The Inland Fisheries News

Newsletter of the Central Inland Fisheries Research Institute

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Fisheries of Hooghly-Matlah estuary

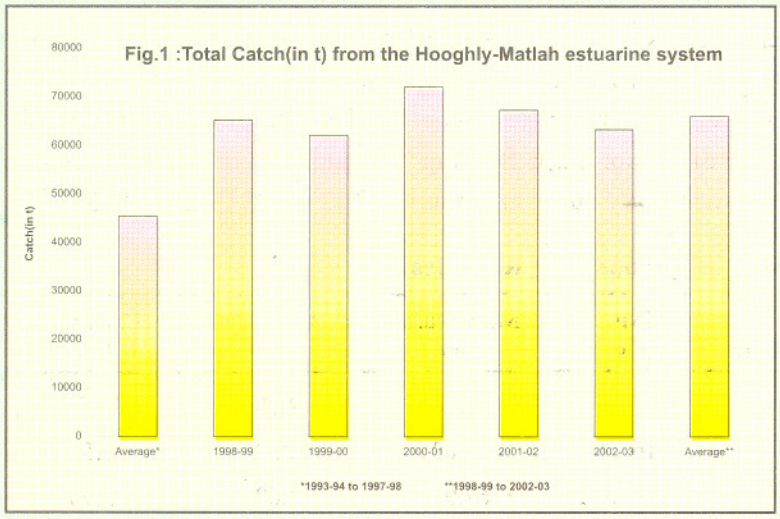
The estimated total catch from the Hooghly-Matlah estuarine system have shown an increasing trend bringing cheer to fishers and consumers.

Scientists of the Estuarine Division of CIFRI report that the estimated total annual fish yield from this estuarine system fluctuated from 62165.4 to 72098.7 t during the period 1998-99 to 2002-03 with an average catch of 66027.0 t per year. The hike in total catch during the year 2000-01 was mainly due to increase in catch (59% higher than previous year) due to increased landings of a number of species viz. Hilsa, *Sciaena biauritus, Pama pama, Pampus argenteus* and prawns. The decline in total catches during 1999-00 and 2002-03 were due to considerable fall of catches of Hilsa and winter migratory bag net fishery.

In the total catch from 1998-99 to 2002-03, the dominant groups were the Clupieds 23.3-31.6% (av. 29.4%), Bombay duck 12.7-19.8% (av.16.4%), Sciaenids 12.2-15.7% (av.14.3%), Ribbon fishes 5.9-8.5% (av.7.5%), Prawns 4.2-7.3% (av.6.0%), Cat fishes 5.7-6.3% (av.5.9%), Polynemids 0.7-0.8% (av.0.8%).

The estimated total catch from the Hooghly-Matlah estuarine system showed an increasing trend over the years. The fishing effort of the estuary also rapidly increased year after year owing to mechanization of fishing vessels and modernization of other fishing infrastructures. Thus, it is necessary to study as to how long the estuary can provide sustainable fish yield. Time series data on total catch from 1993-94 to 2002-03 have been used to obtain the maximum catchable potential yield (Algaraja, 1984). The maximum catchable potential yield, Cmax value was worked out as 67,855.1 t. The average catch during the last five years is also, to some extent, of the same order (66,027 t).

During the period from 1998-99 to 2002-03, Hooghly estuarine system was found to achieve an annual average growth rate of 36.1% when average annual catch (67,027 t) was compared with the average catch (45,524.4 t) of previous 5 years period (from 1993-94 to 1997-98). This significant sign of increase of catch over the years is due to rapid motorization of fishing vessels and modernization of other fishing infrastructures. As the average yield (67,027 t) was observed to be close and within the domain of Maximum Sustainable Yield (MSY : 67,855.1 t), the effort level should be kept fixed at the present level of exploitation to get sustainable yield from this estuarine system for a long period. If more fishing pressure is exerted, the estuarine system may lose its sustainability and may lead to decline in fishery to uneconomic level.



Assessment of fish catch composition of River Beas

Recent assessment of fish composition of River Beas by scientists of CIFRI, showed establishment of the exotic species *C. carpio* in the river.

The overall composition of various groups in the total fish population of river Beas showed that the miscellaneous group represented by murrels, *N. notopterus*, *B. bagarius*, *Oxygaster* sp. and eels were dominant, forming 30.54% of the total population. Common carp formed the next highest group constituting 29.85% of the total population. Its presence throughout the river depict its establishment within the system.

