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ANNUAL REPORT
2004 - 2005

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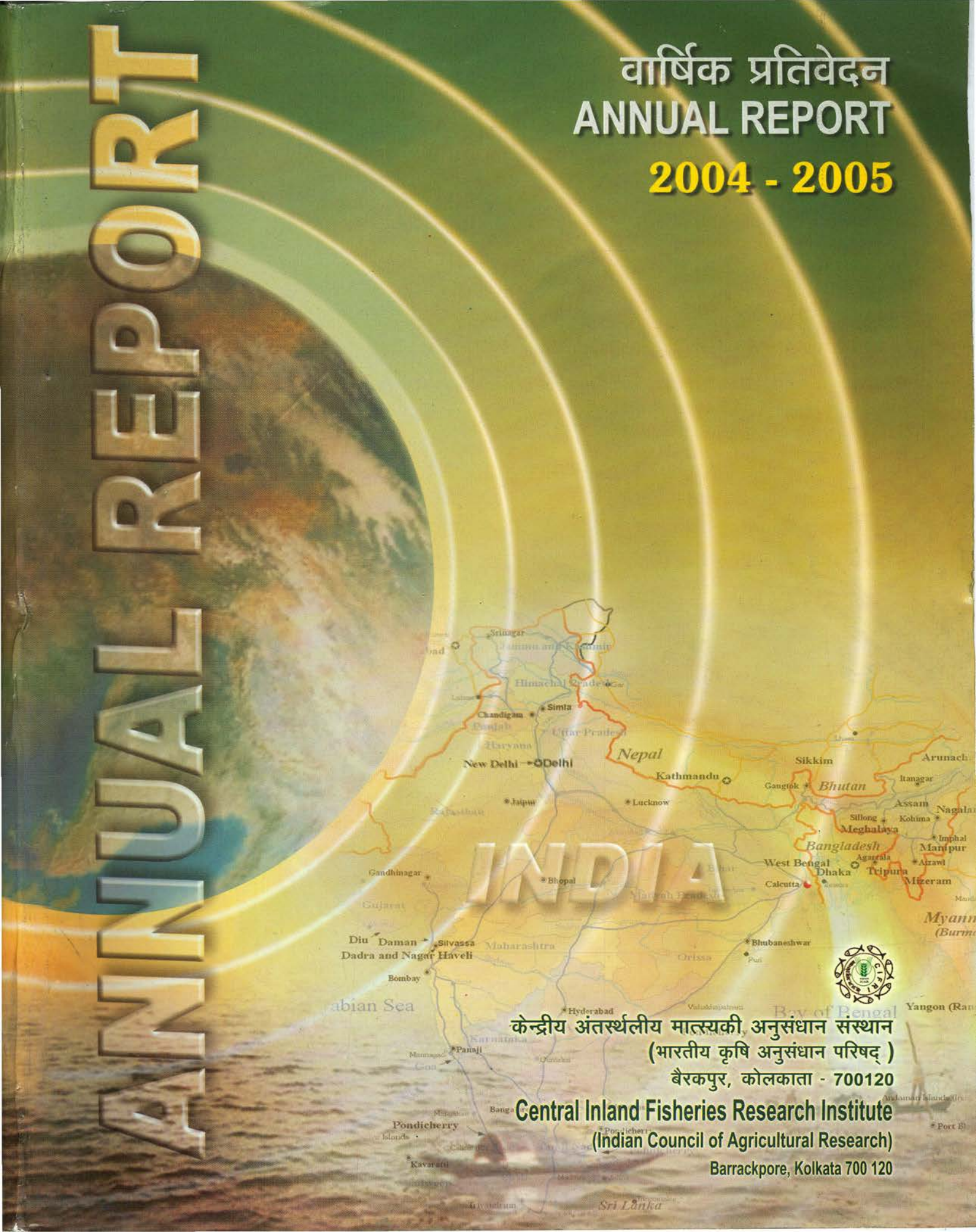

केन्द्रीय अंतर्स्थलीय मात्स्यकी अनुसंधान संस्थान
(भारतीय कृषि अनुसंधान परिषद्)
बैरकपुर, कोलकाता - 700120

Central Inland Fisheries Research Institute
(Indian Council of Agricultural Research)
Barrackpore, Kolkata 700 120

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ANNUAL REPORT

CIFRI

2004 - 2005

भाकृअनुप
ICAR

Central Inland Fisheries Research Institute
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Barrackpore, Kolkata 700 120

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ANNUAL REPORT
2004 - 2005

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- *The activities and achievements reflected in this Annual Report covers the period April 2004 to March 2005 only.*
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CIFRI

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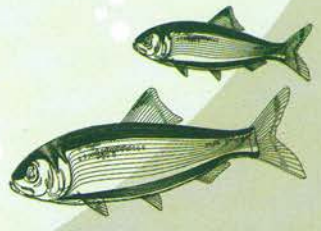

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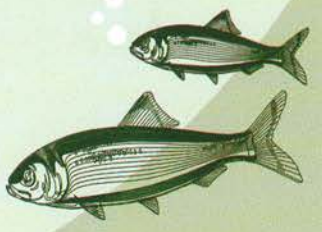
PREFACE

CIFRI



PREFACE

The Central Inland Fisheries Research Institute during the year continued its research to promote the understanding of production functions in our inland aquatic resources viz., rivers, reservoirs, estuaries, wetlands apart from addressing the issues related with resource assessment on GIS format including monitoring and management of fish and ecosystem health. In order to generate required database and develop policy support the institute worked on thirteen research projects covering different theme areas. The institute also took initiative to create awareness about biodiversity and ecosystem conservation among the fishers who depend upon the fishing activities along rivers and estuarine systems. Attempts were also made to demonstrate various fishery enhancement techniques to different user groups operating in wetlands.

