



The Inland Fisheries News

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Decline in fisheries of River Brahmaputra : An ecological study

Changes in Water quality

The water quality parameters like pH, dissolved oxygen, alkalinity, conductance, total dissolved solids, calcium, hardness and nutrients did not show much variations over the years. However, a significant reduction was observed in clarity of water. The water transparency which was as high as 150 cm during 1974 has been reduced to 30 to 40 cm during 1997-98 which is a clear indication of increasing silt load in the river.

Investigations conducted by scientists of CIFRI during the last five years revealed interesting facts on the ecology and fisheries of the Brahmaputra river system and its tributaries. The disturbing indication from the study was the decline in fish production.

every year, specially by those on the north bank. No significant variation in the water quality parameters of the main river over the years also indicate that there is practically no qualitative degradation in the tributaries as far as the hydrodynamics is concerned.

Changes in the fisheries structure

The fish landings from Siang, Dibang and Lohit at various centres were mainly dominated by Mahseer species *Tor putitora* and *Neolisochilus hexagonolepis*. Coldwater species *L. dero* and *L. dyocheilus* and trout *Scizothorax richardsoni* (80 to 90% of the catch). Even at Saidiya, the confluence point of the three tributaries, the main catch was represented by the above species (64%) although the miscellaneous species (22%) and catfishes (14.5%) also contributed significantly to the total catch. But from Dibrugarh to Dhubri mahseer and other coldwater species disappeared completely from the catches, the main contributors being major carp, catfishes, minor carps and miscellaneous species.

The qualitative picture of the fish catches at various landing centres between Dibrugarh and Dhubri has shown considerable variations over the years. During seventies the landings in the entire stretch showed comparatively higher contribution of major carps, catfishes and minor carps and less contribution by miscellaneous species. But with passage of time there has been considerable decline in the percentage contribution of major carps, catfishes and minor carps while the



Increasing silt load of River Brahmaputra

The tributaries play a key role in maintaining the annual water quality cycle of river Brahmaputra and increase of turbidity over the years clearly reflect the vast quantity of silt discharge in the river by these tributaries

miscellaneous species have shown remarkable increase. In fact 50 to 60% of the total catch presently is of the miscellaneous group.



Captured mahseer (*Neolisochilus hexagonolepis*)
from River Brahmaputra

Fisheries of the important tributaries like Jia Bharali, Subansiri, Manas have shown very interesting picture. These tributaries are famous for Mahseer angling and are a good attraction for tourists. Infact 80 to 90% of the total catches from the upper stretches of these tributaries are represented by species like *Tor putitora*, *Neolisochilus hexagonolepis*, *L. dero* and *L. dyocheilus*. But interestingly the fish landings from the down stretches of the above tributaries towards their confluence with Brahmaputra have not shown any significant contribution by the above mentioned species and almost entire catch was mainly comprised of major carps, catfishes, minor carps, miscellaneous species and prawns. The existence of two tier fisheries in these tributaries is a clear indication of the presence of some kind of natural barrier which is not allowing the upstream fishes to migrate the down stretch and entire Brahmaputra and vice-versa.

Factors responsible for decline in fisheries.

Heavy siltation and loss of breeding grounds

The problem of soil erosion is very acute in the north bank due to heavy deforestation in Arunachal Pradesh and Bhutan foot hills and the general topography of the land with 3-5% slope towards Brahmaputra valley. As a result the tributaries carry and discharge vast amount of silt in the main river. Observations have shown that north bank tributaries have the average silt discharge in the order of $666.7 \text{ m}^3\text{km}^{-2}$ and the silt discharge from southern part ranges between 66.7 to $95.7 \text{ m}^3\text{km}^{-2}$. Due to accumulation of silt the Brahmaputra river bed is rising alarmingly. The siltation has become such a serious problem that many tributaries often change their course. Heavy siltation and loss of breeding ground is one of the major factors responsible for decline in fisheries of river Brahmaputra and its tributaries.