Indian major carp and large catfishes represented 21.58% and 9.06% of the total population respectively. Mahseer *(T. putitora)* forming 0.13% of total population within the river was present between Mukerian to Pathankot mainly, where its contribution ranged between 1.25 to 0.78% respectively.

Minor carp represented mostly by *L. dero*, *L. dyocheilus*, *L. bata*, *L. gonius* and *C. reba* formed 8.97% of total population.

Talwara station had dominance of common carp (59.74%) mainly due to the conducive environment i.e. the lentic nature of river formed by existence of barrage at this site and induction of common carp seed in Pong reservoir by the fisheries department of Himachal Pradesh. Mukerian which is a purely plain area having lotic environment, the population was almost equally represented by all groups barring common carp. Pathankot had dominance of minor carps forming 67.97% of total population at the site mainly due to environs of catchment area; foot-hills of Siwalik Himalayas where this fishery exists in abundance. Amritsar to Harike has dominance of major carps, 33.74-17.55%, miscellaneous group mainly *Notopterus* sp., *murrels* and common carps, 20.41-39.27% and catfishes were also present sufficiently.

The percentage composition of various species within IMC from the total biomass of the river showed that *C. mrigala* (9.72%) and *L. rohita* (8.81%) were fairly present throughout except at Talwara. *C. catla* forming 2.48% of population was present in down stream from Sultanpur to Harike and rarely at Amritsar. Large sized catfish population was formed by *W. attu*, 5.88%; *M. seenghala* 2.14% and *M. aor* 1.04%.

The dominant species at various centre were *Cyprinus carpio* 59.74%, *L. dero* and *C. reba* 7.9% each at Talwara, *L. dero* and *M. aor* 14.16% and *C. mrigala* (9.01%) at Mukerian, *L. bata* 32.03%, *L. dero* 18% and *L. dyocheilus* 14.84% at Pathankot; *C. carpio* 46.45%, *C. mrigala* 13.66%, *L. rohita* 10.98% and *W. attu* 10.04% at Amritsar; *C. carpio* 39.27%, *L. rohita* 16.16% and *C. mrigala* 15.33% at Harike; *C. carpio* 20.41%, *murrels* 10.02% and *C. mrigala* 7.44% at Sultanpur. The fish produce from Kalibein at Sultanpur was mainly composed of *C. carpio* 30.46%, *murrels* 9.84%, *L. rohita* 9.12% and *C. catla* 8.15%.

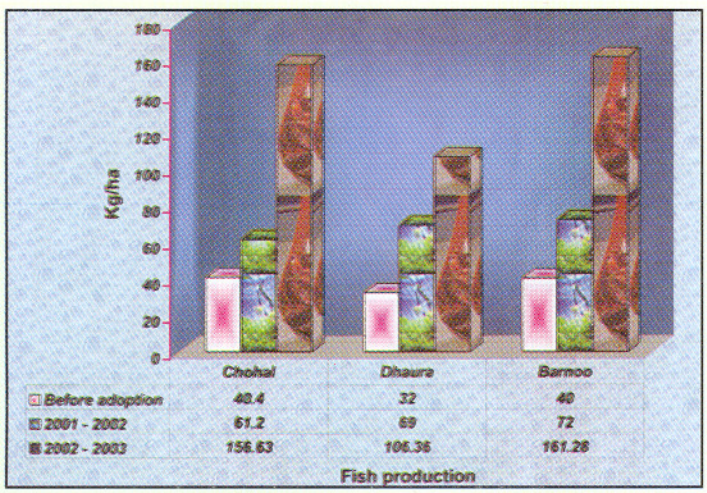
Percentage composition of various fish groups along River Beas

Station	Total landing (t/m)	IMC (%)	Minor carp (%)	Catfish (%)	*C. carpio* (%)	Misc. (%)	*Tor* sp. (%)
Talwara	0.77	-	22.8	2.60	59.74	15.58	-
Mukerian	2.33	16.74	32.62	23.18	2.58	23.60	1.28
Pathankot	1.28	0.78	67.97	4.69	3.90	21.88	0.78
Amritsar	7.47	25.17	2.28	10.84	46.45	15.26	-
Harike	4.89	33.74	7.77	6.54	39.27	12.68	-
Sultanpur	10.88	17.55	4.60	7.26	20.41	50.18	-
Sultanpur (Kalibein)	4.17	24.46	-	8.15	30.46	36.93	-

Success of stock enhancement measures in Reservoirs

Investigations conducted under NATP project 'Fisheries Management in lentic water system' in 3 reservoirs gives encouraging production increase.