Our co-operation with fishery department in the State of West Bengal, Gujrat, Karnataka, Assam, Haryana, Uttar Pradesh grew from strength to strength. The CIFRI through a Govt. of India sponsored project has been deeply involved in GIS application in fishery resource assessment with thirty-five States and Union territories. This is one of the massive efforts in fishery resource assessment in inland fishery sector in the country. The institute has also been involved with network projects with sister institutes, SAU's and other research organizations. At the international level two programmes with the support from World Fish Centre Penang, Malaysia were executed satisfactorily. In view of Tsunami tragedy, significant information was provided to authorities on mangroves by CIFRI, for inclusion in mangrove based restoration action plan for affected coastal areas. The institute remained committed to generate internal resources and to achieve the target set by council and we met the target by overall performance of scientists and technicians. With regard to NEH activities, the institute executed the approved work programme satisfactorily with main focus on fisheries enhancement from floodplain wetlands. As a part of our special effort on awareness, different publications were released during the year and sixteen exhibitions and farmer's day were organized.

All mandatory meetings of Research Advisory Committee, Staff Research Council, Management Committee, Institute joint staff council, were held as per schedule and action were taken as per their suggestions for research and institute management.

The scientists, technicians and administrative staff were provided adequate opportunities for professional improvement and manpower development programmes by their participation in different seminars, workshops and training programmes.

I express my sincere thanks to Dr.Mangala Rai, the Secretary DARE & D.G., ICAR for his support and encouragement to the activites of CIFRI. I am grateful to Dr. S. Ayyappan, DDG (Fy) ICAR for his guidance and continued support in furthering the research activities of this institute. Time to time support provided to this institute by the fishery division of council especially Dr.V.R. Chitranshi (ADG, I Fy); Dr. A.D. Dewan (ADG, M Fy), Shri Anil Agarwal (Pr. Scientist) and Shri A.S. Bhatia, Under Secretary is thankfully acknowledged.

All the achievements highlighted in this report are the out come of the sincere efforts made by all members of staff of CIFRI during the year for which they deserve appreciation but there is significant scope to improve our performance. I hope that in future too they will undertake the activities of this institute with renewed dedication and commitment.

This brief report of CIFRI, I am hopeful, will be useful to various persons and organizations interested in inland open-water fishery and ecosystem management for achieving sustainable fishery and biodiversity conservation. I personally seek their indulgence and response to make it more presentable and informative in years to come.

I am thankful to Dr. Manas Kumar Das, Principal Scientist in compiling the basic draft of the document and to all other colleagues who have extended their help. Shri Rao has rendered his assistance in Hindi summary, is duly acknowledged.

Barrackpore, Kolkata
29th June, 2005

K.K.Vass
Director

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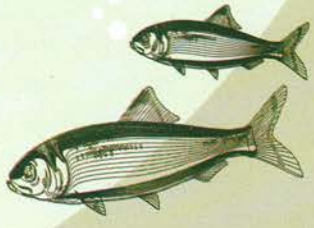
EXECUTIVE SUMMARY

CIFRI



EXECUTIVE SUMMARY

The Central Inland Fisheries Research Institute (CIFRI) was established in March, 1947 initially as a research center and later upscaled to the level of full-fledged institute. Over the years, the organization has grown and established itself as a premier institute in the field of inland fisheries in the country. The institute is located at Barrackpore, Kolkata in the State of West Bengal. The institute at present has sixty-five scientists, eighty-seven technicians, seventy-five administrative staff and hundred seventyfour supporting personnel. The institute had a total budget of Rs.12.54crores for the year 2004-2005.

The Institute organized its research programmes as per the guidelines of the high level Research Advisory Committee (RAC) comprising mostly of eminent professionals from the field of fishery and aquatic ecology. The programmes were so designed that philosophy of VISION 2020 and recommendations of last QRT were kept in view, apart from directives received from SMD and Council from time to time. The institute also has a Management Committee guiding the activities. A number of internal committees such as Staff Research Council, Institute joint staff council, Official language committee, Consultancy processing cell etc are in place and contributed in Institute's management activities through periodic meetings and decisions taken.

Continuing our efforts, the Institute during the year focussed its attention on overall performance, which involved research, transfer of technology, internal and external human resource development, public awareness programmes, establishment of linkages and institution building activities.

The research programmes are designed with major thrust on ecosystem research involving resource base assessment, ecology, biodiversity, fish stock evaluation including yields and environment monitoring and its management.

During the year the Institute worked on thirteen research programmes apart from five externally funded projects and two internationally funded ones. Salient achievement under various programme areas are highlighted as under:

Dominance of C. carpio in fish catch of river Beas.

Ramsagar reservoir, Rajasthan.

Cage culture of fish in beel.

Riverine Fisheries

Recording of exotic carps *C. carpio* and *C. gariepinus* in river Beas is significant in view of alien species impact on indigenous fish stock.

Reservoir Fisheries

Seed rearing of *Catla catla* and *Labeo rohita* was successfully done in cages in Kabini reservoir, and fingerlings after attaining 5 to 6g in weight were released in the reservoir for fishery enhancement.