Mass scale destruction of juveniles

Heavy exploitation of spawners (Ujaimara fishing) during breeding season and subsequent fishing of juveniles cause maximum damage to the natural recruitment process. The landing pattern have shown maximum fish catch from the river during September-October (almost 60% of the annual catch). Maximum catch recorded during these months is due to large scale fishing of carp juveniles (70 to 80%). Mass destruction of juveniles results in failure of recruitment of the quality fishes and ultimately decline in the overall fishery of the river.

Habitat destruction in flood plain lakes

Beels are an integral part of the river system and during the process of inundation serve as vital spawning ground for major carps because the easily accessible shallow areas of these lakes provide optimum breeding conditions. Of late the developmental activities in the river basin, indiscriminate and unscientific construction of sluice gates as well as excessive siltation of connecting channels have led to severing link with the main stream. As a result this natural breeding source is gradually being lost.



Miscellaneous fish species from River Brahmaputra



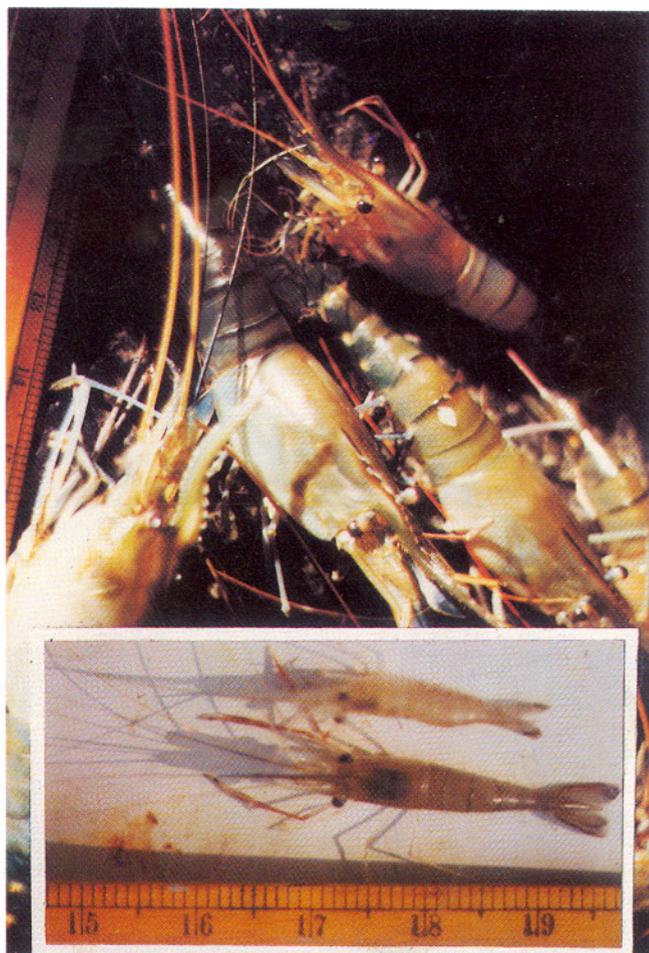
Habitat improvement for fishes in the Gangetic stretch near Kanpur

The fish landings from river Ganga around Kanpur witnessed drastic change in fish species composition during the past two decades. Indian major carps the major contributor of Gangetic fish landings have been replaced by uneconomical minor carps, minnows and catfishes in the riverine catch of Kanpur vicinity. The river water in the region, contaminated by industries and city sewage prior to implementation of the Ganga Action Plan is in the process of regaining normalcy. Recently a monsoon survey on riverine seed abundance carried out by a team of investigators from the CIFRI centre at Allahabad observed spawn of Indian major carps dominated by *Cirrhinus mrigala* and *Labeo rohita* in shooting net samples at Kanpur and 30-40 km up and down stream of the city. This is an indication of environmental improvement in river Ganga and revival of population recruitment of Indian major carps near Kanpur after the adoption of abatement measures against industrial and city sewage contamination.