Under National Agricultural Technology Project an investigation on "Fisheries management in the lentic water system; stocking of reservoir with fish seed" was initiated in 2000-2001. The project was implemented through three Co-operating Centres viz. G.B. Panth University Agriculture & Technology, Pantnagar, Jawaharlal Nehru Krishi Vidyalaya, Jabalpur and Panjab Agricultural University, Ludhiana. Under the project three reservoirs was selected viz. Chohal reservoir (61 ha) at PAU, Dhaura reservoir (1200 ha) at



GBPUAT and Barnoo reseroir (75.6 ha) at JNKVV. The morphometric, hydrological, biotic investigations was made which revealed that the reservoirs were productive. The reservoirs were stocked with fish seed produced by the Co-operating centres at stocking density of 520 nos./ha, 413 nos./ha, and 500 nos./ha in Chohal, Dhaura and Barnoo reservoirs respectively. The production potential of the reservoirs were estimated at 127.63 kg/ha, 129.22 kg/ha and 109 kg/ha in Dhaura, Chohal and Barnoo respectively. The production obtained after the three year period of investigation were 161.28 kg/ha against base production of 40 kg/ha in Barnoo, 106.36 kg/ha against 32 kg/ha in Dhaura and 156.63 kg/ha against 23 kg/ha in Chohal reservoir. The project terminated in November, 2003.

Raising Stocking Material of Priced Minor Carps in *Beels* through Cage Rearing

Unlike major carps, fisheries of minor carps in India have not received enough attention. Species like *Labeo gonius* of this group possess better taste, faster growth potential and good market demand than other minor carps.Since their natural stock in open waters like beels (ox-bow lakes) in West Bengal is not sufficient enough to sustain stable fishery, their enhancement through stocking at the right size of 10 cm length has been planned. However, availability of their seeds at this size in sufficient quantity is difficult and expensive for fishers. Scientist of the Floodplain Wetland Division initiated experiments in a beel in West Bengal to rear the early fingerlings of Labeo gonius in low cost floating net cages, until they reach stockable size.

Four double walled cages were fabricated using HDPE net material. The outer cages of these (3.5 x 1.8 x 1.8 m each) were made of 1 cm mesh net and their inner (2 x 1 x 1 m each) were of 2 mm mesh. The cages were fitted on a rectangular bamboo frame (9 x 4.5 m) kept afloat using six, empty, sealed plastic drums (2 00 l). The net cages were fitted with burnt earthen sinkers, at the bottom, to keep them in shape. On September, 2003, these cages were stocked with early fingerlings of *Labeo gonius* at an average size of 4.0 cm long weighing 0.64 g at densities @ 10 and 20 cu m^{-1} in two replications. After rearing for a period of ninety days, the *Labeo gonius* seeds registered the average length and weight increments of 6.7 cm and 15.0 gm, 5.9 cm and 12.0 gm at the stocking density levels of 10 nos/cu.m. and 20 nos/cu.m. respectively. In both the experiments, the reared fish seeds attained the targeted average increase in length (10.9 cm and 10 cm), by subsisting only on the available natural foods of the oxbow lake.

Early fingerlings of Labeo gonius being released into the net cages

Deep pools – pumping life to fishery of peninsular rivers

Scientists of CIFRI conducted investigations on the unique ecosystem the deep pools of the peninsular rivers of India in relation to their fishery.

Deep pool	River system	Depth (m)	Length (km)	Width (m)
L'madugu	Godavari	10-12	5.0	700-800
Muduthere	Cauvery	6-8	5.0	600-800
Satrasala	Krishna	16-18	10.0	450-500
Taduvouy	Krishna	6-8	8.0-10.0	750-800