Rapid survey of small reservoirs of Rajasthan and Uttar Pradesh was carried out.

Estuarine Fisheries

Catch of freshwater fish species from Hooghly estuary increased to 11.5%, which is an impact of drop in salinity levels. A 118.0% increase in juvenile destruction of Hilsa in Hooghly estuarine system was recorded, which is a disturbing development for fish stock sustainability.

Floodplain Fisheries

Cage culture of *L rohita*, *C. mrigala* and *L. calbasu* in beels at stocking density of 50 -100 nos m^{-2} recorded a final weight of 39.49, 21.6g, and 11.0g respectively in 120 days, revealed negative impact of high stocking density on growth in cages also.

Fish health & Environment

DNA probes were developed for specific detection of Aerolysin gene positive *A. hydrophila* and virulent (hemolysin gene positive) *Aeromonas* spp.from diseased fish sample of fish using DNA dot blot hybridization technique

Environmental status of river Churni was assessed, by applying a suite of developed and standardized bioindicators at biochemical, physiological and community levels.

Resource assessment

Digital base maps for all districts of Rajasthan were prepared.

Mapping and inventory of all water bodies above 10 ha including rivers and streams, of Bihar were completed. A detailed database has been developed on GIS platform.

Fish catch data from various fish landing centres of India has been stored in GIS platform for easy retrieval.

Other activities

The meeting of the various committees of the Institute viz., SRC, RAC, Management, Official language committee, IJSC were held as per schedule. The respective committees discussed various agenda items and provided guidelines for the proper management and smooth functioning of the Institute and the research activities.

The CIFRI family is representative of the diverse cultures of the country and each member participated in celebration of various national days, events with genuine spirit of harmony and brotherhood.

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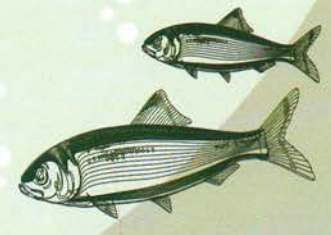
INTRODUCTION

CIFRI



INTRODUCTION

Brief History

Based on the recommendations of sub-committee of the Central Government on Agriculture, Forestry and Fisheries the Central Inland Fisheries Research Station was formally established on 17 March 1947 in Calcutta under the Ministry of Food and Agriculture, Government of India. From this modest beginning, the station expanded its activities and was elevated in 1959 to the status of an Institute (CIFRI) and moved to its own building at Barrackpore (West Bengal). Over the years, the organization has grown and established itself as a premier research institution in the field of the inland fisheries and aquatic ecology in the country. Since 1967, the Institute is under the administrative control of Indian Council of Agricultural Research (ICAR), DARE, and Govt. of India.

Initially the main objective of this Institute was to conduct investigations for a proper appraisal of all inland fishery resources of the country and to evolve suitable methods for their optimum fish production. While fulfilling the above objective, the Institute directed its research efforts towards understanding the ecology and production functions of different types of inland water bodies in the country. But investigations were also conducted to understand pond ecosystem, its bearing on fish production which eventually lead to development of farming practices to obtain high fish yield from unit of water area.

The Institute during late sixties and seventies focussed its attention on aquaculture research and development in consonance with the plan priorities of Government of India. Having achieved significant progress in fishery research and farming practices in the country, the planners between 1971-1973 approved four All-India Coordinated Research Projects, one each on "Composite Fish Culture", "Riverine Fish Seed Prospecting", "Air-breathing Fish Culture" and "Ecology and Fisheries Management of Reservoirs" and "Brackish water Fish Farming". The success of combined project of "Composite Fish Culture & Fish Seed Production" initiated in 1974 was the turning point in the history of fish culture in India and provided a solid foundation for the development of freshwater aquaculture in the country. This resulted in the establishment of the Freshwater Aquaculture Research & Training Centre at Dhauli (Orissa) in 1977, which later became, Central Institute of Freshwater Aquaculture (CIFA) in 1987.

Simultaneously, Central Institute of Brackish-water Aquaculture (CIBA) and National Research Centre on Coldwater Fisheries (NRCCWF) were carved out from this Institute to carry out research on brackish-water aquaculture and coldwater fisheries respectively. Thus, CIFRI gave birth to three major fisheries research Institutions in the country.

As a consequence of creating specialised sectoral institutes and keeping in view the emerging issues in open-water fishery science within and outside the country, with greater emphasis on open water fisheries and aquatic resource management, the CIFRI mandate, was modified.

Mandate

In the light of changing scenario and to cater to the existing R&D needs of the sector, the Institute's research focus has shifted to:

Sustainable Productivity and Ecosystem health and benefits

With this shift in focus, the revised mandate for CIFRI which is proposed in revised VISION-2020 of the institute, is as follows:

- Generate scientific database on fish and fisheries of Inland open-waters viz. rivers, estuaries including lagoons, reservoirs and wetlands
- Developing ecosystem based management strategies for sustainable fishery enhancement in reservoirs and wetlands
- Monitoring ecosystem changes and their impacts on fisheries and developing mitigation plans.
- Providing policy support for responsible fisheries and conservation of inland aquatic ecosystems

Organisational structure

Till the revised divisional plan reflected in revised VISION-2020 is approved by council, at present the institute is pursuing its research activities through seven main divisions, which are in turn supported by different research support services / sections.