Abundance of commercially important giant freshwater prawn *Macrobrachium rosenbergii* (De Man) in the lower zone of Hooghly-Matlah estuarine system

Giant freshwater prawn, *Macrobrachium rosenbergii* contributes to a fairly good fishery in the freshwater zone of Hooghly estuarine system. The range of down stream migration of the species during pre-Farakka barrage period was upto Noorpur (1.90 to 21.2 ppt salinity) or Uluberia (0.50 to 9.45 ppt salinity) located 83 and 113 km upstream respectively from the estuary mouth. Investigation conducted by the scientists of the Institute revealed that the species now migrates further downstream towards sea face as far as Diamond Harbour, Kakdwip, Namkhana, Sonakhali, Basanti, Jharkhali, Nazat, Hasnabad areas of the Hooghly-Matlah estuarine system indicating a long range of migration. The migration of berried females in particular, takes place in the water bodies (2.30 to 19.00 ppt salinity) of Sundarbans usually early in March/April and continues up to July. This down stream migration is associated with

spawning activity of the species and the peak breeding is observed during June and July. It is also observed that the Hooghly-Matlah estuarine system of the Sundarbans, criss-crossed by numerous creeks and channels, is potentially rich in *M. rosenbergii* fishery which was not observed earlier. The probable reason for the extended down stream migration of the species during post Farakka barrage period is the reduction in salinity due to increased freshwater discharge into the system. With the popularity of *M. rosenbergii* culture in the coastal



Adult and juvenile *Macrobrachium rosenbergii* from Hooghly-Matlah estuarine system

areas increasing, many seed collection centres for *M. rosenbergii* in the lower estuarine areas have been identified and two recognised *M. rosenbergii* seed markets have also been identified at Sonakhali and at Hasnabad. A good number of fishermen from Sundarbans have already started the culture of this giant freshwater prawn in association with other compatible brackishwater prawn and fish species for a better margin of profit.

Research on the breeding of ornamental fish at CIFRI

Ornamental fish trade of the world is worth \$ 600 million. Netherlands and Japan are the main importers with 40 tonnes per week and 50 tonnes per year respectively. At present India has a meagre share of only Rs.0.5 million in the \$ 600 million affair of this world trade though Asian countries are the major exporters of the fishes contributing 60% of the world production. India has a great potential in ornamental fish trade with 200 species of colourful ornamental fishes in her water bodies. Taking into consideration the potential of the vast resources available, CIFRI, Barrackpore has decided to tap this resource from the floodplain wetlands of West Bengal.

Since breeding of the ornamental fishes is the main constraint in India, CIFRI started a project to explore the possibilities of breeding of these fishes. The fishes taken up for breeding experiments are, *Ambassis nama*, *A. ranga*, *Colisa fasciata*, *Aplocheilus panchax*, *Puntius spp.*, *Badis badis* and *Notopterus spp.* The work is in progress.

HUMAN RESOURCE DEVELOPMENT

Training-cum-Workshop



Participants presenting their experience in the workshop

A 2-day Training cum Workshop on **Prawn Farming** for the Extension Functionaries of the State Fisheries Department, West Bengal was organised at the

Institute's Headquarters, Barrackpore during July 8-9, 1998. The programme was designed to assess the impact of an earlier training organised during June 6-16, 1995 for the same trainees who participated in this workshop. The participants presented their past-training experiences in the Workshop session. In the Training Session they were appraised of the latest developments in the field.

