



The Inland Fisheries News

Newsletter of the Central Inland Capture Fisheries Research Institute

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FROM DIRECTOR'S DESK



The Task Ahead

In recent years alteration in aquatic habitat and hydrological regime of inland water areas due to flood control structures, water abstraction and pollution have adversely affected productivity, fish community structure and fish yield of open water systems. Keeping this aspect in view the nation will expect from CIFRI definite policy guidelines for dealing with such changing eco-patterns, restoration of aquatic ecosystems, rehabilitation and conservation of depleted fish stocks and above all management technology for sustainable fish production from inland waters and measures and methods for increased fishing efficiency and socio-economic uplift of fishing community. With a view to achieving these objectives and fulfilling the critical gaps, the Institute has identified the under mentioned areas of research and extension in the first two decades of twenty-first century.

- Generation of an appropriate cartographic data base and GIS in inland fisheries.

- Development of models to establish relationship between fish production and water productivity to predict fish catch.
- Study ecology, production processes and fisheries of various river systems.
- Study the effect of various hydraulic structures and environmental alterations on fish.
- Ecological investigations and management strategy for large reservoirs.
- Development of appropriate management models for small reservoirs.
- Cage culture in reservoirs.
- Ecological studies of various estuaries of India.
- Behavioral studies of Hilsa in relation to river hydrodynamics.
- Survey of beels and developing management systems for different categories of beels.
- Standardizing pen culture and cage culture techniques in the beels.
- Monitoring of different inland ecosystems in terms of toxicant accumulation in food chain and standardize the various indicators of pollution.
- Standardize permissible limits of various toxicants and water quality for fish.
- Studying the aetiology and pathology of various fish diseases and standardizing the various physiological indicators for fish stress diagnosis.
- Standardizing immunological techniques for augmenting defence mechanism of fish.
- Develop quarantine procedures and remedial measures for fish diseases.
- Develop trained manpower for fisheries development through training programmes, demonstrations and public awareness programmes.
- Consultancy services for EIA, reservoirs and beel fisheries development.

The slogan in the new millennium need be sustainable fisheries development through proper management and conservation of the natural resources to meet the needs of the present without infringing on the interest of future.

SUBANSIRI RIVER - A BOON FOR FISHERY IN UPPER ASSAM

Once known as the “Gold Mine” River Subansiri, one of the most important rivers of the Brahmaputra river system harbours a wide spectrum of fishes and is a famous attraction for Mahseer angling.

Scientists of CIFRI investigated the various ecological and fishery aspects of this very important riverine ecosystem in the north-east.

River Subansiri, travels a distance of nearly 375 km through the states of Arunachal Pradesh and Assam before meeting the main Brahmaputra river near the famous Majuli island. The river has a catchment area of 28,200 km² with an annual average water discharge of 52,705 million cubic meter.

Fish production potential of the river

The water quality parameters such as rich dissolved oxygen (9.0 mg l⁻¹), alkaline pH (7.6), medium to high alkalinity (av. 48.8 mg l⁻¹), conductance (123.3 μmhos), dissolved salts (61.9 mg l⁻¹), hardness (60.7 mg l⁻¹), and rich organic matter (1.7 mg l⁻¹) reflect productive character of the river. Low water temperature (av. 14.0 °C) and high transparency (86.4 cm) provide conducive environment for cold water fishes. The productive nature of the river is also supported by the high values of fish production potential (nearly 100 kg ha⁻¹ yr⁻¹) estimated from energy flow studies.



A view of the river Subansiri

But the unique feature is the existence of two types of fishery structure. The upper stretch is dominated by Mahseer species *Tor putitora* and *Neolisochilus hexagonolepis* and cold water species *L. dero* and *L. dyochilus* (the average catch of these species 40 to 80 kg day⁻¹) while the lower stretch is dominated by

W. attu, *M. aor*, *P. sarana*, *L. calbasu*, *L. goniuis* and prawn (the average catch 200 kg day⁻¹). The main landing centres for the upper stretch fishes are N. Lakhimpur, Gogamukh and Dhemaji while lower stretch fishes are generally assembled at Jorhat. Considerable quantity of fishes are also sent to Arunachal Pradesh.