The **Riverine Division**, with its headquarters at Allahabad, in U.P. strives to monitor and develop effective management action plan for riverine fisheries and resources of the country with adequate emphasis on the conservation of fish stocks and riverine environment. The **Reservoir Division** is based at Bangalore, in Karnataka. The investigations carried out in the Division are aimed at developing management norms for optimising fish yield from large, medium and small reservoirs of the country.

The other divisions are Barrackpore (Kolkata)-based. **Estuarine Division** is involved in working on estuarine fishery and ecology, coastal wetlands and Sunderban mangrove ecology. The **Fish Health and Environmental Monitoring Division**, is working on fish health and environmental issues related to open-water fishery resources viz., rivers, wetlands, reservoirs and estuaries. It is also looking at biochemical, microbiological and biotechnological approaches for environment monitoring and management. Development of mitigation action plan for ecosystem restoration is also the responsibility of this division. The **Floodplain Wetlands Division** carries out research on the wetland ecosystem production processes and fish production enhancement providing special attention to biodiversity conservation and development of environment-friendly technologies. The **Resource Assessment Division** conducts research aiming at creating a database on the fish stocks and fishery resources. The Division is geared up to develop various population models that can lead to sustainable exploitation of inland fish stocks and develop resource management database on GIS format. The **Human Resource Development and Transfer of Technology Division** aims at manpower training and imparting education to fisheries personnel under Human Resource Development for producing qualified persons. The Transfer of Technology wing undertakes on regular basis the dissemination of various technologies of inland fisheries to the fish farmers, fishermen, entrepreneurs, extension functionaries through training, demonstration, advisory service, fish farmenrs' day, camp discussion, film show, exhibition, etc.

The Director in Research Management position heads the institute. The responsibility of overall management of the institute lies with Management Committee under the chairmanship of the Director. The Staff Research Council and the Research Advisory Committee make the specific recommendations pertaining to research and extension activities of the institute. The Institute's research activities are organised under various research projects, which are executed from the headquarters at Barrackpore (Kolkata), and Regional Centres at Allahabad, Bangalore, Vadodara and Guwahati. The structural outline of the institute is depicted in the Organo-gram.

CIFRI AND ITS REGIONAL RESEARCH CENTRES

ORGANOGRAM OF CIFRI

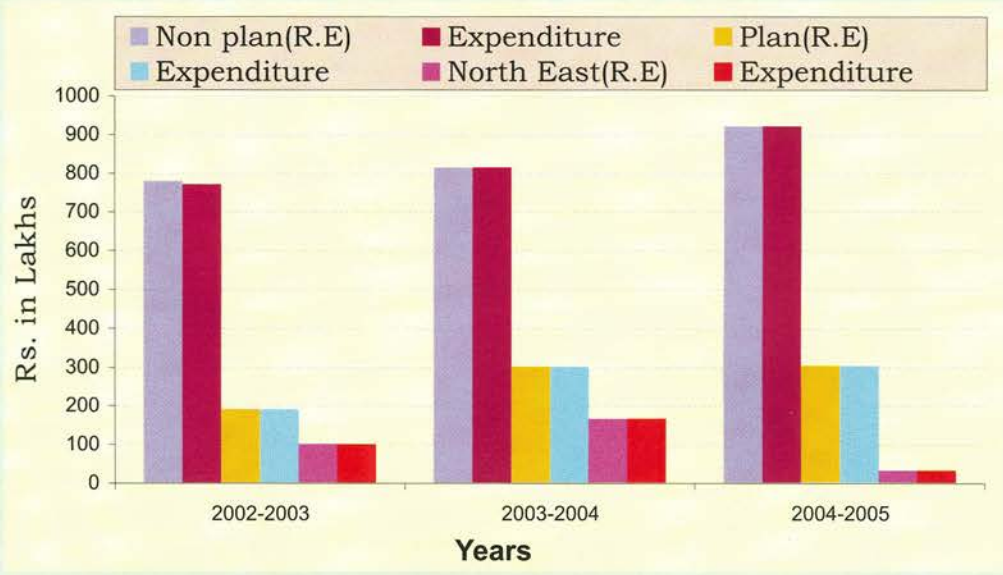
Documentation Section

It is entrusted with the responsibity of publication of bulletin, annual report, newsletter, brochure etc. During the year this section published CIFRI annual report, two newsletters and ten bulletins.

ARIS facility

The computer related facilities are provided to the scientists and other staff members of the institute by this cell. Total LAN system is in place and Internet facility has been provided to scientists at main building.