Short Course on Methods for Diagnosis and Treatment of Fish Disease at CIFRI, Barrackpore



Participants on a field visit to a fish farm

A short course on **Methods for Diagnosis and Treatment of Fish Disease** was organised by CIFRI at Barrackpore from 15-24 July 1998. The 30 participants selected were scientists, lecturers, associate professors, research scholars and development officers representing SAUs, ICAR Institutes, NABARD, ZSI, State Fisheries Departments and conventional Universities. The participants had exposure to the various fish diseases prevalent in India, their symptoms, aetiology, identification and treatment methods through a series of lectures. Ten hectic days of study and sharing of knowledge enriched the participants as well as the resource persons. During the course the participants made full use of the rich collection of books and other facilities in the CIFRI Library and greatly enriched their literature collection on various aspects of fisheries. A very attractive compilation of the lecture notes of this Short Course was given to the participants along with other course materials and certificate.

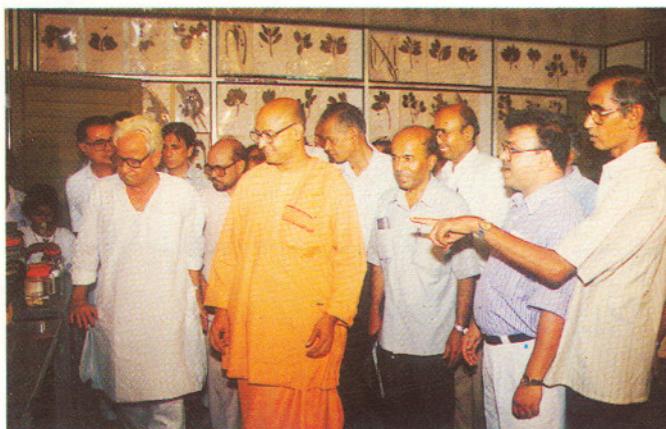
National Training Programme

A 8-day National Training course was organised at the Institute Headquarters during November 10-17, 1998 on 'Management of fisheries in open water systems and extension methods' which was sponsored by the Directorate of Extension, Ministry of Agriculture, Govt. Of India. A total of 22 Senior Officers of various State Fisheries Departments participated in the above training course.



A participant presenting his flip chart in the Training course

Celebration of 'Sundarbans Day' and establishment of 'Mangrove Museum'



Delegates viewing the exhibits in the Mangrove Ecological Museum

'The Sundarbans Day' was observed at the Central Inland Capture Fisheries Research Station, Salt Lake, Calcutta. On this occasion a Mangrove Ecological Museum on Sundarbans was inaugurated by Swami Viswamayananda of Ramkrishna Mission Ashram, Narendrapur. The museum displays more than 1000

colour photographs, 100 sketches/drawings of plants, algae and fish species and also about a thousand collected plant (Herbarium) and animal (wet preserved) samples. The museum is the outcome of the research effort by scientists of CIFRI under the various research programmes.

EXTENSION SCENE

KVK Activities

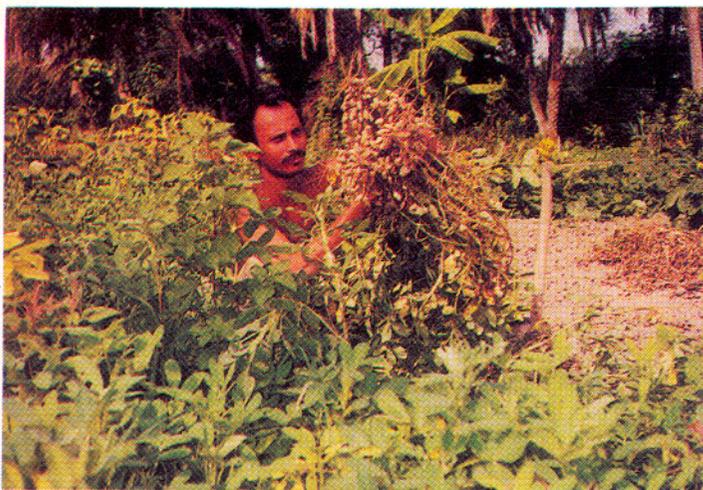
Krishi Vigyan Kendra, Kakdwip conducted the following training programmes during July-December 1998

