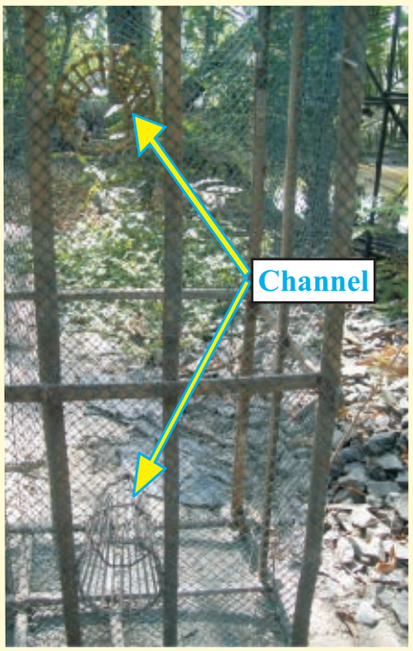


Growth performance of *L. bata* fed extruded pellet

Md Aftabuddin, M A Hassan and D K Meena

Farmers' innovation in fishing trap

In Sunderban area, a rectangular shaped fishing trap locally named as *chokhia* is used in the water channels to catch the fishes like Tangra (*Mystus vittatus*), Gule (*P. lanceolatus*), prawns etc. Now-a-days fishers use nylon nets instead of bamboo split which is of low cost and more durable. Some fishers of Fraserganj area of Sunderban who earn their livelihood by capturing small fishes from water channels / creeks has modified *Chokhia*, by adding eight small channels in the trap made by bamboo. As a result of this modification the efficiency of the trap has increased and they are getting 30% more catch of Tangra (*Mystus vittatus*) and Gule (*P. lanceolatus*).



A Roy

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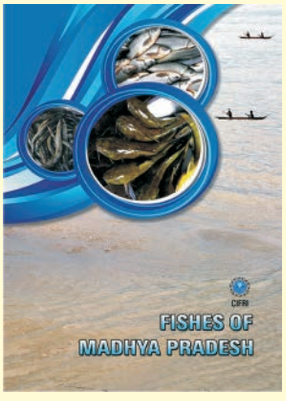
Special publications

Bulletin: Fishes of Madhya Pradesh

Authors: A K Das, A P Sharma, B C Jha and B K Biswas

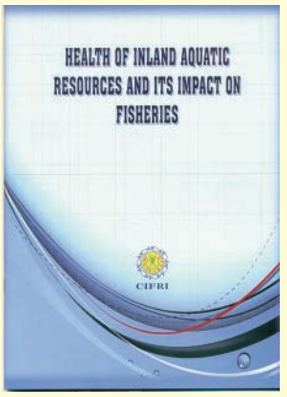


Madhya Pradesh is blessed with vast aquatic resources and rich fish diversity which is a major source of livelihood for millions. However there is paucity of information with regard to current knowledge on fish diversity of central India. Based on the diversity studies conducted in inland water bodies of Madhya Pradesh, this bulletin has been prepared. The bulletin contains the taxonomic identification of fishes available in Madhya Pradesh for quick identification guide for students, teachers and aquaculturists.

Policy Paper : Health of inland aquatic resources and its impact on fisheries

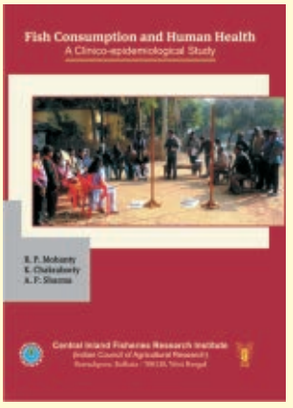
Authors: A P Sharma, M K Das and S Samanta

The CIFRI Policy document No. 4 describes the heterogeneity and opulent productive potential of inland fisheries resources of the country which provide livelihood for 14 million people engaged in fishing, aquaculture and ancillary activities. The production potential from these diverse resources is greatly dependent on their ecosystem health. In this policy paper the habitat status of the Indian major rivers, reservoirs and floodplain wetlands has been reviewed in detail. The major contributors for habitat deterioration including metal and pesticide contaminations have been dealt. The impact of alterations in water quality parameters, hydrological variations, changes in land use pattern, issues related to climate change and invasion of exotic fish species have also been described. The policy framework, legal framework and Institutional framework governing inland water management in India have been dealt with. To protect our inland open water resources and maintain at a level which will yield in a sustainable manner, the strategies to be adopted for rational water management have been outlined.



Bulletin : Fish consumption and human health : A clinico epidemiological study

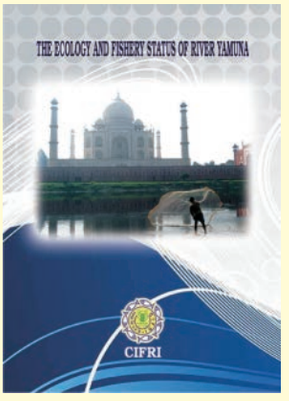
Authors: B P Mohanty, K Chakraborty and A P Sharma



This bulletin is a product of ICAR Outreach Activity #3 Consortium : Nutrient profiling and evaluation of fish as a dietary component. Medical and therapeutic value of fish are well known and are being harnessed for preventing a wide range of human aliments. During the last few decades extensive efforts are made for scientifically establishing the health benefits of eating fish through clinic-epidemiological surveys and human feeding trials. This bulletin has documented valuable information on health benefits of fishes based on clinic-epidemiological surveys and human feeding trials.

Bulletin : The ecology and fishery status of river Yamuna

Authors: A P Sharma, M K Das, S Samanta, S K Paul and S Bhowmick



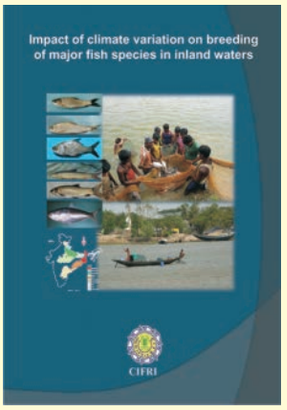
The river Yamuna is the largest tributary of river Ganga. The river revered for ages by millions of people as it flows alongside the historical cities of Delhi, Vrindavan, Mathura and Agra. The river supports a rich diversity of fishes of commercial value. However over the years anthropogenic pressures and other factors impacted the fisheries of the river. The present document is a record of studies conducted in 1200 km stretch from Dak Pathar to Allahabad. A comprehensive and effective management plan has been presented in the bulletin.

Bulletin : Impact of climate variation on breeding of major fish species in inland water

Authors: A P Sharma, Malay Naskar, K D Joshi, B K Bhattachryya, S K Sahu, S Das, D Sudheesan, P K Srivastava and A Rej

Based on the structurally-designed questionaire, survey of fish

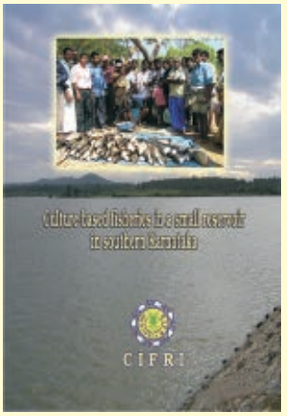
hatcheries were conducted in the the states of Assam, West Bengal, Odisha, Bihar, Andhra Pradesh, Madhya Pradesh and Uttar Pradesh. Various parameters viz., onset of breeding, ownership category, period of breeding, climate parameters, etc. are presented in the GIS platform to develop E-Atlas. Impact of climatic variations on the breeding behaviour of Mahseer, snow trout, rainbow trout and Indian major carps were assessed in the states of Uttarakhand and Himachal Pradesh. Breeding, maturity and spawning pattern of Indian shad and mullet in relation to climatic variation was studied in Hooghly-Bhagirathi river stretch. Various adaptive strategies to mitigate the impact of change in climate in inland fisheries have been included in the bulletin.



Bulletin : Culture-based fisheries in a small reservoir in Southern Karnataka

Authors: D S Krishna Rao, Karthikeyan, M E Vijaykumar and S K Sadhukhan

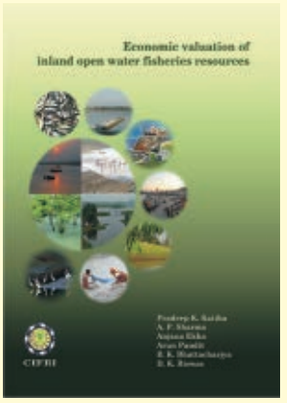
This technical bulletin describes a success story in culture based fisheries in Suvarnavathy, a small reservoir in South Karnataka. Success was achieved because of fruitful cooperation among Karnataka Cooperative Fisheries federation, Mysore, Department of Fisheries, Karnataka, the Tribal Fishers' Society and Central Inland Fisheries Research Institute. The study proves the validity of the technology, developed by CIFRI, for the management of small reservoirs in different agro-climatic zones.