Financial Statement

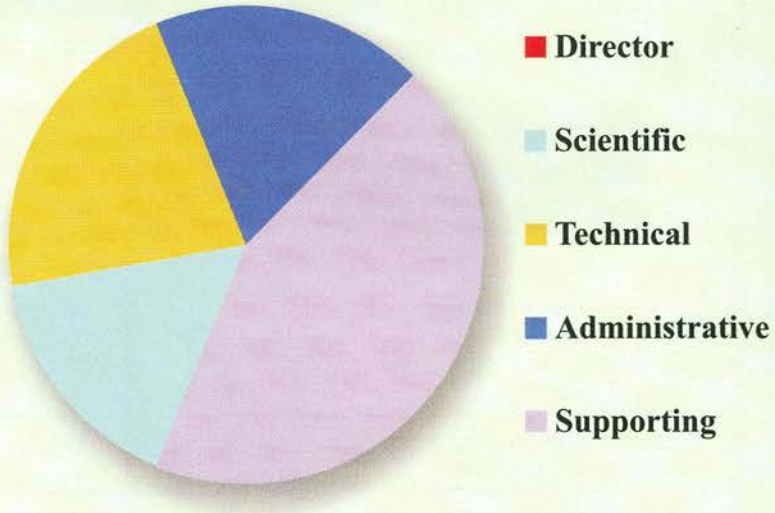


Budget Statement for the year 2004 –2005 **(Rs in lakhs)**

Head of Account	Budget (R.E.)		Expenditure	
	Plan	Non plan	Plan	Non plan
Pay & allowances including OTA	-	761.85	-	761.86
T.A	10.00	10.70	10.00	10.69
Other charges including I.T and H.R.D	258.75	115.00	258.84	116.42
Works	25.25	29.95	25.25	29.05
Others	8.00	3.00	7.91	2.48
Grand total	302.00	920.50	302.00	920.50
N.E component	32.00	-	32.00	-

Staff position as on March 31, 2005			
Serial no.	**Category**	**Sanctioned**	**In position**
1.	Director (RMP)	01	01
2.	Scientific	98	65
3.	Technical	98	87
4.	Administrative	84	75
5.	Supporting	183	174
	Total	**464**	**402**

Staff position as on March 31, 2005



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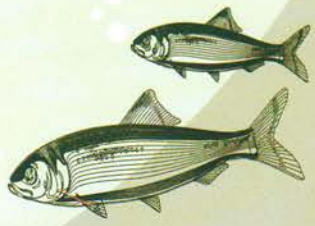
Research Achievements

CIFRI



RESEARCH ACHIEVEMENTS

Research achievements during the year under major programmes areas at CIFRI are given hereunder:

INSTITUTIONAL PROJECTS

RIVERINE ECOLOGY AND FISHERY

ASSESSMENT OF ECOLOGY, BIODIVERSITY AND PRODUCTION POTENTIAL OF INDUS RIVER SYSTEM

D.N. Mishra, Usha Moza, Sushil Kumar, Kuldeep Singh, C. Lakra,

Ecology and Fishery of the River Beas

Chemical features

Sediment characteristics: Sediment exhibited pollution impact only at the point of discharge where soil is near neutral (pH 6.9); % of silt 37.5, specific conductivity 276.7 mhos cm^{-1} and all other available nutrients record increased levels. This impact is witnessed only up to 1-2 km stretch (BOF Mukerian).

Water characteristics: At point pollution discharge river becomes slightly acidic (pH 6.7), having low D.O. 5.8 mg l^{-1}; high B.O.D. 13.87 mg l^{-1}, C.O.D. 75.22 mg l^{-1} and conductivity 244 mhos cm^{-1}. The available salts and nutrients are also high. Gross primary production ranged between 108.75 to 148.43 mg C m^{-3} hr^{-1} highest value recorded at Beas bridge.

Biological features

Plankton: The overall standing crop of plankton was low in upper segment (Talwara-AOF Mukerian) (76-67 u l^{-1}) compared to lower segment (84-243 u l^{-1}). It was minimum 50 u l^{-1}, at discharge point (OF Mukerian),and reflects the impact of effluents.

Periphyton: Periphyton concentration was high, 709 u cm^{-2} at Talwara, than rest of river (209-326 u cm^{-2}). It was minimum at (OF Mukerian) 159 u cm^{-2}. The periphyton composition like plankton exhibited impact of effluents. Upper segment with no effluent input had 64.72% diatoms. The pollution discharge sites recorded 53% blue green algae while lower stretch registered 48-62% diatoms, 10-12% green algae and 28-40% blue green algae.

Macrobenthos: The benthic density was high in upper stretch, 344-564 u m^{-2}, maximum at (OF Mukerian) 590 u m^{-2} and low 93-233 u m^{-2} in lower stretch, being minimum at Beas bridge (93 u m^{-2}).

Macrophytes: Submerged weeds were present only at Talwara and Harike. The average biomass (wet wt.) 0.005 kg m^{-2} at former and 0.5 to 8.5 kg m^{-2} at latter.

Macrophyte associated fauna: Meiofauna was present all along the river even at those sites where submerged weeds were absent. Population was associated with emergent grass along the banks. The meiofauna density was high 94 u m^{-2} at Talwara followed by Beas bridge 42 u m^{-2}, while in rest of the stretch, density varied between 21-24 u m^{-2}.

Fisheries

Fish biomass: The estimated average fish biomass for the current year April (04) to March (05) was 38.12 t $month^{-1}$. The biomass was high 49.10t $month^{-1}$ for pre-monsoon (April-June, 04); 39.70t $month^{-1}$ for monsoon (September, 04) only, 33.48 t $month^{-1}$ for post-monsoon and 30.35 t $month^{-1}$ for winter (January-March, 05). The biomass was higher compared to last year (23.63 t $month^{-1}$) exhibiting an enhancement of 14.49 t $month^{-1}$ amounting to 38% increase.

Fish catch composition: The fish species composition revealed dominance of major carps forming 36.76% of total population,with highest (30.43-53.53%) during monsoon as these get caught during spawning run. The other fishes present were minor carps 20.57%; common carp 19.70% and miscellaneous 14.57%.