Limno-chemical investigations revealed that the deep pool character was reflected more in sediment than in water as to settle nutrients being loaded from upstreams. Much higher total alkalinity and plankton density were special characteristics of such deep pools. Abundance of fish species *like C. reba, P. carnaticus, P. dubius, L. bata, L. calbasu, L. ariza, L. baga,* L. kontius and L. nukta were encountered in gorge hilly fish sanctuaries. Muduthere represented altogether different fishery structure unlike the main stream of Cauvery with abundance of large-sized major carps, grass carps and common carps. Besides these, *M. rosenbergii*, eels and murrels of bigger size were also abundant. Development of such pools at Muduthere and Mekedatu gorge area for conservation of endemic species like Puntius dubius, P. carnaticus, Labeo fimbriatus etc. are suggested. Fish species available in Lanjanmadugu were big-sized murrels, *M. malcolmsonii, L. rohita, L. calbasu, C. mrigala, C. catla, Mastacembelus armatus, Mystus punctatus,* and *Aorichthes* spp. etc. In Satrasala, *C. catla, L. rohita, P. kolus, L. calbasu,* true eels, *Rita pavimentata, A. seenghala, M. malcolmsonii, Etroplus suratensis* and *Notopterus notopterus* were dominant in the catch while in Taduvouy, *C. catla, L. rohita, P. kolus, L. fimbriatus, A. seenghala, Channa* spp., *G. giuris, E. suratensis, Xenentedon cancilla* and prawns were dominant in the catch structure. *Puntius jerdonii* (*P. pulchelus*) is another important endangered species of Krishna which is to be conserved immediately.

Salient sediment characteristics

Parameters of deep pool	PH	Org. C (%)	Total – N (%)	C/N Ratio	Avail.-N (mg/100 g)	Avail.-P (mg/100 g)
L'Madugu	7.6	0.45	0.06	8.80	14.50	0.39
Maduthere	7.6	0.98	0.05	19.60	38.80	3.50
Satrsala	7.4	3.13	0.39	9.30	75.65	4.58
Taduvouy	7.5	1.91	0.06	44.60	21.60	4.35

Rapid detection of shellfish pathogens using DNA probe and hybridization technique

Vibriosis and white spot diseases of prawn is a major area of concern for fish health workers. Scientists of theFish Health and Environment Division of CIFRI are using molecular technique like PCR and also newer methodologies for correct diagnosis of pathogens considering the possible contamination of reagents and PCR mix with inhibitory substances leading to false positive and false negative reactions in PCR. In this regard PCR amplified DNA probes have been developed both for *V. parahaemolyticus* and WSSV and samples are screened using "Dot blot hybridization" Enhanced Chemiluminescent (ECL) technique.

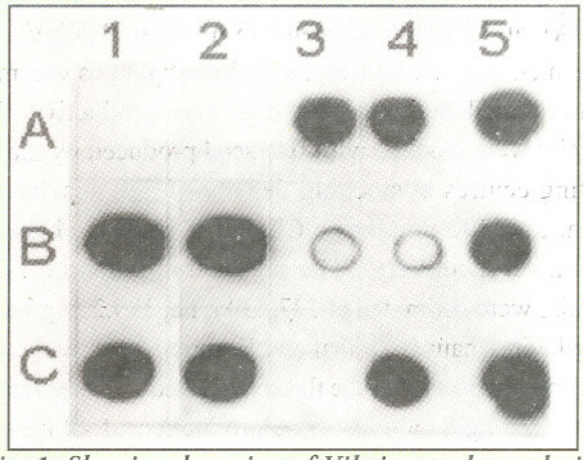


Fig. 1 Showing detection of Vibrio parahaemolyticus in prawn samples using DNA-Dot-blot hybridization technique. Development of clear dark spots indicate the samples to be positive.

DNA dot-blot hybridization is useful in detection of microbial pathogens when present in low numbers. Samples which are confused in PCR amplification, can also be detected using this method. The sensitivity of this technique has been shown to be almost same as ELISA and the total amount of DNA detected varies from 0.01 ng to 1.0 ng. DNA hybridization technique has been used to detect a variety of human and animal pathogens. The test has wide scope of application in fish and shellfish disease diagnosis.