Bulletin : Economic valuation of inland open water fisheries resources

Authors: P K Katiha, A P Sharma, Anjana Ekka, Arun Pandit, B K Bhattacharjya and D K Biswas

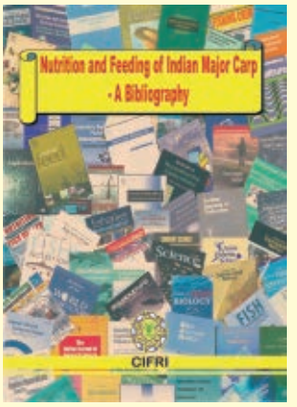
The present bulletin is an attempt to present an overview of CIFRI experiences in valuation of inland open waters including three floodplain wetlands, one each of reservoir, river stretch and estuarine zone. The bulletin covered major direct, indirect and non use values of typical inland open water ecosystem; the assessment framework for economic valuation including the process, types of value and their estimation techniques and sources of inefficiencies like market and policy failures in aquatic eco-systems.



Bulletin : Nutrition and feeding of Indian Major Carp - A bibliography

Authors: M A Hassan, Md Aftabuddin and A P Sharma

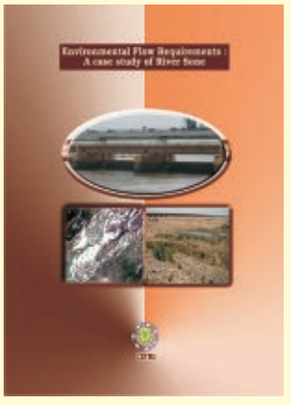
Scientific culture of Indian major carp both in land based aqua-farm and enclosure farming in the sub-continent is of recent origin, compared to salmon, American catfish, eel, perch and yellow tail. In order to make the knowledge and information on Indian major carp more useful and easily accessible, the present effort was therefore directed towards gathering the information available in the public domain and compiled them in the form of a bibliography. The bulletin highlighted on various aspects of nutrition and feeding strategies of Indian major carps including nutritional (protein, amino acid, lipid, fatty acid, carbohydrate, mineral, vitamin) requirement and efficacy of feedstuff, feed additives and feeding practices on health and nutrition.



Bulletin : Environmental flow requirements: A case study of river Sone

Authors: Dharm Nath Jha, A Alam and K D Joshi

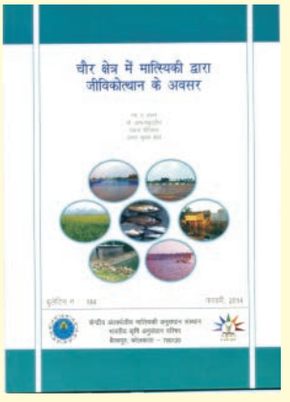
The issues of environmental flow assessment and management assumed importance in recent times. In Indian context, this is the first attempt to categorically estimate environmental flow requirements of a river downstream to a commissioned barrage. It's a preliminary study done using hydrological data with the help of Global Environmental Flow Calculator, software developed for desktop rapid assessment of Environmental Flows (EFs). The river Sone a tributary of the river Ganga is an example of river modifications by construction of dams and barrages for electricity generation and irrigation purposes. In the bulletin, the flow regimes of the river were estimated by using 36 years discharge data on the software. To maintain the river in moderate condition and to keep basic ecosystem functions intact at least 18.9% of Mean Annual Runoff (MAR) has been estimated, while the actual discharge of the river was occasionally reduced to mere 5.2 % of MAR. As a result, the river below the barrage has almost lost its riverine character and reduced to pools and pockets. Though the river presently holds 89 fish species but 20 species reported in an earlier study were not observed, while 13 new fish species were encountered for the first time during the study period.



Bulletin : चौर क्षेत्र में मात्स्यिकी द्वारा जीविकोत्थान के अवसर

Authors: MA Hassan, Md Aftabuddin, Pankaj Patial, A K Bose

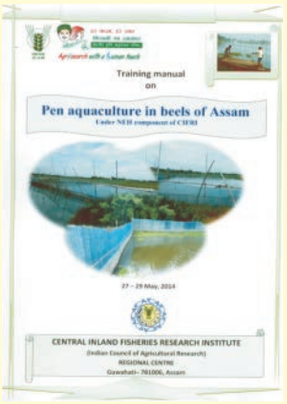
In spite of having vast areas of floodplain wetlands resources and their production potential, the state of Bihar has 48% deficit in fish production. The bulletin highlighted the impact of the various ground level fisheries technological and social intervention for developing selected chaur fisheries in Bihar which could both increase chaur fish production and provide better



livelihood options. This bulletin emanated from a case study in Bihar conducted under the National Agricultural Improvement Projects component - III which contains both the fisheries enhancement related knowledge and skills for managing the chaur resources that are facing severe water scarcity, suffering from proper community participation and technological intervention

Training manual on pen culture in beels of Assam

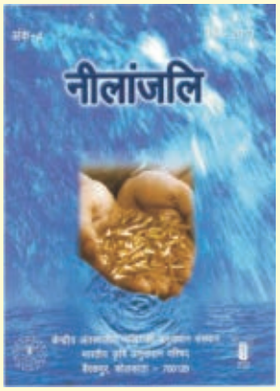
This Training manual of 105 pages has been compiled and edited by P Das, S Yenkokpam, AK Yadav and BK Bhattacharjya. The Manual contains lecture delivered during the training-cum-workshop programme on 'Pen aquaculture in beels of Assam' organized by CIFRI Regional Centre, Guwahati during 27-29 May, 2014for fisheries officials under Directorate of Fisheries, Govt. of Assam. The bulletin deals with different aspects of pen culture including suitable sites for pen culture, the fabrication, installation of pens and its management.



Nilanjali

Editors: NP Sreeevastava, S Samanta, Md Kasim and Sunita prased

''गणेश शंकर विद्यार्थी हिन्दी कृषि पत्रिका'' के प्रथम पुरस्कार (वर्ष 2010 के लिये) से सम्मानित संस्थान की वार्षिक गृह पत्रिका 'नीलांजलि' के अंक–4 का प्रकाशन वर्ष 2013 में किया गया। इस पत्रिका में संस्थान में राजभाषा हिन्दी के प्रचार–प्रसार व कार्यान्वयन संबंधी जानकारी और संस्थान की महत्वपूर्ण झलकियों के साथ विविध विषयों पर आधारित रचनाओं को सम्मिलित किया गया है। इन विविध रचनाओं में कई ज्वलंत विषय जैसे, तिब्बत पर फैलता पर्यावरणीय संकट, प्रदूषण, जलवायु परिवर्तन एवं भूमण्डलीय उष्मीकरण और मात्स्यिकी अनुसंधान के साथ–साथ वर्तमान समस्याओं पर आधारित कवितायें इस पत्रिका को और भी उद्देश्यपरक एवं रचनात्मक बनाती हैं। पत्रिका के इस अंक की व्यापक स्तर पर बहुत सराहना हुई है और कई सराहना पत्र प्राप्त हुये हैं।



Mass Awarness Programme

A mass awareness programme on Reservoir Fisheries Management was organized at Suvarnavathy reservoir, South Karnataka on February 08 2014.

Foreign Visit

- Prof A. P. Sharma, Director, visited Dhaka, Bangladesh to attended the first meeting of the Joint Working Group (JWG) on "Cooperation in the field of fisheries" between India and Bangladesh during March 12 - 13, 2014.
- Dr. Dipesh Debnath, Scientist, returned from Ghent University, Belgium after attending the DBT Overseas Associateship for NE Scientists for the period of May 23, 2013 to May 24, 2014.