Training	No. of courses	Beneficiaries
1. Fishery	On campus - 6 Off campus - 10	60 355
2. Crop science	On campus - 6 Off campus - 9	60 355
3. Horticulture	On campus - 5 Off campus - 8	50 208
4. Animal science	On campus - 5 Off campus - 8	50 215
5. Home science	On campus - 5 Off campus - 9	50 184

Backyard Poultry under On-Farm Trial Programme

Chicks of Rhode Island Red (RIR) breed were distributed among 20 Krishi Vigyan Kendra, Kakdwip adopted farm families under On-Farm Trial Programme. The programme was undertaken for improving the lot of local villagers through partial range rearing and to observe its performance in humid tropical coastal area utilizing locally available agro-byproduct. It is observed that the birds are performing well in coastal villages of lower Sundarbans.

Groundnut cultivation in Sundarban area



A good crop of groundnut

Krishi Vigyan Kendra, Kakdwip is encouraging the farmers of its adopted area for cultivation of improved variety of groundnut. The farmers obtained optimum production of average 8 q ha⁻¹. It will open another avenue of earning for the farmers in this difficult saline tract of Sundarbans.

Consultancy assignment to CIFRI under the World Bank Assisted Fish & Shrimp Culture Project

Monitoring Inland Fisheries Component

CIFRI has been assigned the task of monitoring the Inland Fisheries Component of the World Bank assisted shrimp and fish culture project. The Inland Fisheries Component of the project covers 91 reservoirs and 34 oxbow lakes in the states of Andhra Pradesh, Orissa, Uttar Pradesh and Bihar. The Inception Report and the First Interim Report has already been submitted.

Environmental Impact Assessment

CIFRI has also been assigned to conduct a comprehensive ecological survey of the 37 oxbow lakes covered under the World Bank assisted project in Uttar Pradesh and Bihar. This will enable collection of baseline data for assessing the possible negative and positive environmental impacts of the fisheries development projects and to prepare monitoring protocol and environmental management plan specific to each or group of ecosystems. The First Interim Report of the project has been submitted.

MEETINGS

Management Committee Meeting held on 22nd December 1998

Institute Staff Joint Council Meeting held on 28th November 1998

STAFF NEWS

Training

Dr. Sanjib Kumar Manna, Scientist (Veterinary Microbiology) of CIFRI is deputed for attending 65th FOCARS Training Programme conducted by NAARM, Hyderabad during the period 07.10.1998 to 06.02.1999.

Joint Staff Council Election

Election were held on 18th December 1998 for Institute Joint Staff Council. The following officials have been elected -

Technical Category : Shri Dipankar Chatterjee, T-I-3 and Shri H. Chaklader, T-5.

Administrative Category : Shri T.K. Majumder, Assistant & Shri Pabitra Lahiri, Assistant.

Supporting Category : Shri A.L. Yadav, SSG.III, Shri H.K. Burman, SSG.III and Shri K.K. Dhir, SSG.II.

OBITUARY

The members of the staff of the CIFRI express their deep sense of sorrow at the sudden and untimely demise of *Shri Swapan Kumar Chatterjee, T-4* posted at Salt Lake, Calcutta whose tragic end came on 31st December 1998.

May the departed soul rest in peace.

ICAR Zonal Sports Meet



Shri M. Roy receiving the best athlete award



CIFRI sportsmen gave an outstanding performance in the ICAR sports meet held at IVRI, Bareilly during 3-6 November, 1998. They bagged 12 gold and 3 silver medals. Shri M. Roy of CIFRI was again adjudged the best athlete of Zone I.