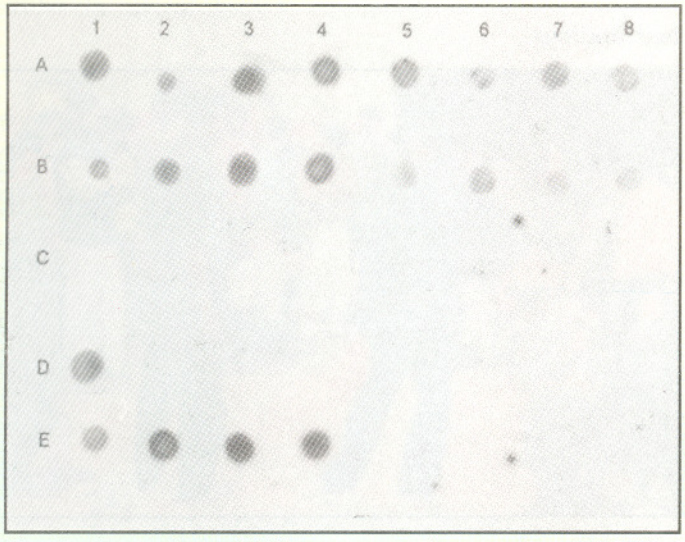


Fig. 2. Detection of White spot syndrome virus (VSSV) in tissue samples using DNA-Dot-blot hybridization technique using WSSV specific DNA probe.

Meetings/Seminars

Summer School on 'Fisheries Management of Floodplain Wetlands in India'

A Summer School on "Fisheries Management of Floodplain Wetlands in India" was conducted from 18th July to 16th August, 2003 at CIFRI Barrackpore. The Summer School was inaugurated by Dr. S.N. Dwivedi, Ex-Director, CIFE with Dr. M. Sinha and Dr. P. Das as Guests of Honour. In his inaugural address Dr. Dwivedi highlighted the important role played by the floodplain wetlands in uplifting the rural economy of India especially in the North and Northeastern parts of the country. The month long Summer School was attended by 25 participants from all over the country. The Summer School covered management, production function and socio-economic aspects of wetlands fishery through lectures, laboratory classes and field trips.

Inaugural session of the Summer School in progress

Final Workshop under NATP on "Fisheries Management in Lentic Water System : Stocking of Reservoir with Fish Seed"

The final workshop under NATP of PSR 48 entitled "Fisheries Management in Lentic Water System : Stocking of Reservoir with Fish Seed" was organised at Institute's Headquarters, Barrackpore during November 21 and 22, 2003. The workshop was inaugurated by Dr. M. Sinha, ex-Director, CIFRI and was presided over by Dr. P. Das, ex-Director, NBFGR. The cooperating centre, PI's presented papers on their work and achievements. All the scientists of the Headquarters actively interacted with the CCPIs.

Scientists interacting in the NATP workshop

Workshop-cum-training programme on Participatory Approach to Research and Development of Inland Fisheries Resources of Northeast

The Central Inland Fisheries Research Institute (CIFRI), organized a 12-day long Workshop-cum-training programme on Participatory Approach to Research and Development of

Inland Fisheries Resources of Northeastern India at its Northeast Regional Centre, Guwahati during December 1-12, 2003. The programme was aimed at developing tools, techniques and methods of participatory approach in the research and development of inland fishery resources. It is part of the efforts made by the Institute to meet the training needs of the Northeast in the field of inland fisheries. A total of 27 fisheries officers from 7 states of the Northeastern region (except Mizoram), participated in the training programme. This is for the first time that a workshop on participatory approach to research and development of inland fisheries resources was held in the region.

Mr. S.M. Sangma, Honourable Minister for Fisheries, Govt. of Meghalaya at the inaugural session of workshop-cum- training programme

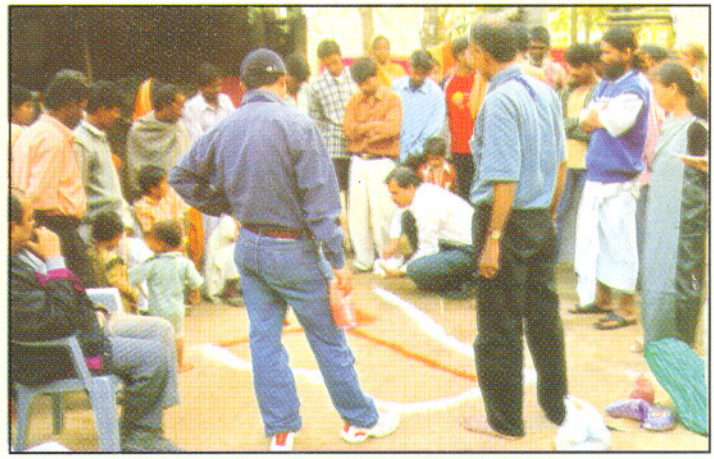
Mr. S.M. Sangma, Honourable Minister for Fisheries, Govt. of Meghalaya formally inaugurated the training programme on 2nd December, 2003. Dr. M. Choudhury, Officer-in-Charge of the centre welcomed the trainees and accorded words of appreciation to the trainee officers from Sikkim, who were participating in the training programme for the first time.