Awards/Recognitions

- M. Feroz Khan, Preetha Panikkar, A. P. Sharma got special Award (VisheshPuraskar) for the paper on "Technologies developed for sustainable fish production from Reservoirs at Indian Institute of Horticultural Research, Bangalore, during June 04-05, 2014 at Bangalore.
- B. K. Bhattacharjya was recognized as Member, Expert Committee on fish biodiversity of Assam State Biodiversity Board, Guwahati.
- Exhibition Stall of Allahabad Regional Centre received 2nd prize in *Rastriya Kisan Mela evam Sabji Pradarshani* held at Indian Institute of Vegetable Research, Varanasi on 1st February 2014.
- Lawn of Allahabad Regional Centre got Second Prize among the lawns of government offices in Allahabad in *Mandaliya Phal Shak -Bhaji Evam Pushp Pradarshani* held at Chandra Shekhar Azad Park, Allahabad. The award was presented in prize distribution ceremony held at the Park on 9th March 2014.

Trainings

Sl. No.	Training course title	Period	Participants	Venue
1.	Fishery enhancement in inland open waters.	January 03-07, 2014	10 AFO/FI of Department of Fisheries (Govt. of Chhattisgarh)	CIFRI, Barrackpore
2.	Inland fisheries production and resource management	January 17-23, 2014	30 fishers of Siwan District,Bihar	CIFRI, Barrackpore
3.	Ecology and fisheries assessment of Chilika lake	January 30 to February 08, 2014	Seven postgraduate beneficiaries of Chilika Development Authority, Bhubaneswar and CIFRI	CIFRI, Barrackpore
4.	Inland fisheries production and resource management	February 06-12, 2014	26 fishers of Gopal ganj District,Bihar	CIFRI, Barrackpore
5.	Inland fisheries production and resource management	February 14-20, 2014	30 fishers of Begusarai District, Bihar	CIFRI, Barrackpore
6.	Koha sotware for integrated Library Management	February 17-19, 2014	Fifteen library personnel from NIRJAFT, Kolkata; OUAT, Bhubaneshwar; CIFA, Bhubaneshwar and BCKV; CIFE, Kolkata Centre and CIFA, Rahara Centre	CIFRI, Barrackpore
7.	Inland fisheries production and resource management	February 22-28, 2014	30 fishers of Lakhisarai District , Bihar	CIFRI, Barrackpore
8.	Introduction to analysis of community ecology data by using R and CANOCO	February 25-27, 2014	CIFRI Scientists	CIFRI, Barrackpore
9.	Inland fisheries production and resource management	February 28-March 3, 2014	29 fishers of Saharsha District, Bihar	CIFRI, Barrackpore
10.	Inland fisheries production and resource management.	March 04-10, 2014	27 fishers of Khagaria District ,Bihar	CIFRI, Barrackpore
11.	Fisheries data collection and value chain assessment	March 13-14, 2014	13 CDA Personnel and five officials from Department of Fisheries, Orissa	WRTC, Barkul.
12.	Pen aquaculture in beels of Assam	May 27-29, 2014	13 fisheries officials/ contractual technical assistants of the Directorate of Fisheries, Assam	CIFRI, Guwahati
13.	Inland fisheries production and resource management	March 21-27, 2014	30 fishers of Nawada District, Bihar	CIFRI, Barrackpore
14.	Mixed farming of carps and small indigenous fishes in watersheds of Sunderbans	April 28-30, 2014	30 fisher women	Namkhana,24Pargans During
15.	Canal fisheries development	May 01-03, 2014	30 fishermen	KVK, Budbud, Burdwan
16.	Reservation roster	March 29, 2014	4 administrative officials of CIFRI including A.O., AAOs	CIFRI, Barrackpore





Exhibitions

Name of programme	Venue	Period	Participated by
1st Assam Agri -Horticultural International show 2014	Khanapara, Guwahati	January 11-14, 2014	CIFRI, Guwahati Regional Centre
Sanhati Utsav -2014	Hazinagar 24 -Pgs(N), W.B.	January 12-19, 2014	CIFRI, Barrackpore
Technology Celebration Week – 2014	KVK,Kapgari, Pachim Medinipur, W.B.	January 21-25, 2014	CIFRI, Barrackpore
Sundarban *Garmin Kutir Shilpo - O - Loko Sanskriti Utsav* - 2014	Joygopalpur, 24Pgs(S), W.B.	January 22-28, 2014	CIFRI, Barrackpore
Rastriya Kisan Mela evam Sabji Pradarshani	Indian Institute of Vegetable Research, Varanasi	February 01, 2014	CIFRI, Allahabad Regional Centre
Exhibition on the occasion of consultation workshop organised by CIFA, Bhubaneswar	Agartala	February 05, 2014	CIFRI, Guwahati Regional Centre
"Krishi Vasant" – National Agriculture Exhibition	Nagpur, Maharastra	February 09 -13, 2014	CIFRI, Barrackpore
Kishan Mela - cum - Exhibition organised by CPCRI Regional Centre, Kahikuchi, Guwahati	CPCRI Regional Centre, Kahikuchi, Guwahati	February 21, 2014	CIFRI, Guwahati Regional Centre
Assam *Matsya Mahotsav*	Panjabari, Guwahati, Assam	February 26-27, 2014	CIFRI, Guwahati Regional Centre
Pusa *Krishi Vigyan Mela*	IARI, New Delhi	February 26-28, 2014	CIFRI, Allahabad Regional Centre
Exhibition of Technology Celebration Week - 2014	North 24 -Parganas KVK, Ashoknagar, W.B.	March 10-15, 2014	CIFRI, Barrackpore

Superannuation

Name & Designation	Last place of posting	Date of superannuation
Shri Munnilal Mallah, SSS	CIFRI, Allahabad	31.01.2014
Shri Ram Pada Halder, SSS	CIFRI, Barrackpore	28.02.2014
Shri N. Subramani, SSS	CIFRI, Bangalore	31.03.2014
Shri K. Manjhi, A.A.O.	CIFRI, Barrackpore	30.04.2014
Shri R. Palanisamy, SSS	CIFRI, Kochi Centre	30.04.2014
Shri K.P. Nath, SF&AO	CIFRI, Barrackpore	31.05.2014
Shri B. Gharami, SSS	CIFRI, Barrackpore	31.05.2014
Shri H.P. Bhanja, SSS	CIFRI, Barrackpore	30.06.2014

Promotions

Name &Designation	Promoted to	With effect from
Shri. S. Manoharan, Sr. Technical officer	Asst. Chief Technical Officer	04.06.2008
Ms. Keya Saha, Sr. Technical officer	Asst. Chief Technical Officer	01.01.2010
Shri Soumitra Roy, Technical Officer	Senior Technical Officer	31.01.2010
Shri James Murmu, Technical Officer	Sr. Technical Officer	29.06.2011
Ms. Sunita Prasad, Technical Officer	Sr. Technical Officer	04.10.2011
Shri Sukumar Saha, Asst. Chief Technical Officer	Chief Technical Officer	03.02.2012
Shri N. K. Saha, Sr. Technical Assistant	Technical Officer	01.07.2012
Arijit Ghosh, Sr. Technician	Technical Assistant	02.01.2013
Shri J. K. Singh, Sr. Technician	Technical Assistant	15.01.2013
Shri Rabiul Sk. Sr. Technician	Technical Assistant	12.06.2013
Shri Sanjay Das, Sr. Technician	Technical Assistant	11.09.2013
Shri Chandan Chakraborty, Sr. Clerk	Assistant	10.02.2014
Shri G. C. Barman, Sr. Clerk	Assistant	10.02.2014
Shri K. Shaw, Sr. Clerk	Assistant	10.02.2014
Shri A. C. Biswas, Sr. Clerk	Assistant	10.02.2014

Transfer

Name &Designation	From	To
Shri Lokenath Chakraborty, Senior Technical Assistant	CRIJAF, Barrackpore	CIFRI, Barrackpore

New Appointments

CIFRI family welcomes the ARS scientists who joined the institute in April 2014


Shri Vikash Kumar


Ms. Suvra Roy


Shri Manas H.M.


Ms. Tanuja Abdulla


Ms. Gunjan Karnatak


Shri Raju Baitha


Shri Lianthuamluaia


Ms. Kavita Kumari


Shri Mishal P.


Ms. Ramya V. L.

Meetings

Mid-Term RAC

The mid-term RAC meeting was held at CIFRI, Barrackpore during January 09-10, 2014. The meeting was chaired by Prof. Brij Gopal, Chairman of RAC. The other members Dr. V. V. Sugunan, Dr. C. Vasudevappa; Dr. N. Sarangi; Dr. S. D. Singh were also present. All HoDs, PIs, Regional Heads, and scientists from the headquarters attended the meeting. Importance was given on preparation and presentation of log frame of the divisions/programme/project. It was suggested by RAC that log frames need to be updated in the light of the recent developments in the relevant fields. It was further suggested that the projects should be linked with the 'interventions' and 'outputs' listed in the log frame so that gaps can be easily identified. It was recommended by RAC that CIFRI's flagship programmes should include e-flows, valuation of resources, development of policy advices for establishing suitable governance regimes for sustainable management of aquatic resources, sustainable management of floodplain wetlands and reservoir, fish passes, ecosystem approach and responsible fisheries.