Its contribution to fish production in beels

The river besides harbouring a good fishery resource in river, plays an important role in maintaining sustained good production from the beels of N. Lakhimpur and Dhemaji districts of upper Assam as well as a cluster of beels in Majuli island. Although the average fish production from the beels in Assam is very poor (one tenth of the potential) but the beels of Assam sustained by Subansiri have shown very high production rates as reflected in the daily landing of beel fishes in the markets of N. Lakhimpur (av. 800 kg day⁻¹), Gogamukh (450 kg day⁻¹), Dhemaji as well as from Majuli island (500 kg day⁻¹). Without putting much effort for stocking and management such high production from these beels are achieved mainly due to auto stocking by river Subansiri. The beels in upper Assam get connected to the river during flood season and are automatically stocked with riverine fishes year after year. Even the beels in Majuli island receive stocking material from Subansiri. The catch structure of the beels, show dominance of *W. attu*, *M. seenghala*, *L. goniuis*, *L. calbasu*, *C. mrigala*, *C. catla*, *Channa* sp., *Puntius* sp., *H. fossilis* and prawn, akin to the fishery structure of the feeding river. Thus the high production from beels of upper Assam, totally depend on the natural stocking by the river Subansiri which in turn is a boon for upper Assam as far as fishery is concerned.

DECLINE IN FISHERIES OF RIVER YAMUNA—A CUMULATIVE EFFECT OF HUMAN INTERFERENCES

Yamuna, one of the largest perennial tributary of River Ganga harbour a good commercial fishery (119.49t yr⁻¹) comprising Indian major carps and catfishes. But in recent years the fish stock in the entire stretch appear to have declined. Scientists of CIFRI studied the factors responsible for the decline at eight selected centres viz. Dehradun (Dakpatthar), Yamunanagar, Delhi, Mathura, Agra, Etawah and Auraia (Shergarh) pertaining to several biotic and abiotic characteristics.

The total fish landing from the river has declined from 39.38 t to 13.80 t per year during a span of 5 years from 1988 to 1992. The Indian major carps rank last (21.24%) as compared to catfishes (51.88%) and miscellaneous fishes (26.88%). Though there has been a decline in yield the qualitative decline is not significant since more than 50 species of fishes are in existence. *Cyprinus carpio*, hitherto unknown in river Yamuna has established itself, registering an increase of 0.67% (90-91) to 19.82% (93-94), and posing a severe threat to our indigenous carps.



Sewage discharge at Etawah

The spatio-temporal variations in the availability of carp spawn show that the quantitative index ($6.15 \text{ ml net}^{-1} \text{ h}^{-1}$) of carp spawn in the stretch has declined approximately four times as recorded in 1968-71 ($25.62 \text{ ml net}^{-1} \text{ h}^{-1}$). However, the qualitative index, recorded as 59.0% to 59.69% rather improved in comparison to those recorded in 1968 (42.9-51.0%). The decline in fish and spawn production is due to the following factors.

- **Environmental degradation** : Toxicants find their way into river Yamuna through effluents from sugar mills, paper mills, breweries, steel industries, thermal waste, fertilizer plant waste, oil refinery waste, handloom dye waste and above all domestic and city sewage. As a result the BOD values showed a regular increasing trend from Dakpatthar ($2.5\text{-}3.5 \text{ mg l}^{-1}$) to downward at Agra ($12.02\text{-}14.0 \text{ mg l}^{-1}$) indicating organic pollution. The values of organic carbon increase gradually from Dakpatthar (0.21) to higher polluted zones of Delhi (0.85%) and Agra (1.08%), indicating accumulation of combined wastes all along the river course. Toxic heavy metals in sediments all along middle stretch of the river are indicated by higher values of zinc and copper ranging from $366.48 \mu\text{g g}^{-1}$ - $348.09 \mu\text{g g}^{-1}$ and $96.4 \mu\text{g g}^{-1}$ - $52.78 \mu\text{g g}^{-1}$, respectively.