S. richardsonii in fish catch of river Beas.

C. gariepinus in fish catch of river Beas/ Sutlej.

The miscellaneous are formed of murrels, *B. bagarius, R. rita, N. notopterus*. Large size catfishes formed only 7.32% of total population out of which 4.54% was contributed by *W. attu*, 2.62% by *A. seenghala* and only 0.16% by *A. aor*. The Mahseer, *Tor putitora* population, about 0.79% of the total was confined to the specific ecological zones (Talwara-Pathankot, Mukerian). While *Schizothorax richardsonii* forming only 0.24% of total population was restricted to Pathankot segment.

The species composition did not reveal much change from last year except in presence of *C. gariepinus* to the tune of 0.02 t at Harike during May and June forming 0-.05% of total population of the year and in continuing decline of *C. catla* from 2.03% (2002-03) to 0.53% (2004-05). Irrespective of catla decline, IMC as group, recorded reasonable contribution to the total catch.

Pollution load of Nallas

Chakwal: Water quality indicated that Nalla has become anerobic in nature having only 0.53 mg l^{-1} of dissolved oxygen compared to 3.8 mg l^{-1} during 2002-03; with B.O.D. of 28.50 mg l^{-1} and C.O.D. of 82 mg l^{-1}.

Kalibein: Water quality has also recorded deterioration over a period. It has turned slightly acidic in pH (6.8) from alkaline pH (7.13) (2002-03). There is decrease in dissolved oxygen from 6.7 mg l^{-1} (2002-03) to 4.5 mg l^{-1} (04-05) but increase in nutrients and dissolved solids was evident. While B.O.D. (20 mg l^{-1}) and C.O.D (59.5 mg l^{-1}) values did not vary significantly in comparision to previous years.

Biotic components: It sustained plankton density of 191 u l^{-1}, macrobenthic population of 874 u m^{-2}, macrophyte biomass of 3-9 kg m^{-2} (wet biomass) and macrophyte associated population of 68 u m^{-2}.

Ecology of Kanjli Wetland

Soil and Water quality

The water is slightly acidic pH 6.19; with low D.O. 5.1 mg l^{-1} and free CO_2 1.0 mg l^{-1}, high B.O.D. 17.62 mg l^{-1}; C.O.D. 59.95 mg l^{-1} and specific conductance of 197.5 µmhos cm^{-1}. The soil is alkaline with pH ranging between 7.38-7.46 and available phosphorus and nitrogen estimated at 2.22-2.35 and12.04-12.70 mg 100 g^{-1} respectively.

Biological attributes

Plankton density ranged between174-183u l^{-1} being more towards lentic zone. Significant periphyton populations in the range of 509-517 u cm^{-2} were recorded along the embankments. Significant benthic diversity was recorded with odonate nymphs contributing 16-19% followed by hemiptera 4-9% in a total population density of 246-509 u m^{-2}. Macrophytes contributed to the biological components of this wetland with wet biomass of 5.0-5.8 kg m^{-2} at above barrage zone while it was in the range of 1-2 kg m^{-2} below barrage zone. The macrophytes served a habitat for meiofauna and their density was recorded in the range of 37-284 u m^{-2} between two sites.

Fishery status

Fish Biomass: Estimated fish biomass was 5.56 t month-1 for the year (04-05). It being 39% more than last year (3.39 t month-1) although fishing period for the year (2003-04) was for 10 months.

Fish composition: The catch composition during the year was dominated by major carps (30.57%) followed by miscellaneous (29.49%), common carp (25.19%), minor carps (11.33%) and catfishes (3.43%).

Experimental fishing: Experimental fishing conducted during monsoon season (June August) recorded absence of major carps, but presence of minor carps, miscellaneous species and catfishes in the catch, thereby indicating that these species are indigenous to the fauna of wetland.

EVALUATION OF HABITAT DEGRADATION IN THE CONTEXT OF FISHERIES ECOLOGY IN RIVER GANGA

R.S. Panwar, H.P. Singh, D.N.Singh A.K. Laal, D. Kumar, R.N. Seth, Shree Prakash, R.K. Tyagi, V. Pathak, B.K. Singh, P.N. Jaitly, B.L.Pandey R.S. Srivastava, K.D.Joshi, B.P. Mohanty, D. Karunakaran B.D. Saroj, S.K. Srivastava, J.P. Mishra, Kalpana Srivastava, H.C. Banik

About 2000 km stretch of the river Ganga, from Deoprayag to Farakka, was investigated at 13 pre-determined sampling centers and using standard methodologies.

Water and Sediment Quality

Current velocity was maximum at Deoprayag (4.7 Km hr^{-1}) and minimum at Farakka (0.77 Km hr^{-1}) while silt load was maximum at Patna (568 g m^{-3}). Discharge of water showed considerable decline from 3845 m^3 sec^{-1} reported in 1996-97 to 2011 m^3 sec^{-1} during present study in 2004. Similar trend was recorded for tributaries also.

Sediment between Deoprayag and Farakka was constituted by sand (67.5-98.75%) while the silt and clay percentage were very low in upper stretches but increased sharply in down stream stretches. The chemical features were alkaline pH (7.41 to 8.07), medium to poor available nutrients (N-5.8 to 20.4 & P-0.39 to 3.4 mg $100g^{-1}$) and poor organic carbon (0.014 to 0.05%).