Mid term review meeting of Regional Committee II

A mid term review meeting of Regional Committee II was conducted on January 24, 2014 at CIFRI, Barrackpore to review the action taken on the recommendations of 21st meeting of the committee held during July 19-20 at Hyderabad. Dr. B. Meenakumari, DDG (Fisheries Science) and Nodal Officer of this region chaired the meeting. Representatives from ICAR institutes, State Departments, ICAR Headquaters and Scientists of CIFRI attended the meeting. The meeting was started with the welcome address by Prof. A.P. Sharma, Director, CIFRI and Member Secretary of Regional Committee II. The action taken report was presented and discussed at the meeting. Special emphasis was given on development of agenda items for the 22nd meeting of Regional Committee II to be held during June 2014. The meeting was ended with the vote of thanks proposed by Dr. Arun Pandit, Senior Scientist, CIFRI and Nodal Scientist of this Regional Committee.

Launching workshop on 'National Surveillance Programme for Aquatic Animal Diseases'

The Guwahati Centre and College of Fisheries, AAU, Raha jointly organized a launching workshop of 'National Surveillance Programme for Aquatic Animal Diseases' project at College of Veterinary Science (AAU), Khanapara, Guwahati on 29.01.2014. Sri Basanta Das ji, Hon'ble Minister of Fisheries, Govt of Assam, Dr. K. M. Bujarbaruah, Vice Chancellor, AAU, Jorhat, Assam, Dr. A. K. Roy, Secretary (Fisheries), Govt. of Assam, Mr. M. Deka, Director (Fisheries), Govt. of Assam and Dr. A. K. Gogoi, ZPD, Zone-III, ICAR, Barapani were among the distinguished participants in the programme. Dr. B.K. Behera, Senior Scientist & PI and Mr. P. Das, Scientist & Co-PI of this project component of CIFRI and Dr. B. Kalita, Professor & PI and Dr. Ayub Ali Assoc. Professor & Co-PI of this project component of College of Fisheries (AAU), Raha were also present on this occasion. Another Launch workshop of the same Project was organized with West Bengal Fisheries Departmental Officials and Faculties of West Bengal Fisheries College, Kolkata at CIFRI, Barrackpore on 21st February, 2014 which was chaired by the Director of Fisheries, Government of West Bengal Smt. Malabika Jha.

Launching workshop of NFDB project

A workshop was organized on the occasion of launching of NFDB project "Development and demonstration of cage culture technology in reservoirs for raising table fish" on February 21, 2014 at Maithon, Jharkhand. The main aim of the workshop was to create awareness among the local fish farmers for raising table fish through cage culture technology. The workshop was attended by Prof. A.P. Sharma, Director CIFRI, Dr. Dilip Kumar, former VC, CIFE Mumbai, Dr. Vijayan Mandal, Senior Executive, NFDB, Dr. Salim Sultan, Senior executive, NFDB, Directors of state Fisheries Departments of Jharkhand, U.P., Bihar, Senior officers of M.P. Federation, DVC, Department of fisheries. W.B. Prof A. P. Sharma highlighted the CIFRI's success on cage culture technology for raising stocking materials and table size fish in reservoirs.

Workshop on Application of modeling approaches for management of inland open waters

One day Workshop on "Application of modelling approaches for management of Indian open water fisheries" was held at CIFRI, Barrackpore on February 20, 2014. All the scientists from CIFRI, Barrackpore, five scientists from regional centers, Allahabad, Bangalore and Guwahati participated in the workshop. Three national level experts Dr. E. Vivekanandan, Emeritus Scientist, CMFRI, Cochin, Dr. Sunil Kumar Mohammad, Principal Scientist and HOD of the Molluscan Fisheries Division, CMFRI and Dr. A. K. Roy, retired Principal Scientist, CIFA, Bhubaneshwar participated in the workshop. It was felt that there is immense scope for the forecasting model in reservoir fisheries by establishing link between water storage, chlorophyll estimation, rainfall and different stocking densities. Multi-institutional collaboration in the areas of water flow, ecosystem model was suggested. Simulation of fish production in the wetland, study of fresh water with river flow and coastal nutrient transportation in relation to fisheries, assessment of nutrient flow from rivers to the reservoir and that drain in the coastal region are some of the areas identified for study.

Researchers-Farmers-Resource Managers Meet for wetland fisheries development

CIFRI, Barrackpore organized a NFDB sponsored Researchers-Farmers-Resource Managers meet at North 24 Parganas Krishi Vigyan Kendra, Ashoknagar, West Bengal on March 13, 2014. Dr. M K Bandopadhyay welcomed the guests, fishers and SHG members for participation inthe meet. In the inaugural function Dr. F. Rahaman, ZPD (II), ICAR invited the wetland fishers to join hands with the researcher and KVK personnel to solve the problem in fisheries development. The Guest of Honour Dr. T.K.Ghosh, Head (Aquaculture Dept.), WBUAFS and Smt. A.S.Alvi, DDF, Directorate of Fisheries, West Bengal presented the potentiality of wetland fisheries development in North 24-Parganas district and the schemes available for these water resources respectively. Dr. M. A. Hassan, Acting Head, RWF Division, CIFRI gave due importance for conservation of indigenous wetland fishes germplasm, whose population is reducing day by day. A total of 136 fishers including men and women participated in the meet.

Training-cum-workshop on Pen aquaculture in beels of Assam

The Guwahati Centre organized a training-cum-workshop on "Pen aquaculture in beels of Assam" at the Centre on May 27-28. A total of 13 fisheries extension officers/ demonstrators /technical assistants working in the Department of Fisheries, Govt. of Assam in six different districts (Kamrup, Golaghat, Sivasagar, Dibrugarh, Jorhat and Tinsukia) participated in the programme. Various aspects of pen aquaculture technology developed and refined by the Institute over the years including relevance of the technology in relation to fisheries enhancements in the beels of the state, pre-stocking management, various aspect of stocking, post-stocking management, feed and feeding management, health management and data keeping for techno-economic analysis of pen aquaculture were thoroughly discussed. An interactive workshop was organized on the last day of the programme wherein scientists of this Centre interacted with the participants on various aspects of pen aquaculture with the objective to implement the pen aquaculture demonstration scheme financially supported by NEH Component of CIFRI, ICAR and being implemented by the Directorate of Fisheries, Govt. of Assam in different beels of Assam.

Inception meeting of demonstration of cage culture technology in Himachal Pradesh

The inception meeting under the project "Demonstration of cage culture technology in Himachal Pradesh reservoirs" was held on June 07, 2014 at CIFRI, Barrackpore. The meeting was chaired by Prof. A. P. Sharma, Director, CIFRI. The project was launched in the presence of Sri Gurcharan Singh, Director-cum-Warden of Fisheries, Himachal Pradesh. It was decided that the technologies would be demonstrated in the two reservoirs i.e. Govindsagar and Pong reservoir of Himachal Pradesh. In addition to this, the discussion on various issues like establishment of a carp feed mill for production of floating feed pellets, Strengthening GIS database and scientific study of reservoirs were discussed in detail during the meeting.

Events

Republic Day

CIFRI celebrated the republic Day with great enthusiasm on January 26, 2014. Prof A. P. Sharma, Director of the institute hoisted the tri-colour and paid rich tribute to the nation. In his speech, Prof Sharma recalled the achievements of CIFRI and urged all the staff to work hard to keep CIFRI's flag high. He emphasized on developing good working atmosphere and team spirit. All the CIFRI staff and members of the family were present on the occasion.

National Science Day

CIFRI celebrated National Science day on February 28, 2014 at the institute Headquarters. 'Fostering Scientific Temper' was the theme chosen for this year's National Science Day by the Department of Science and Technology (DST). On this occasion, drawing competition was organized for children of CIFRI staff. An elocution competition for Research scholars of CIFRI was also organized on the theme 'Fostering scientific temper". The winners were awarded prizes on the occassion. Dr. M.K. Das, Retd HoD, FREM division gave special lecture on various facets of scientific temper. Prof. A.P.Sharma urged all scientific team to develop scientific temper which involves the application of logic in our day to day life.