- **Decline in fish food organisms** : Most of the living forms (planktonic, periphytic and bottom dwellers) forming food for fishes have declined from year to year.

On an average plankton declined from $2,579 \text{ u l}^{-1}$ (90-91) to 505 u l^{-1} (94-95) and periphyton declined $12,671 \text{ u cm}^{-2}$ (90-91) to 370 u cm^{-2} (94-95) in the stretch studied. The regular presence of *Phormidium* spp. indicated gross pollution at Delhi, Mathura and Agra.

- **Dams and anthropogenic stresses** : Dams and weirs constructed at various places such as Dakpatthar, Pontasaheb, Yamunanagar, Wazirabad have lowered the current velocity and altered the current pattern, resulting in destruction of traditional nursery and breeding grounds. Withdrawal of water and large scale abstraction through lift irrigation complexes and water lifting units, and soil erosion due to deforestation in catchment areas are some of the factors affecting fish stock.

- **Over fishing** : Indiscriminate fishing during closed season, involving brood stock and juveniles has effected fishery decline. The minimum water level recorded for more than 8 months facilitates capture of sizeable number of fingerlings of Indian major carps, catfishes and miscellaneous fishes.



Waste discharge at Mathura

An overall assessment of the biotic and abiotic degradation reveals that the self purifying capacity of the river is lost only in certain stretches and can be improved by implementing corrective measures such as banning the discharge of domestic and industrial wastes of diverse origin. The chemical fertilizers and detergents should be totally stopped enforcing legislation. An average water level in the river must be maintained. The fishery regulation laws such as implementation of closed season, mesh size regulation, fish size regulation, ban on capturing advanced fry and fingerlings must be implemented. To protect the brood stock, the river stretch at and around 'Panchnada' may be declared as sanctuary. Mass elimination programmes of exotic fish *Cyprinus carpio*, specially the gravid ones, may be done to protect our indigenous species.

CIFRI LIBRARY THE HEART OF OUR RESEARCH AND DEVELOPMENT

The CIFRI Library has played a vital role in the process of research and development of the Institute.

The library's collection and services are moulded to make it a communication centre of information to the scientists and students engaged in fisheries research and education in the country.

CIFRI library came into existence along with the establishment of the Institute in Calcutta in March, 1947. In 1959 with the shifting of the Institute to its own building at Barrackpore, the activities of the library were geared up and in 1962 full fledged intensified library services was started. At present the central library is housed in the Paryavaran Bhavan of the Institute



CIFRI library

CIFRI library is subject specialized library covering fish and fisheries in general and inland fisheries in particular. However the holdings of the library cover the multidisciplinary nature of subjects which are essential for fisheries research and development. The library consists of books, journals, reports, bibliographies, abstracts, maps and toposheets, thesis, proceedings, photocopies, departmental publications, reprints, etc. and also various computer disc on various aspects which make approximately 35,000 volumes of publications in total. Within these categories periodicals and reports which are treated as principal means of communication, cover two third of its collection. At present selected 260 journals are received by the library regularly though the total titles

of the same exceed 750. At present library has about 8,500 books, 4,300 reprints, 950 maps, 4,000 miscellaneous publications and 12,000 volumes of journals excluding huge quantity of departmental publications, reprints and other reading materials.

NATIONAL SEMINAR

National Seminar on Eco-Friendly Management of Resources for Doubling Fish Production — Strategies for 21st Century

A National Seminar on Eco-Friendly Management of Resources for Doubling Fish Production – Strategies for 21st Century was organised jointly by the Inland Fisheries Society of India and Central Inland Capture Fisheries Research Institute on 22nd and 23rd December 1999 at Barrackpore. The seminar was inaugurated by Dr. G. N. Mitra a leading fishery scientist of 20th century in a function presided over by Dr. K. Gopa Kumar, Deputy Director General (Fy), ICAR. Dr. H. L. Chaudhuri, Dr. P. V. Dehadrai and Dr. H.P.C. Shetty were guest of honour. More than 167 participants representing Research Institutes, Universities, State Governments, N.G.Os presented 74 research papers.