Appointment

Dr. V.V. Sugunan, Principal Scientist (F. & F.Sc.)	2.11.1998(FN)
Dr.M. Ramakrishnaiah, Pr. Scientist (F. & F.Sc.)	3.11.1998(FN)
Dr. Balbir Singh, Pr. Scientist (F. & F.Sc.)	5.11.1998(AN)
Dr. Krishna Chandra, Pr. Scientist (Agril.Chem.)	18.11.1998(FN)
Dr. R.L. Sagar, Pr. Scientist (Agril. Extn.)	30.11.1998(FN)
Dr. P.K. Saha, Pr. Scientist (Soil Sc.)	2.12.1998(AN)

Promotion

Smt. Anjali De	T-6	01.07.1995
Smt. Sukla Das	T-6	01.01.1998
Shri R.C. Singh	T-6	01.07.1995
Shri T.S. Rama Raju	T-6	01.07.1995
Shri Gautam Pathak	T-6	01.07.1995
Shri P.K. Ghosh	T-6	01.07.1996
Shri G. Lahiri	Sr. P.A.	06.11.1998
Shru U.K. Ghosh	Sr.P.A.	11.11.1998
Shri Ranjit Kumar Ghosh	A. F. & A. O.	06.11.1998
Shri S.K. Sadhukhan	T-6	01.07.1991
Shri C.C. Das	AAO	14.12.1998
Shri M.L. Biswas	Assistant	11.11.1998
Shri P.K. Ghosh	Senior Clerk	06.11.1998
Smt. Jayasri Pal	Senior Clerk	06.11.1998

Smt. Geeti Majumder	Senior Clerk	07.11.1998
Shri Sukumar Sarkar	Senior Clerk	11.11.1998
Smt. Swapna Chattopadhyay	Senior Clerk	06.11.1998
Shri Malay Kumar Joardar	Senior Clerk	06.11.1998
Shri C.K. Pandey	Senior Clerk	06.11.1998
Shri Paras Ram	Senior Clerk	11.11.1998
Smt. S. Sumithra Devi	Senior Clerk	10.11.1998
Shri Santosh Sarkar	Senior Clerk	11.11.1998
Shri C.D. Parmar	Senior Clerk	10.11.1998
Shri L. Somulu	SSG-IV	16.11.1998
Shri Rajdhari Mallah	SSG-III	13.11.1998
Shri Lalita Prasad	SSG-III	11.11.1998
Shri B.C. Das	SSG-III	11.11.1998
Shri Laxmi Ram	SSG-III	06.11.1998
Shri N. Deka	SSG-II	11.11.1998
Shri Dalbir Singh	SSG-II	11.11.1998
Shri R.D. Chaudhary	SSG-II	11.11.1998
Shri M.L. Sarkar	SSG-II	06.11.1998
Shri Paramjit Singh	SSG-II	16.11.1998
Shri M. Pennappa	SSG-II	10.11.1998
Shri R. Rajendran	SSG-II	16.11.1998

Transfer

Dr. Amitabha Ghosh, Senior Scientist	Malda to Calcutta
Md. Aftabuddin, Scientist	Barrackpore to Guwahati
Shri Keshaw Prasad, Supdt.	Allahabad to Barrackpore
Shri H.L. Biswas, T-2	Barrackpore to Calcutta
Shri A.K. Goswami, Driver (T-I)	Barrackpore to Kakdwip
Shri Santosh Sarkar, Junior Clerk	Malda to Barrackpore
Shri Nagendra Rajak, SSG-II	Allahabad to Barrackpore
Shri Umesh Chaudhary, SSG-II	Allahabad to Barrackpore
Shri Swapan Gayen, SSG-II	Calcutta to Barrackpore
Shri Satya Prakash, SSG-I	Karnal to CIRG, Mathura (Inter-Institutional Transfer)

Retirement

Shri P. Sayalu, SSG-IV (Voluntarily)	01.10.1998
Shri Ram Sundar, SSG-III	31.10.1998
Shri P.K. Pandit, Senior Scientist	30.11.1998
Shri Sita Ram Nishad, SSG-III	31.12.1998