Annual sports meet by Recreation club

CIFRI Recreation club organized the annual sports meet during January 31 to February 01, 2014 at CIFRI. Barrackpore. The sports meet was inaugurated by the Director, Prof A. P. Sharma. All the staff including the Heads of the Divisions were also present during the meet. A number of staff participated in many events. The women's events included 100 m race, shot put, musical chair and hitting the pitcher whereas the men's events included 100 m race, shot put, kicking the football, hitting the wicket and limited over cricket.

CIFRI Foundation Day

CIFRI celebrated its 68th Foundation Day on March 17 and 18, 2014 at its headquarters in Barrackpore. On March 17, a day long interactive meeting was held among the Director, scientists and technical officers to discuss about achievements and shortcomings of the previous year and the various measures to be taken towards the goal of achieving excellence in output. On March 18, Foundation Day programmme was organized at Barrackpore. Brig. J.C. Talukdar, Station Commander, Barrackpore Cantonment graced the occasion as Chief Guest. In his welcome address Prof. A.P. Sharma, Director, CIFRI gave a brief account of the past history of the institute, major technologies developed and the current thrust area. Brig. Talukdar in his speech hailed the Director and the staff of the Institute for its glorious past and wished all success in its present endeavor to find solutions of some challenging situations like reduction in production and productivity, loss in biodiversity, degraded environment, captive breeding of Hilsa, effect of climate change on fish and fisheries etc. Dr. S. Satpathy, Former Director, Central Research Institute on Jute and Allied Fibre, Barrackpore was the Guest of Honour. The meritorious children belonging to CIFRI staff were felicitated on this day.

On-line NET Examination, 2014

CIFRI successfully conducted NET Examination, 2014 (I) in online mode at Barrackpore during March 26 to May 6, 2014. This is for the first time ICAR conducted online exam for NET. Out of 24 centres in India CIFRI is the one and only centre in West Bengal which has capacity to conduct online exam for 100 candidates at a time.

International Women's Day

International Women day was celebrated in CIFRI on March 08, 2014. The celebration included cultural programmes and special lectures by Heads of the Divisions. Dr. V. R. Suresh congratulated all the ladies of CIFRI for their efforts in accomplishing institutional responsibility and at the same time taking care of their families. Prof A.P. Sharma appreciated the dedication of women staff of the institute and sought their full cooperation for achieving excellence.

Sunderban Day

CIFRI conducted an 'interface meeting' with the fishers and resource managers at Madanganj, Namkhana, Sunderban on the occasion of Sunderban day on June 3, 2014. This was an initiative to sensitize the people of the area about the importance of natural resources and its sustainability. Madanganj area of Namkhana is one of the worst affected areas of Sunderban by *Aila* and still people of this area are trying to cope up with the after effects. During this interactive meeting major issue identified was continuing losing of mangrove vegetation. One of the prime reasons was unawareness of the people regarding the importance of Mangrove forests on their subsistence. Fish seed collection, deforestration results into destruction of the precious and ecologically sensitive mangrove forests. CIFRI team members led by Dr. Archana Sinha met the Panchayet Pradhan to discuss the issues identified in the 'interface meeting' and sought her cooperation in on going programme of conservation of small indigenous fish in the village.

ASRB Member visited CIFRI

Dr. S. K. Bandhyopadhyay, ASRB Member, visited CIFRI on March 14, 2014. He inspected the online examination facilities in CIFRI and had an interaction session with the institute scientists. Dr. Bandhyopadhyay appreciated the efforts of the scientists and simultaneously, urged the scientists to focus on publications, peer recognitions and development of innovative technologies for the society.

DG inaugurated the aquarium and multi-speciality training complex

Dr. S. Ayappan, Director General ICAR laid the foundation Stone on March 1, 2014 at CIFRI Headquarters for the proposed Aquarium and Multispeciality Training Complex. On the occasion, a number of dignitaries like Dr. V S Vijayan, Eminent Ecologist; Dr. Sadamate, Agricultural Convergence Expert of World Bank Project; Dr. Dilip Kumar, Ex-Director, CIFE, Mumbai were also present. The institute scientists, many other researchers, planners, extension personnel also participated in the ceremony.

Database on 'Nutritional composition of Food Fishes from India' launched

A comprehensive Database on 'Nutritional composition of Food Fishes from India' have been developed under Outreach-3 project, where all the nutritional information viz. proximate composition, amino acids and fatty acid profiles, vitamin and mineral profiles have been archived. The database contains the methodologies followed for generating nutritional information, publications, events and scientific manpower associated with this project. The database was formally launched by Dr. B. Meenakumari, Deputy Director General (Fisheries Science) at the Outreach Activities Review Meeting at NASC Complex, ICAR, New Delhi on May 9, 2014. Other dignitaries present during the launching program include Dr. S. D. Singh (ADG, Inland Fy.), Dr. Madam Mohan (ADG, Marine Fy.), Dr. J. K. Jena (Director, NBFGR), the Coordinator Dr. B. P. Mohanty and other PI and Co-PIs of the project. The database can be accessed at http://www.cifri.ernet.in/oureach.

Tribal Sub-plan activities

Endeavor towards upliftment of Tribal people in Bali Island, Sunderbans

Bali Island lying in Indian part of Sunderbans is vulnerable to extreme climatic events. Although agriculture remains a source of livelihood for the islanders, the brackishness of river water makes agriculture unsuitable and uncertain. The condition of the tribal people in the Island is poor as they are having few options for their livelihood because of low land holdings, less access and control over the resources. CIFRI has taken an initiative for canal fisheries development in the Bali Island to support the livelihood of the tribal inhabitants in collaboration with Bali Nature and Wild Life Conservation Society. The institute stocked advanced fingerlings of Indian major (*Catla catla, Labeo rohita, Cirrhinus mrigala*) and minor (*Labeo bata*) carps in two natural perennial canals in Bali. The group of tribals is managing the stocked canal that would support their livelihood as well as sustainability of canal fisheries in the area and conservation of the fish germplasm.

Ecosystem and fish diversity management for conservation and skill development of rural tribal of Sagar Island, Sunderbans

Tribal people belonging to *Santhal* community in Sagar Island have low level of literacy, declining or stagnant population and are economically backward but they are very close to the nature. CIFRI took an initiative to uplift the condition of the tribal population under TSP programme. Livelihood support component was added with the participation of the local communities. Five ponds belonging to tribals in Khansaheb Abaad village are selected to rear the identified fish species which became rare in Sagar island. In two freshwater ponds, seeds of six small indigenous fishes (SIFs) were stocked. On the other hand, in three saline water ponds, fish seeds of five SIFs were stocked. The stocked ponds are monitored by CIFRI on routine basis. After six months of rearing period a total of 62 kg fish were partially harvested, amounting Rs.18599.

Distribution of coracles to the tribal fishers of Suvarnavathy reservoir

Bangalore Research Centre of CIFRI organised a programme on February 8, 2014 at Suvarnavathy reservoir, Attugulipura, Chamarajanagr District, Karnataka state for distribution of eight numbers of fiberglass coracles to eight tribal fishers under Tribal Sub-plan. This is the first time that the fibreglass coracles have been introduced to the reservoir. The fiberglass variety is water proof, lasts longer and have low maintenance cost. Mr. B. R. Jagadeesh, Deputy Director of Fisheries, Mysore Zone, Government of Karnataka was the Chief Guest. CIFRI scientists, Officials from State Fisheries Department, fishers from Suvarnavathy reservoir and other reservoirs in the vicinity attended the programme. A leaflet in English and vernacular Kannada on the ecology and fisheries of Suvarnavathy reservoir along with recommendations for enhancement of fish production was distributed.