Distinguished guests at inaugural function of the National Seminar

There were six technical sessions covering various aspects of inland fisheries viz. *Biodiversity, conservation and sustainable production; environmental issues; fish physiology and pathology; resource management; aquaculture; socio-economics, extension information and fisheries education.*

The fruitful deliberations by participants brought into focus the status of various inland fisheries resource in terms of their biodiversity, environmental constraints, cultural aspects, socio-economic aspects and their management strategies for sustained development.

The seminar concluded with the plenary session chaired by Dr. P.V. Dehadrai and Dr. M. Sinha. After elaborate discussions on various draft recommendation the house finally approved the recommendations of the seminar.

MANPOWER DEVELOPMENT

Summer School on Ecology, Fisheries and Fish Stock Assessment of Indian Rivers

A 30 days Summer School on Ecology, Fisheries and Fish stock Assessment of Indian Rivers was organised by CIFRI at Barrackpore from 14th July to 12th August 1999. A total number of 25 participants from across the country representing Agricultural and conventional Universities, State Fishery Departments, ICAR Institutes participated in the Summer School. Altogether 38 lectures were delivered on water chemistry, ecology, river pollution and its monitoring, environment and fisheries - case studies, resource/production functions and stock assessment and socio-economics. The lectures were compiled in the form of a book and distributed among the participants.



A participant receiving his certificate

Training course on Openwater Fisheries Technologies and Extension Methods

A 8 day training programme was organised at Barrackpore during November 2-9, 1999. A total of eleven Fishery officer from various states participated. Theoretical, practical classes with practical assignments, field visits were organised. Lectures were delivered

by scientists on technologies relevant to open water system and practical classes were conducted on chemistry, fish pathology and extension techniques. The trainees expressed their happiness regarding the course conductance.



A participant presenting his investigation report

Training course on Conservation and Sustainable Fishery Management of the Floodplain Wetlands in the North-East

A training programme on Conservation and Sustainable Fishery Management of the Floodplain Wetlands in the North-East was organised by the Floodplain Wetland Division of SAPPHERE at Agouti from 29th November to 5th December 1999.

Shri Babul Das, Hon'ble Minister for Fisheries, Govt. of Assam, inaugurated the training at a function held at the Media Centre of the Press Information Bureau, Guwahati on 29th November 1999. While welcoming the guests and the participants, Dr. M. Sinha, Director of the Institute stated that there was an urgent need to provide extra research thrust to the fishery development activities of the northeast.

In his inaugural address, Shri Babul Das, Minister of Fisheries, Govt. of Assam, expressed his happiness to inaugurate the training programme. He stated that the state of Assam was endowed with a bounty of aquatic resources for fisheries development.

In his presidential address, Shri L. Rynjah, IAS, Commissioner & Secretary, Agriculture, Government of Assam, lauded the efforts of CIFRI for organising a training exclusively for the fishery officials of the northeastern states.

He particularly appreciated the effort of the Institute in conducting the training within the region itself. Dr. V.V. Sugunan, Principal Scientist & Head, Floodplain Wetlands Division of CIFRI, Guwahati, proposed the vote of thanks.



Inaugural session in progress

The training was attended by 14 personnel sponsored by the Department of Fisheries, Fisheries Development Corporation, Panchayat & Rural Development Department, ICAR Research Complex for NEH Region besides two constituent Colleges of Gauhati University. The broad topics covered during the training were : (1) *Conceptual framework*, (2) *Habitat variables*, (3) *Biotic communities*, (4) *Fishery management*, (5) *Case studies : Experience of management in different categories of beels in Bihar and West Bengal and lessons for northeast.* and (6) *Management norms for conservation and sustainable utilization of the aquatic resources.*

Lectures were delivered by scientists of the Institute. Guest lecturers from Universities, ICAR Headquarters also delivered lectures. Scientists and technical officer of the institute imparted practical training on various aspects of ecology and fisheries of flood plain wetlands. In the feedback session the trainees expressed full satisfaction over the content of the training programme.

Dr. Hiralal Duarah, Vice Chancellor, Gauhati University distributed the certificates to the trainees.