The common features of water quality of Ganga between Deoprayag and Farakka was rich oxygen (6.53 to 9.8 mg l^{-1}), alkaline pH (8.0 to 8.26) and poor nutrients (NO_3-0.05 to 0.13 mg l^{-1} and PO_4 0.018 to 0.085 mg l^{-1})

Considerable inter stretch variations were observed in alkalinity, conductance, dissolved solids, calcium, magnesium and hardness all being minimum in Deoprayag (55.0 mg l^{-1}, 149 µmhos, 74.3 mg l^{-1}, 14.9 mg l^{-1}, 6.3 mg l^{-1} and 65.7 mg l^{-1}, respectively) and maximum at Varanasi (165.0 mg l^{-1}, 463.0 µmhos, 231 mg l^{-1}, 36.51 mg l^{-1}, 23.15 mg l^{-1} and 197.6 mg l^{-1}) except alkalinity which was high at Kanpur.

The rate of energy transformation by producers in the entire stretch was maximum at Kanpur (6462 cal m^{-2} day^{-1}) and minimum at Deoprayag (1662 cal m^{-2} day-^{1}). The potential energy resource of Ganga ranged between 39, 984 and 1,77, 072 K cal ha^{-1} yr^{-1}. Detritus energy was maximum at Kanpur (5.93 x10^4 cal m^{-2} day^{-1}) and minimum at Deoprayag (0.26 x10^4 cal m^{-2} day^{-1}). Maximum diurnal variation was observed at Varanasi and Allahabad where oxygen increased by 4.32 and 3.84 mg l^{-1} and bicarbonate decreased by 10 mg l^{-1}.

Accumulation of pesticide in sediment was maximum at Farakka (103.8 ng g^{-1}) and minimum at Deoprayag (12.0 ng g^{-1}) while in molluscan samples the value ranged

from 4.2 to 10.8 ppb. The main component of pesticides was HCH and DDT in both, while endosulfan and aldrin were detected in samples from Varanasi and Kanpur.

The accumulation of Cu, Pb and Zn in sediment was 0.8 to 17.2, 7.8 to 44.2 and 12.8 to 80.0 $\mu g\ g^{-1}$, respectively being minimum in Deoprayag and maximum at Allahabad. Similar pattern was recorded in the water samples. The metal levels were maximum in molluscan samples from Kanpur (0.78, 2.48 and 11.8 ppm) while concentrations of Cr and Cd were very low in all the cases.

Sampling site at Deoprayag

Biological features

Among plankton communities at Deoprayag, Rishikesh and Haridwar phytoplankton were dominant with numerical superiority of bacillariophyceae followed by chlorophyceae and myxophyceae respectively.

Zooplankton population generally appeared in potamon zone, with maximum density recorded at Kanpur due to enriched water brought in through tanneries and city sewage effluents.

Periphyton forms were dominated by bacillariophyceae with maximum in winter and minimum in monsoon, recording highest population at Kanpur and Rajmahal. Seasonal abundance coincided with initiation of recuperation phase of the river Ganga.

Benthic population reflected significant diversity viz. molluscs, annelids, ephemeroptera and dipterans with dominance of gastropods in entire stretch and diptera at Kanpur which is attributed to level of pollution.

Sampling benthos in River Ganga at Patna.

Seed potential

Quantitative indices of spawn was 425 ml and qualitative indices of spawn was 56% for major carps and 43% for minor carps. Among the carps comparative contribution was *L. rohita* 60%, *C. mrigala* 25%, *L. calbasu* 10% and

Sampling in River Ganga at Rishikesh

Catla catla 5%. During the year better availability of quality seed in comparison to last year may be attributed to marginally better approach for brood fish to breeding ground and good monsoon resulting in improved ecological conditions of the riverine stretch, due to improvement in environment initiated in river Ganga at Varanasi.

ESTUARINE ECOLOGY AND FISHERY

STUDIES ON THE ESTUARINE ECOSYSTEMS AND SALINE WETLANDS IN RELATION TO THEIR PRODUCTION POTENTIAL

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Hooghly estuary

Investigations on the hydrology and fisheries of Hooghly Estuarine system and its wetlands were undertaken during the period under report. The salient findings are as follows:

Water and Sediment Quality

Water quality: Water reaction of both the estuaries was slightly alkaline (Hooghly pH Av. 7.6, Rupnarayan pH Av. 7.73) and total alkalinity and free CO2 contents of both estuaries were very conducive for fish growth. Specific conductivity ranged between 1.27 - 1.46 millimhos cm^{-1}, which indicated that this estuary has only one salinity zone i.e. freshwater zone. There is no gradient or marine zone in this estuary. Moderate contents of organic carbon (0.27 - 1.1 %), available nitrogen (11.6 - 16.0 mg 100g-1), total nitrogen (0.023 - 0.098 %) and available phosphorus (1.68 - 1.93 mg 100g-1) and rich calcium carbonate (13.9 - 19.1 %) indicated that this estuary is congenial for aquatic life. Nitrate, total nitrogen, phosphate and sulphate contents of Rupnarayan were slightly lower than Hooghly estuary.

Gross primary production of Rupnarayan (105.4 mg C m^{-3} hr^{-1}.) was slightly lower than Hooghly estuary. Gross primary production of Rupnarayan (105.4 mg C m^{-3} hr^{-1}.) was slightly lower than that of Hooghly (107 mg C m^{-3} hr^{-1}.). The distillery effluent discharge at Roychak is locally polluting the Hooghly estuary. The NTPC thermal effluent discharged at Denan (near Kolaghat) are affecting the Rupnarayan.