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

सिफरी समाचार

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निदेशक की ओर से

मैं इस न्युजलेटर का आरंभ एक अत्यन्त ही सुसमाचार से कर रहा हूँ और वह है – संस्थान को आई एस ओ 9000:2008 के प्रमाण पत्र की प्राप्ति। किसी भी कार्यालय/कार्य की सफलतम एवं सुव्यवस्थित संचालन के मानकीकरण का प्रमाणपत्र, आई एस ओ 9000:2008 इस संस्थान को मिलने का अर्थ है संस्थान में उत्तम प्रबंधन व्यवस्था का होना।

दिनांक 27–28 जून 2014 को संस्थान में भा. कृ. अनु. परिषद् की क्षेत्रीय समिति जोन ।। की 22 वीं बैठक का आयोजन किया गया। इस सम्मेलन में पश्चिम बंगाल एवं नये गठित राज्य, तेलंगाना के कृषि मंत्री, विभिन्न राज्यों, पश्चिम बंगाल, आडिसा, आन्ध्र प्रदेश, तेलंगाना एवं अण्डमान व निकोबार द्वीप समूह के सचिव, परिषद् के अनुसंधान संस्थानों/केन्द्रों के निदेशक/प्रभारी, भा. कृ. अनु. परिषद् के महानिदेशक एवं उप महानिदेशक और जोन।। क्षेत्र के कृषि विश्वविद्यालयों के उप कुलपति आदि जैसे महत्वपूर्ण प्रतिनिधियों ने भाग लिया। इस अवसर पर 16 प्रगतिशील कृषकों को सम्मानित किया गया।

इस दौरान साउथ एशियन फोरम फॉर एनवायरनमेन्ट के सहयोग से आर्द्रक्षेत्रों पर राष्ट्रीय सम्मलेन का आयोजन किया गया। इस सम्मेलन का विषय 'Mitigation and Adaptation Strategies in Wetlands; A Community Leadership Perspective' था तथा इसमें भागेदार, अनुसंधानकर्ता एवं योजनाकारों के बीच आर्द्रक्षेत्रों के संरक्षण एवं जलवायु परिवर्तन पर विचार विमर्श किया गया।

संस्थान के अनुसंधान कार्यों में कई उपलब्धियां अर्जित हुई हैं। दिरी और तांगोन नदियों के जलधारा प्रवाह का अध्ययन किया गया। ये नदियां परितंत्र एवं जैव विविधता के पोषण के लिये अत्यन्त ही महत्वपूर्ण हैं। हेमवती जलाशय के फूड वेब पर मत्स्य स्टॉक संपूरक के प्रभाव का आंकलन किया गया। असम के असंचयित एवं संचयित बीलों का तुलनात्मक अध्ययन किया गया तथा इन बीलों पर निर्भरशील मछुआरों के सामाजिक–आर्थिक जीवन पर मात्स्यिकी प्रबंधन प्रणाली के प्रभावों का आंकलन किया गया। वयालार में मौसमी जलाशयों के मत्स्य प्रजातियों के घनत्व संबंधी स्पेशियो टेम्पोरल भिन्नता का अध्ययन किया गया। प्रदूषण जैवसूचकों की पहचान के लिये रीता रीता कैटफिश प्रजाति पर सूचनाओं को एकत्र किया गया एवं आर्सेनिक प्रदूषण से लेबियो रोहिता के प्लाज्मा प्रोटियोम में हुये परिवर्तनों की जांच की गई। परीक्षण त्रसे यह तथ्य सामने आया है कि अमीनों एसिड के कारण छोटी रीढ़दार प्राणी में जैवरसायन अनुकूलन प्रकृति का विकास होता है जो इनके अतिजीविता के लिये अत्यन्त आवश्यक है।

पी मोनोडोन के उन्नत लार्वा के संग्रहण में शेल एवं फिन मछली के अनेक तरूण मछलियां नष्ट हो गईं। इसके कारण परितंत्र को हानि पहुंचने खतरा हो गया है जिससे प्राकृतिक प्रजनन में अवरूद्ध और देशी प्रजातियों के विलुप्त होने की आशंका बढ़ गई है। इन तरूण मछलियों के मरने से होने वाली संभावित आर्थिक क्षति का आंकलन किया गया है। उच्च रिजोलुशन वाले IRS – P6 LISS III सैटेलाइट से हुगली ज्वारनदमुख में आंकड़ों को भूमि सर्वेक्षण हेतु प्राप्त किया गया। महानदी में भारी धातु एवं कीटनाशक प्रदूषण का आंकलन किया गया। जलाशयों में पिंजरा पालन में व्यवहृत कम लागत वाली मछली चारा बनाया गया। इसमें मदिरास्थल के अवशेषों को प्रोटीन स्रोत के रूप में व्यवहार किया गया। आंकड़ा प्राप्ति हेतु एन्ड्रायड एपलिकेशन आधारित इलेक्ट्रोनिक डेटा एक्विजिशन सिस्टम (eDAS) का विकास किया गया है।

संस्थान से कुल 40 शोध पत्रों, 10 तकनीकी बुलेटिन, एक प्रशिक्षण मैनुअल तथा वार्षिक हिन्दी गृह पत्रिका, 'नीलांजलि' का प्रकाशन हुआ है। संस्थान में कुल 16 प्रशिक्षण कार्यक्रमों का आयोजन एवं संस्थान ने 11 प्रदर्शनियों में भाग लिया। संस्थान के अधिकारियों/कर्मचारियों को पुरस्कार प्राप्त हुआ है। कुल 15 अधिकारियों एवं कर्मचारियों को पदोन्नति दी गई है और उनके इस सफलता पर बधाई दी जाती है और यह आशा की जाती है कि वे संस्थान के विकास में अधिक सं अधिक योगदान देगें। संस्थान मुख्यालय में साथ ही सेवानिवृत्त हुये 8 अधिकारियों एवं कर्मचारियों के खुशहाल जीवन के लिये ईश्वर से प्रार्थना करता हूँ। संस्थान मुख्यालय में 10 नये वैज्ञानिकों की नियुक्ति पर बधाई देता हूँ और उनके सुनहरे भविष्य की कामना करता हूँ।

रिपोर्ट अवधि के दौरान संस्थान में मध्यावधि अनुसंधान सलाहकार समिति बैठक, मध्यावधि भा. कृ. अनु. परिषद् की क्षेत्रीय समिति जोन–।। बैठक, नई परियोजना जैसे हिमाचल प्रदेश में पिंजरा पालन तकनीक एवं अन्य कई परियोजनाओं की आंरभिक बैठक, 'असम के बीलों में पेन पालन' पर प्रशिक्षण कार्यशाला एवं अन्य कई बैठकों का आयोजन हुआ। इस दौरान संस्थान में गणतंत्र दिवस, राष्ट्रीय विज्ञान दिवस, वार्षिक खेल–कूद प्रतियोगिता, संस्थान संस्थापना दिवस, अंतर्राष्ट्रीय महिला दिवस, सुन्दरवन दिवस, एक्वेरियम एवं बहु–सुविधा प्रयिक्षण परिसर आदि आदि मनाया गया।

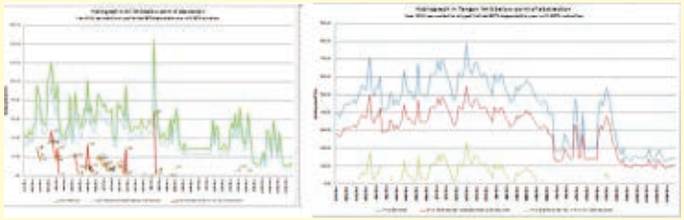
यह न्यूजलेटर आपके समक्ष प्रस्तुत है, इसे और भी उपयोगी एवं आकर्षक बनाने हेतु आपके सुझाव आमंत्रित हैं।

अनिल प्रकाश शर्मा

अनुसंधान उपलब्धियाँ

अरूणाचल प्रदेश के दिरी एवं तंगान नदियों की जलधारा

अरूणाचल प्रदेश के दिरी एवं तंगान नदियों की जलधारा का संगम दिबांग नदी में होता है। यह नदी सियांग नदी की मुख्य सहायक नदी है। विभिन्न जलविद्युत परियोजनाओं से जल धारा पर पड़ने वाली दुष्प्रभावों को कम करने में इन दोनों नदियों की विशेष भूमिका है। अतः इन नदियों की जलधाराओं का अध्ययन किया गया। अध्ययन में यह देखा गया कि इन नदियों की जलधारा प्रवाह मार्ग में परिवर्तन हुआ है।