EXTENSION SCENE

KVK Activities

The following training courses were organised at KVK, Kakdwip during July to December 1999.

| Subject | Status of training | No. of Courses | Beneficiaries |
|----------------|--------------------|----------------|---------------|
| Fishery | Off campus | 11 | 253 |
| Agronomy | On campus | 1 | 50 |
| | Off campus | 7 | 160 |
| Horticulture | On campus | 1 | 16 |
| | Off campus | 10 | 309 |
| Animal Science | Off campus | 10 | 212 |
| Home Science | On campus | 1 | 10 |
| | Off campus | 8 | 164 |

VISITORS

Shri Hukumdeo Narayan Yadav, Union Minister of State for Agriculture visits CIFRI Allahabad Centre



Shri Hukumdeo Narayan Yadav visiting the Allahabd Centre of CIFRI

The Hon'ble Union Minister of State for Agriculture, Shri Hukumdeo Narayan Yadav paid a visit to the Institute's Allahabad Centre on 12th December 1999. Dr. R.S. Panwar, Principal Scientist and Officer-in-Charge of the Centre apprised him of the activities and achievements of the CIFRI Centre. The Hon'ble Minister showed keen interest in the research work being conducted and expressed satisfaction over the performance of the Centre.

MEETING

Research Advisory Committee

A mid-term appraisal by Research Advisory Committee (RAC) of the Institute was done in its meeting held at CIFRI, Barrackpore on 20th December 1999 under the Chairmanship of Prof. H.P.C. Shetty. The following members attended the meeting :

Dr. K. Gopa Kumar, DDG(F), ICAR - Special Guest
Dr. J. R. B. Alfred, Director, ZSI - Member
Dr. V.C. George, Ex.P.S. - Member
Mr. S. Halder, Progressive Farmer - Member
Dr. B.N. Singh, ADG(F), Representative ICAR
Dr. M. Sinha, Director, CIFRI
Mr. R.A. Gupta, - Member Secretary



Research Advisory Committee in session

Quinquennial Review Team

The ICAR has constituted a Quinquennial Review Team (QRT) in November, 1999 to review the work done by the Institute (CIFRI), Barrackpore during the period 1992-97. The composition of the QRT is as follows :

Dr. K. V. Devaraj, Chairman
Dr. C.S. Singh, Member
Prof. N.C. Dutta, Member
Dr. V.D. Singh, Member
Dr. V.C. George, Member
Dr. B.C. Jha, Member Secretary

The committee held its first meeting at CIFRI, Barrackpore on 21st December 1999 to formulate its work programme. Other than the members, Dr. K. Gopa Kumar, DDG (F) and Dr. B.N. Singh, ADG (F), ICAR also attended the meeting.



Members of the QRT discussing a point

STAFF NEWS

OBITUARY

The members of staff of CIFRI express their deep sense of sorrow at the sudden and untimely demise of *Shri S.N. Nan, SSG-II* posted at Barrackpore whose tragic end came on 17th October, 1999.

May the departed soul rest in peace.

OBITUARY

The members of staff of CIFRI express their deep sense of sorrow at the sudden and untimely demise of *Shri Chitta Ranjan Das, T-I-3* posted at Barrackpore whose tragic end came on 29th December 1999.

May the departed soul rest in peace.

Appointment

| | |
|---|------------|
| Sri R.K. Manna, <i>Scientist</i> | 11.11.1999 |
| Sri. Nagesh Kumar Barik, <i>Scientist</i> | 30.11.1999 |
| Sri Ganesh Chandra, <i>Scientist</i> | 24.11.1999 |
| Sri Ritesh Saha, <i>Scientist</i> | 26.11.1999 |
| Sri Satish Kumar, <i>Scientist</i> | 22.11.1999 |
| Sri Arun Kumar Chakraborti, AAO (Deputation) | 20.11.1999 |
| Sri Dileep Kumar, LDC | 1.7.1999 |
| Dr. (Ms.) Ranjana Sinha, T-II-3 | 27.7.1999 |
| Sri Gopal Chandra Roy, SSG-I | 4.12.1999 |
| Sri Anil Kumar, SSG-I | 7.9.1999 |
| Fri Fazal Khan, SSG-I | 10.12.1999 |
| Miss Kalyani Sarkar, SSG-I | 20.12.1999 |
| Sri Manabendra Roy, T-1 | 23.7.1999 |
| Sri Giridhari Paramanick, T-1 | 2.8.1999 |
| Sri T. K. Halder, T-1 | 12.8.1999 |
| Sri Yashwant Singh, SSG-I | 15.11.1999 |
| Sri Roop Narayan Singh, SSG-I | 9.12.1999 |
| Sri Munshi Ram Rana, SSG-I | 13.12.1999 |
| Sri Ravi Kumar Sonkar, SSG-I | 14.12.1999 |
| Sri Mahesh Kumar Meena, SSG-I | 31.12.1999 |