Mr. S.M. Sangma in his inaugural address emphasized that regular trainings by CIFRI are needed to upgrade the knowledge of the farmers in the north-eastern region on the modern technologies developed for increasing fish production.

The Minister released 3 leaflets prepared by the Centre viz., 'Pen culture in beels of Assam', NER Centre of CIFRI and 'Floodplain wetlands management' on the occasion.

Delivering the presidential lecture, Dr. D. Nath, Director, CIFRI, Barrackpore emphasized the need for human resources development in the northeastern region for better management of its fishery resources and highlighted the efforts being made by the institute in this regard.

The training schedule was drawn in such a way that most of the recent information on participatory approach to research and development in inland fisheries were made available to the trainee fisheries officers. The last part comprised carrying out the PRA field exercises in villages bordering No.46 Morakolong beel (floodplain wetland), Morigaon District and in a fishing village (Amingaon) on river Brahmaputra. The results obtained from these exercises were synthesized in the form of a PRA report by the trainees with active collaboration by the facilitators. Various groups presented their findings.



Participants actively learning the PRA techniques

MANPOWER DEVELOPMENT

Dr. P.K. Katiha, Senior Scientist was deputed to Colombo, Sri Lanka from 13-15 August, 2003 to attend training workshop on Development of Research Proposals.

Dr. P.K. Katiha, Senior Scientist was deputed to Nairobi, Kenya from 2-6 November, 2003 for attending the baseline conference of the challenge programme on Water and Food.

Dr. P.K. Katiha, Dr. M.A. Hassan, Senior Scientists and Sri N.K. Barik, Scientist, were deputed to Dhaka, Bangladesh for attending the workshop on "Identifying thematic priorities in Indo-Gangetic basin under the challenge programme on Water and Food (CPWF)" from December 21-22, 2003.

Sri H.C. Karmakar, Principal Scientist, Sri D. Karunakaran, Sri N.K. Barik and Sri S.K. Sahu, Scientists participated in the National Workshop on Methodologies for Prioritization of Fisheries Research in India, from 10-11 November, 2003 at NAARM, Hyderabad.

EXTENSION SCENE

Training on Reservoir Fisheries Management in India with special reference to Karnataka

A training programme on "Reservoir Fisheries Management in India with special reference to Karnataka" was organized by the Reservoir Division of CIFRI, Bangalore on 28th and 29th October, 2003 at the Institute of Wood Science and Technology, Bangalore for the officials of Department of Fisheries, Karnataka. Key note address on Reservoir Fisheries Management was delivered by Dr. K.V. Devaraj, former Vice-Chancellor, University of Agricultural Sciences, Bangalore. He also released a training manual on Reservoir Fisheries Management. Mr. V.K. Murugesan, Officer-in-Charge, Coimbatore Centre of CIFRI presided over the function. Dr. D.N. Singh, Head, Reservoir Division of CIFRI welcomed the gathering and Dr. D.S. Krishna Rao proposed the vote of thanks.

Subsequently, Dr. P.S.B.R. James, former Director, CMFRI and former ADG (Fisheries) ICAR gave a detailed account on the problems and prospects of Reservoir Fisheries in India followed by audiovisual presentation by Dr. D.N. Singh, Mr. V.K. Murugesan and Dr. P.K. Sukumaran.

Lectures were delivered by Scientists of Reservoir Division, CIFRI on different aspects of Reservoir Fisheries Management. There was a separate session chaired by Dr. N.R. Ramakrishna, Jt. Director, Department of Fisheries, Govt. of Karnataka in which the problems faced by the officials in identifying and formulating programmes for the benefit of fishermen were discussed. It was decided to make attempts for pen and cage culture in selected reservoirs of Karnataka with research inputs from CIFRI. The Joint Director and trainees expressed their gratitude for imparting such an informative and useful training by CIFRI which would be helpful in enhancement of reservoir fish production from reservoirs.