ए के साहू, ए पी शर्मा, सौमा दास, भी आर सुरेश

असम के बीलों में पेन पालन का प्रदर्शन

संस्थान के असम मात्स्यिकी विकास निगम लिमिटेड, गुवाहाटी के सहयोग से असम के 34 बीलों में पेन पालन तकनीक का प्रदर्शन किया। इन बीलों में 0.24–0.49 हे. क्षेत्र में चौकोर पेन लगाये गये। इन पेन को स्थानीय तौर पर प्राप्त कम लागत वाली बाँस और एल डी पी ई मच्छरदानी से बनाया गया। इनकी लागत मूल्य रू.49,511 से 87,211 था। इन बीलों में कार्प प्रजातियों के फ्राई/अंगुलिकाओं को (2–7 फ्राई/अंगुलिका प्रति वर्ग मी. की दर से) का संचयन किया गया। इन कार्प प्रजातियों में कतलाःरोहूःमृगल का अनुपात 40:30:30 रखा गया। कुछ बीलों में साइप्रिनस कार्पियों एवं ग्रास कार्प, *Ctenopharyngodon idella* को भी संचयन किया गया। इन फ्राई/अंगुलिकाओं को चावल एवं सरसों की खली के मिश्रण से बने चारे को उनके शारीरिक भार के 2–5 प्रतिशत की दर से दिया गया। तीन महीने बाद प्रति पेन से उत्पादन 875 से 1357 कि.ग्रा के बीच हुआ। उत्पादन संबंधी आंकड़ें यह बतातो हैं कि पेन पालन कार्प अंगुलिका पालन के लिये उपयुक्त तकनीक है।

बी के भट्टाचार्य, ए पी शर्मा, ए दास, पी दास, के के सरमा, ए ककाती, एस एन गोस्वामी एवं सोना येंगकोकपम

पानचेट जलाशय में मत्स्य संग्रहण संरचना और विविधता

पानचेट जलाशय एक वृहद जलाशय है और इसका क्षेत्रफल 7,511 हे. है। इसका निर्माण वर्ष 1958 में दामोदर एवं बरोकर नदियों के संगम पर किया गया था। इस जलाशय में कुल11 वर्ग, 19 जेनेरा एवं 27 मत्स्य प्रजातियां हैं। साप्रिनिडा वर्ग में प्रधान प्रजाति सिरहिनस मृगला (40 प्रतिशत) है। इसके बाद लेबियो रोहिता 20 प्रतिशत, लेबियो कलबसु 5 प्रतिशत और कतला कतला 4 प्रतिशत आते हैं। कैटफिश वर्ग में स्पेराटा सिंघाला 15 प्रतिशत और एस एओर 5 प्रतिशत थे। अन्य कैटफिश *Ailia coila*, *Wallago attu*, *Mystus tengara* एवं *Ompak bimaculatus* 4 प्रतिशत और विविध प्रजातियां *Gudusia chapra*, *Osteobrama cotio*, *Glossogobius giuris*, *Salmophasia bacaila* एवं *Pseudambasis ranga* 7 प्रतिशत थीं। मत्स्य संग्रहण अक्टूबर, 2013 में 0.256 कि.ग्रा. प्रति बोट प्रति दिन तथा मार्च, 2014 में 2.88 कि.ग्रा. प्रति बोट प्रति दिन था। जलाशय से मत्स्य उत्पादन बहुत ही कम 3.288 कि.ग्रा. प्रति बोट प्रति दिन रहा तथा मृगल का उत्पादन कतला एवं रोहू से अधिक था।

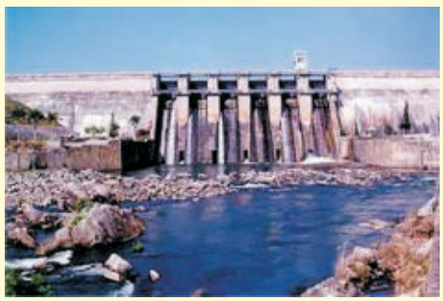
डी पंडा एवं संध्या के एम

शिंगटी मछलियों का आर्थिक मूल्यांकन

सुन्दरवन ज्वारनदमुख में मछुआरों के आजीविका को मुख्य स्रोत लार्वा पश्चात् शिंगटी मछलियों को पकड़ना है। दक्षिण 24 परगना के बक्खाली एवं गोसाबा क्षेत्र के 54 परिवारों का सर्वेक्षण किया गया। ये सर्वेक्षण यह बताते हैं कि इन मछलियों का संग्रहण अधिकतर महिला मछुआरों द्वारा होती है जबकि इन परिवारों के बच्चें शिंगछी मछली के लार्वा को अलग करने एवं उन्हे फिर से जल में छोड़ने का काम करते हैं। पर इन शिंगटी मछलियों के संग्रहण के समय अन्य बहुत का जलीय जीव एवं प्रजातियां नष्ट हो जाती हैं। जैसे पी मोनोडोन के लार्वा संग्रहण में बहुत सी शेल एवं फिन मछलियों की तरूण प्रजातियां नष्ट हो जाती हैं। दससे परितंत्र को हानि होने के साथ प्रजनन प्रक्रिया को भी क्षति पहुंचती है। इससे बहुत सी प्रजातियों के विलुप्त होने को भी खतरा बढ़ गया है। शिंगटी मछलियों को संग्रहण सबसे अधिक मार्च से जून महीनों के बीच होता है। इस अवधि के दौरान आर्थिक क्षति कुल रू 13.45 लाख प्रति बोट आंका गया है।

अंजना एक्का, अरूण पंडित एवं दीपक कुमार बिश्वास

हेमावती नदी के फूड वेब पर मत्स्य स्टॉक संपूरकों का प्रभाव



कर्नाटक के हेमावती जलाशय में मास–बैलेन्स मॉडल का विकास 1982–83 और 2002–03 के ट्रोफिक स्थिति एवं ऊर्जा प्रवाह के आंकलन द्वारा किया गया। प्राप्त इकोपाथ संचयित मत्स्य प्रजातियो, मेजर कार्प प्रजातियों एवं विदेशी कार्प प्रजातियों पर हुये प्रभाव को दिखाता है। कैटफिश के संचयन से, केवल गोबिड प्रजाति को छोड़कर, अन्य सभी प्रजातियों पर प्रतिकूल प्रभाव पड़ा था। पर ईल, विदेशी कार्प प्रजातियों और माइनर कार्प पर संचयन पूर्व सकारात्मक प्रभाव पड़ा था। पारिस्थितिकी तंत्र का विश्लेषण यह बताते हैं कि संचयन पश्चात् वाले फूड वेब, संयचन पूर्व वाले फूड वेब से अधिक विकसित थे।

फिरोज खान एवं प्रीथा पनिक्कर

असम के बीलों की पारिस्थितिकी एवं मात्स्यिकी

असम के विभिन्न बीलों, धीर, सुकदोल–सारूबरी, तरियाचरा, मेर एवं दमाल में मात्स्यिकी एवं पारिस्थितिकी पर मत्स्य स्टॉक संवर्धन के प्रभाव का आंकलन किया गया। असंचयित बील में छोटी साइप्रिडिनस प्रजातियां जैसे, *Puntius* spp., *Labeo gonius*, *Cirrhinus reba* और *Psilorhynchus* spp. की प्रधानता थी। *Wallago attu, Colisa* spp. और *Mystus* spp 10 प्रतिशत तथा भारतीय मेजर कार्प, ग्रास कार्प एवं कॉमन कार्प 11 प्रतिशत पाये गये। संचयित क्षेत्रों में भारतीय मेजर कार्प एवं विदेशी कार्प 55–70 प्रतिशत पाये गये।

पी दास, बी के भट्टाचार्य, सोना येंगकोकपम, ए के यादव, के के सरमा एवं ए ककाती

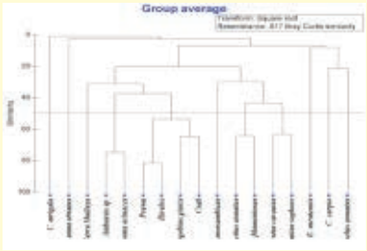
असम के बीलों मात्स्यिकी प्रबंधन एवं मछुआरों का आर्थिक–सामाजिक जीवन

छिछले और असंचयित बीलों में छिछले और संचयित बीलों की तुलना में मात्स्यिकी से आय 47 प्रतिशत अधिक और गहरे व संचयित बीलों से 5 प्रतिशत अधिक प्राप्त किया गया। इस वर्ष मात्स्यिकी से जुड़ी आजीविका के साधन छिछले और असंचयित बीलों में छिछले और संचयित बीलों की तुलना में 18 प्रतिशत और गहरे व संचयित बीलों से 14 प्रतिशत अधिक था।