Promotion on recommendation of the Assessment Committee/Departmental Promotion Committee

| | Promoted to | Effective from |
|-------------------------------|-------------|--------------------------|
| Sri S. K. Das, T-5 | T-6 | 1.7.1996 |
| Smt. K. Sucheta Majumder, T-4 | T-5 | 1.7.1997 |
| N.K. Saha, T-2 | T-I-3 | 1.7.1997 |
| Sri Pintu Biswas, T-II-3 | T-4 | 1.1.1997 |
| Sri C.P. Singh, T-I | T-2 | 30.6.1997 (afternoon) |
| Sri S. K. Srivastava, T-4 | T-5 | 1.1.1998 |
| Sri B. K. Biswas, T-4 | T-5 | 1.1.1998 |
| Smt. Keya Saha, T-4 | T-5 | 1.1.1998 |
| Sri D.K. Biswas, T-4 | T-5 | 1.1.1998 |

| | | |
|----------------------------|-----------|--------------------------|
| Smt. K. Jacqueline, T-II-3 | T-4 | 29.4.1998 |
| Sri S. Monoharan, T-4 | T-5 | 4.6.1998 |
| Sri Ramji Tiwari, T-4 | T-5 | 1.1.1999 |
| Sri M.P. Singh, T-4 | T-5 | 1.1.1999 |
| Smt. Subhra Saha, T-2 | T-I-3 | 1.1.1999 |
| Sri S. Bandyopadhyay, T-2 | T-I-3 | 1.7.1999 |
| Sri D. Saha, T-2 | T-I-3 | 1.7.1999 |
| Sri T.K. Kabasi, LDC | Sr. Clerk | 14.7.1999 (afternoon) |
| Sri G.C. Burman, LDC | Sr. Clerk | 14.7.1999 (afternoon) |
| Sri Akchhay Kumar, LDC | Sr. Clerk | 15.7.1999 |
| Sri M.P. Bind, SSG-II | SSG-III | 24.12.1999 |
| Sri V. Mariappan, SSG-II | SSG-III | 28.12.1999 |

The following merit increments(s) were allowed on recommendation of the Assessment committee :

| | No. of Increments | Effective from |
|------------------------|-------------------|----------------|
| Sri A.R. Paul, T-5 | two | 1.7.1996 |
| Sri K.S. Banerjee, T-5 | one | do |
| Sri B.D. Saroj, T-5 | one | do |
| Sri C. Lakra, T-4 | two | 1.7.1997 |
| Sri B.N. Das, T-I-3 | two | 1.1.1999 |
| Sri L.K. Parbat, T-2 | two | 1.7.1997 |
| Sri K.K. Das, T-2 | one | 1.1.1999 |
| Sri H.L. Biswas, T-2 | one | 1.1.1999 |
| Sri A.K. Barui, T-2 | three | 1.1.1999 |

Transfer

| | |
|--------------------------------|--------------------------|
| Sri M. Kachhap, Superintendent | Barrackpore to Vadodara |
| Sri S.K.Das, T-6 | Barrackpore to Allahabad |
| Sri Ashis Chakraborty, T-1 | Guwahati to Barrackpore |

Retirement

| | |
|---------------------------------------|------------|
| Sri M.M. Das, T-I-3 | 31.7.1999 |
| Dr. D. K. De, <i>Senior Scientist</i> | 31.12.1999 |