Mass Awareness Campaign

A Mass Awareness Campaign was organised at Frazergunj on 8th August, 2003. One of the major landing centres of *Tenualosa ilisha* to make an appeal to the fishermen community to use nets having mesh size not less than 4" to avoid catching hilsa of smaller size. The Doordarshan Kendra, Kolkata telecast the same in their programme

Dr. D. Nath, Director, CIFRI explaining a point to the fishermen on fish conservation

Fish Farmers' Day at Samaguri, Assam

A Fish Farmers' Day was organized by the Northeastern Regional Centre of Central Inland Fisheries Research Institute (CIFRI), Guwahati at Samaguri Beel, Nagaon District, Assam on 30 December, 2003. The programme was sponsored by the NATP (Jai Vigyan) sub-project on *Enhancing freshwater fish production from the beels through pen culture in tribal and hilly areas of Assam.* The primary purpose of the programme was to facilitate informal interaction between the researchers of the Institute and the end-users about the *pros-and cons* of the pen culture technology demonstrated by the Institute in selected beels of the state. Over 100 beel lessees/fishers' cooperative society members/fishers from different beels of the district participated in the day-long programme.

Two leaflets on pen culture written in local languages (Assamese and Bengalee) were released and distributed among the participants.

Fish Farmers' Day at Samaguri Beel, Assam

VISITORS

Director General, ICLARM, Dr. (Mrs.) Williams visits East Kolkata Sewage-fed Fisheries

To get acquainted with the famous East Kolkata Sewage-fed fisheries Dr. (Mrs.) M. Williams, Director General, ICLARM and Chief of World Fish Centre along with other dignitaries e.g., Dr. (Mrs.) Laticia Ramoz (Sahani), Prof. Y. Mh. Khaul and Dr. Derek Staples visited two sewage-fed fish farms in East Kolkata. Dr. Amitabha Ghosh, Principal Scientist, CIFRI apprised the visitors on different aspects of the Sewage-fed pisciculture system in the vast wet-lands utilizing Kolkata city sewage. The visitors also discussed with the farmers on different aspects of the system. Shri S.K. Chakraborty, Joint Director of Fisheries, Dr. S.N. Biswas, Dy. Director of Fisheries West Bengal and Shri S.D. Ghosh, Secretary, North 24 Parganas Fish Producers Association also accompanied the team. A bulletin on Estuarine Wetland Fisheries, published by the Institute, was given to Dr. (Mrs.) M. Williams for having an overall view on the sewage-fed and other wetland aquaculture systems. Dr. Merryl Williams and other visitors showed their keen interest and felt that such system of fish culture was a unique experience to them.

STAFF NEWS

Appointment

	Position	*Effective from*
Sri Sanjay Kumar Das	T-1	11.09.2003

Promotion

	Position	*Effective from*
Dr. A.K. Das	Sr. Scientist	21.07.2003
Dr. M.A. Hassan	Scientist (SS)	27.07.1998
Sri Babul Kanti Das	Assistant	18.12.2003
Sri Ambika Lal	-do-	-do-
Mrs. Divya Jain	Senior Clerk	19.12.2003
Sri Biswajit Barua	-do-	-do-
Sri K. Kalianan	SSG-IV	18.12.2003

Upgradation to the next higher scale under the ACP Scheme

	Upgraded scale	*Effective from*
Mrs. Hemlata Halder, SSGII	Rs.2650-4000	07.07.2003
Sk. Munsur Ali, SSG.II	-do-	25.10.2003

Transfer

	From	To
Dr. A. Mukherjee, Pr. Scientist	Malda	Kolkata
Dr. P.K. Saha, Pr. Scientist	Guwahati	Barrackpore
Dr. D.K. Kaushal, Pr. Scientist	CIFRI, Karnal	ICAR Research Complex, Patn
Dr. B.L. Pandey, Scientist (SS)	Vadodara	Allahabad
Dr. A.K. Das, Senior Scientist	Bangalore	Barrackpore
Sri R.C. Mandi, T-6	Vadodara	Barrackpore
Sri K. Manjhi, Sr. Clerk	Karnal	Barrackpore
Sri J.G. Chatterjee, Pr. Scientist	Kakdwip	Barrackpore

Retirement

	Date of retirement
Sri Bideshi Lal, SSG-III	01.01.2003 (FN)
Sri Jangli, SSG.IV	31.07.2003
Sri Ramji Tiwari, Technical Officer (T-5)	30.09.2003
Sri H.L. Sarkar, Assistant	30.09.2003
Sri C.C. Das, Assistant Adm.Officer	31.12.2003
Sri P.S.C. Bose, T-5	31.12.2003

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