एस एन गोस्वामी, बी के भट्टाचार्य, के के सरमा, सोना येंगकोकपम, ए ककाती एवं ए दास

वयालार जलाशय में प्रजाति घनत्व एवं स्पेशियो–टेम्पोरल वेरियेशन

केरल की एक छोटी मौसमी जलाशय, वयालार (259 हे.) में Carlsson trophic state index प्रणाली द्वारा इसकी इयुट्रोफिकेशन को मापा गया जिससे जल की सेकी डिस्क पारदर्शिता और क्लोरोफिल के स्तर को जाना जा सके। इस जलाशय की संभावित मत्स्य उत्पादन 130 कि.ग्रा प्रति हे. है तथा यहां अधिकतम उत्पादन 70 कि.ग्रा प्रति हे. प्राप्त किया गया। प्रयोगात्मक मत्स्ययन द्वारा बहु–छिद्र गिल जाल के प्रयोग से 14 मत्स्य प्रजातियों की उपलब्धता को दर्ज किया गया। इन प्रजातियों में स्थानीय प्रजातियां *Puntius filamaentosus, P. sophore, Mystus armatus* और *M. cavasius* को देखा गया। स्थिर जल में प्रजाति भिन्नता अधिक देखी गयी।



रानी पालानीस्वामी एवं एस मनोहरन

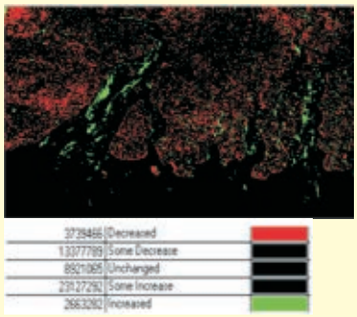
आर्सेनिक प्रदूषण से प्लाज्मा प्रोटियोम में परिवर्तन

आर्सेनिक प्रदूषण के कारण हुये हेपाटॉक्सिसिटी एवं यकृत संबंधी गंभीर बिमारियों के लिये प्रोटियोमिक जैवसूचकों की पहचान कर ली गई। ये जैवसूचक हैं – Apo-A1 (Apolipoprotein-A1), A2ML (α-2 macroglobulin-like protein), Wap65 (warm-temperature acclimation related 65kDa protein).

बी पी मोहान्ति

रिमोट सेंसिंग से क्षेत्र परिवर्तन का विश्लेषण

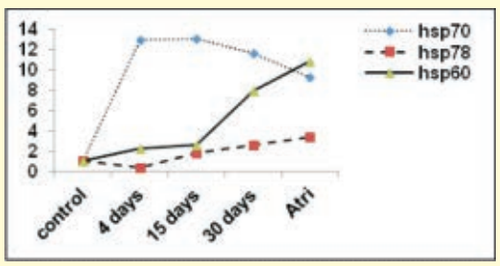
हुगली ज्वारनदमुख में IRS - P6 LISS III अधिक रिजोलुशन वाले सैटेलाइट सेंसर डेटा यह बताते हैं कि वर्ष 2004 से वर्ष 2012 तक 12.35 प्रतिशत क्षेत्र संपूर्ण रूप से परिवर्तित हो गये हैं, 70.43 प्रतिशत क्षेत्र में आंशिक परिवर्तन एवं 12.35 प्रतिशत क्षेत्र में कोई परिवर्तन नहीं हुआ है। यह परिवर्तन भूमि उपयोग एवं ज्वारनदमुखीय तलछट द्वारा परिलक्षित होता है। हुगली ज्वारनदमुखीय में स्थित चार द्वीप, घरामारा, नयाचार, गंगासागर और जम्मू के मुहाने क्षेत्र में 13.63%, 5.88%, 2.94% और 28.31% तक परिवर्तन हुआ है।



एस के साहू एवं डि करूणाकरन

एच एस पी जीन विश्लेषण

मरेल प्रजाति, चन्ना स्ट्रिटस के एच एस पी जीन प्रोफाइल का विश्लेषण किया गया जिससे उच्च तापमान (36 डिग्री सेल्सियस) में इसकी ताप सहन क्षमता को जाना जा सके। इसको तीन बार, 4 दिनों, 15 दिनों और 30 दिनों के लिये इस तापमान में रखा गया कि कितने दिनों तक यह प्रजाति ऐसे उच्च तापमान में जीवित रह सकती है।

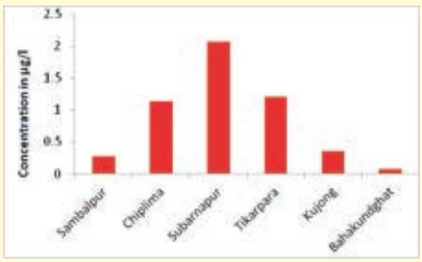


बी पी मोहान्ति

महानदी में भारी धातुओं और कीटनाशक प्रदूषण

महानदी का जलक्षेत्र धातु (कैडमियम, कॉपर, मैंगनीज, लेड एवं जिंक) प्रदूषण से मुक्त पाया गया है। इसके तलछट में कहीं–कहीं केवल कॉपर का स्तर 25 पी पी एम पाया गया जो प्रदूषण की ओर इंगित करता है। पर मछली में किसी प्रकार का धातु और ऑरगेनोक्लोरिन प्रदूषण नहीं पाया गया।

महानदी हिराकुड बांध के निचले क्षेत्र में महानदी नदी का 400 कि.मी. के विस्तार क्षेत्र में इंटरगिटि

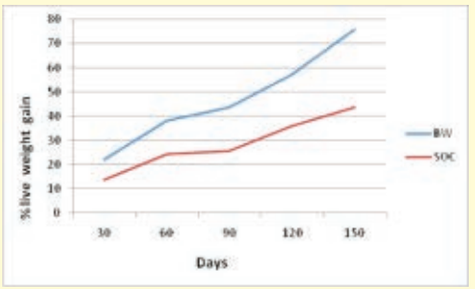


क्लास प्राचल निर्धारित स्तर से कम पाया गया है। नदी विस्तार क्षेत्र का अध्ययन यह बताते हैं कि इस क्षेत्र का 40 प्रतिशत भाग को कम हानि हुई है पर इसका 60 प्रतिशत भाग सामान्य रूप से क्षतिग्रस्त है। जल धारा परिवर्तन हुये क्षेत्रों में आई बी आई स्कोर कम है जो पारिस्थितिकी एवं बायोटिक इंटिग्रिटी पर धारा के क्षतिग्रस्त प्रभाव को दिखाते हैं। वर्ष 1995–96 के जलीय प्राचलों के तुलनात्मक अध्ययन यह बताते हैं कि शेष जलीय प्राचलों को छोड़कर केवल फॉस्फेट का स्तर थोड़ी अधिक है। इसी प्रकार, वर्ष 1995–96 के तलछट का तुलनात्मक अध्ययन यह बताता है कि स्थिर जल क्षेत्रों के तलछट में जैव कार्बनिक तत्व का स्तर बढ़ा है।

एस सामन्ता, एस के नाग, के साहा, एस बन्द्योपाध्याय एवं ए घोष

जलाशयों में पिंजरा पालन में शराब के अवशिष्ट पदार्थ को प्रोटीन स्रोत के रूप में प्रयोग

सोयाबीन के प्रोटीन के उत्तक स्रोत होने प्रति लोगों जागरूकता बढ़ने से अब यह बहुत महंगा हो गया है। इसलिये मछलियों के भोजन के लिये सोयाबीन की खली के विकल्प के रूप में शराब के कारखाने के अवशिष्ट से बने पदार्थ का उपयोग किया जा रहा है। इसकी लागत मूल्य बहुत कम होती है। इस अवशिष्ट से तैरते हुये फिश पैलेट बनाये जा गये। इस भोजन को माइथन बांध में लगाये पिंजरों में लेबियो रोहिता के अंगुलिकाओं को दिया गया। यह देखा गया कि शीतकाल में (तापमान 19–24 डिग्री सेल्सियस के बीच) मछलियों का विकास दर कम है पर अधिक तापमान पर विकास अच्छा हुआ। मछलियों के शारीरिक भार में 75.8 प्रतिशत की वृद्धि हुई।



मो. अफ्ताबुद्दीन, एम ए हसन एवं डी के मीणा

FISH FACT

First ever international instrument dedicated to defending and promoting small-scale fisheries

At the 31st Session of the Committee on Fisheries (COFI 31) of the FAO, 143 Members States adopted this instrument dedicated to defending and promoting small-scale fisheries on 10 June 2014. The instrument takes the form of "Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Alleviation". The new instrument is global in scope, and applies to small-scale fisheries in all contexts, but with a specific focus on the needs of small-scale fishing communities in developing countries.

http://www.fao.org/cofi/23885-09a60857a289b96d28c31433643996c84.pdf

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