Just Published

The Ganga - Environment & Fishery

M. Sinha, D.K. De and B.C. Jha

Price : Rs.300/- US \$ 15.00

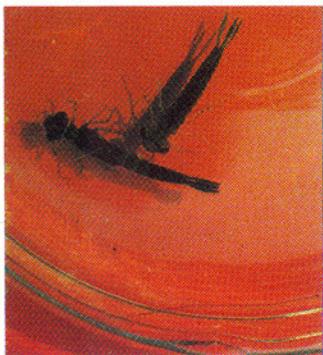
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Dragonfly and Damselfly

These are brightly coloured insects and belong to the order Odonata. True dragon flies have a very long slender colourful body, two prominent eyes and four large elaborately veined, dissimilar wings which usually remain spread while resting. The two huge protruding eyes though giving the insect a clear sight add some fierceness to its look and hence the name Dragonfly. Damselfly is also a kind of small dragonfly with two pairs of smaller wings which usually remain folded while resting. It has a much more slender body and are so called in an allusion to a slim maid.



Damselfly nymph



Dragonfly nymph

These insects are found in most parts of the world, but are very common in the tropics and can be seen flitting about around water bodies during summer. They are probably the fastest among the insects and can fly at speed up to 100 km hr^{-1} while darting their prey-Gnats and insects in the mid air, they hold their six legs to form a basket under their head to trap the prey and eat them in the flight. They are in turn preyed upon by other insects, spiders, frogs, fishes and aquatic birds. Dragonflies mate in the air and the female lay an average of 200-300 eggs in or around water. The dragonfly nymphs breathe through rectal gills while damselfly nymphs do it through caudal lamellae. They usually act as a predator of spawn and fish food organisms in nursery pond.

FIRST ANNOUNCEMENT

NATIONAL SEMINAR On ECO-FRIENDLY EXPLOITATION OF RESOURCES FOR DOUBLING FISH PRODUCTION - STRATEGIES FOR 21ST CENTURY.

DECEMBER 8-9, 1999

ORGANISED BY
INLAND FISHERIES SOCIETY OF INDIA,
BARRACKPORE, WEST BENGAL
&
CIFRI, BARRACKPORE

VENUE
CENTRAL INLAND CAPTURE FISHERIES
RESEARCH INSTITUTE,
CAMPUS BARRACKPORE-743101, CALCUTTA,
WEST BENGAL

LIBRARY

New Additions (Books)

Current and emerging trends in aquaculture by Thomas, P.C. ed.
Environmental science. The way the world works by Nebel, Bernard J., Richard T. Wright.
Basin Sub-basin Inventory of water pollution : The Ganga Basin Part II (Excluding the Yamuna Sub-basin) by Das Gupta, S.P.
Changing perspectives of Inland Fisheries by Vass, K.K. & M. Sinha.
Wetlands of India - Ecology and threats. Vol. I : The ecology and the exploitation of typical south Indian wetlands by Abbasi, S.A.
Wetlands of India - Ecology and threats. Vol. II : Asia's largest lake (Chilka) Ecology Threats and Imperatives by Abbasi, S.A. & Prafulla Kumar Mishra.
Wetlands of India - Ecology and threats. Vol. III : The wetlands of Kerala by Abbasi, S.A. & Naseema Abbasi.

To be contd... ↗

From the Editors' desk

Dear reader, at the very outset the CIFRI family wishes you a very happy and fruitful 1999. The parting year had been quite encouraging as far as fisheries research and development is concerned. In coming years, it is felt that our concern should be raised towards water abstraction from the rivers where a minimum volume should be maintained for sustaining and conserving the fish germ plasm and other biodiversity. Moreover, the need is also felt for developing and standardizing biomonitoring techniques for our riverine system as chemical monitoring alone is not sufficient for understanding the health status of fish population. CIFRI has already initiated research in this direction and the results are forthcoming. The book entitled "**The Ganga - Environment & Fishery**" recently published by the Institute is a step in this direction.

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