Soil characteristics: The Hooghly estuary receives nutrient rich soil and silt from Ganga riverine system. This sediment releases nutrients to aquatic phase imparting high productivity to the system. The soil reaction was slightly alkaline (pH 8.5 - 8.8), which was conducive for aquatic productivity. Specific conductivity ranged between 1.3 and 3.4 millimhos cm^{-1} indicating lower salinity. Moderate content of organic carbon (0.37 - 0.89 %), available nitrogen (13.6 - 17.1 mg $100g^{-1}$), total nitrogen (0.03 - 0.08 %) and available phosphorus (1.6 - 6.7 mg $100g^{-1}$) and rich calcium carbonate content (11.0 - 21.6 %) indicated that nutrient release was very fast in the ecosystem presumably due to congenial physico-chemical factors such as temperature, water flow, tides and water reaction. However, the estuary is getting silted up due to heavy silt and sand load received from the river (coarse sand 1.3 - 36.9 %, fine sand 61.4 - 92.4 %). C: N ratio (10.8 - 19.6) is conducive for fish growth in general.

Impact of Rupnarayan discharge on nutritional status of the recipient Hooghly estuary was not very significant. However, the gross primary production of Rupnarayan was at par with Hooghly while plankton density in Rupnarayan was comparatively higher in comparison to the Hooghly estuarine system. Variation and group wise distribution of phytoplankton organism was conspicuous between the two systems.

Biological status

Plankton: The population density of plankton ranged between 120-350 u l^{-1} being the highest at Diamond-Harbour and the lowest at Falta in Hooghly estuary. The contribution of phytoplankton to the total plankton ranged from 54.83 to 78.36% being the highest at Nurpur and the lowest at Falta. A total of 73 species of phytoplankton were recorded. The contribution of zooplankton to the total plankton ranged between 34.38% and 48.32% being highest at Falta and lowest at Nurpur.Total plankton in river Rupnarayan, a tributary of Hooghly estuary, fluctuated between 250-630 u l^{-1} being highest at Gadiara and the lowest at Roychak confluence point.

Benthos: The total monthly abundance of macrobenthos in freshwater zone of Hooghly estuary varied from 205 to to 3162 u m^{-2} (av.1042 u m^{-2}). Gastropods (94.7%) were predominant followed by bivalves (5.0%) and miscellaneous species (0.3%). Marine zone of Hooghly estuary exhibited lower density of macrobenthos ranging from 355 to 690 u m^{-2} (av. 508 u m^{-2}) dominated by gastropods (81.4%) followed by bivalves (16.4%). In river Rupnarayan macrobenthos ranged from 149 to 2289 u m^{-2} (av. 1405 u m^{-2}). Gastropods (87.5%) were significant followed by bivalves (10.1%) and annelids (2.4%).

Fishery status

Total catch: Annual fish catch from the Hooghly estuary decreased by 3.7% (1828.3 t) and that of Digha centre by 50.8% (16959.6 t). The combined catch also decreased by 22.5 % (18787.8 t) compared to last year. Increasing trend in catch of freshwater species from freshwater zone continued to the tune of 11.5% over the previous year. Interestingly, catch of freshwater species of current year (512.2 t) recorded an increase of nine and half times (947%) compared to av. catch (48.9 t) of freshwater species between 1984-85 and 1989-90. However, 118.0% increase in juvenile killing was alarming for hilsa fisheries in Hooghly estuary system.

Winter Migratory Bagnet Fishery: The total estimated winter migratory bagnet fish catch during November, 2004 to January, 2005 was estimated at 29746.6 t forming 46.0% of total combined catch of Hooghly estuary and Digha centre with an average CPUE of 39.62 kg.

Fig. 1. Total Catch (in t) from the Hooghly Estuarine system

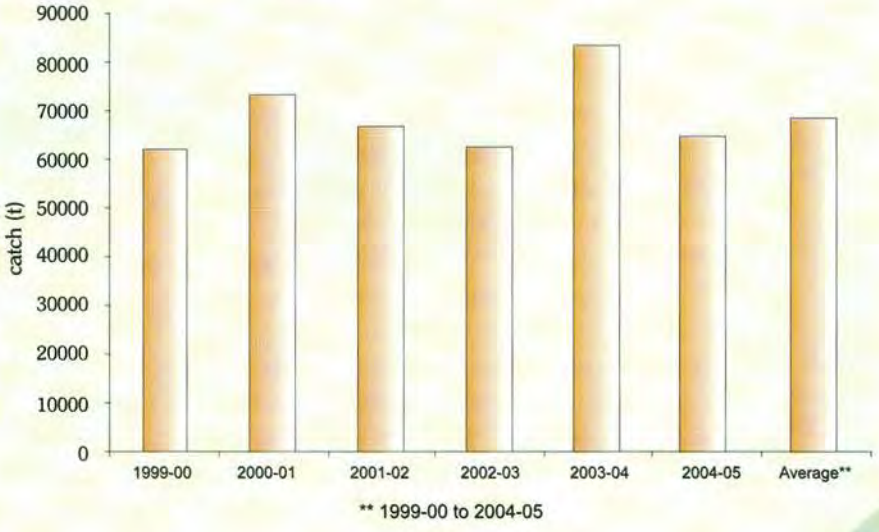


Fig. 2 Total catch (in t) and CPUE (Kg) of winter migratory bagnet fishery

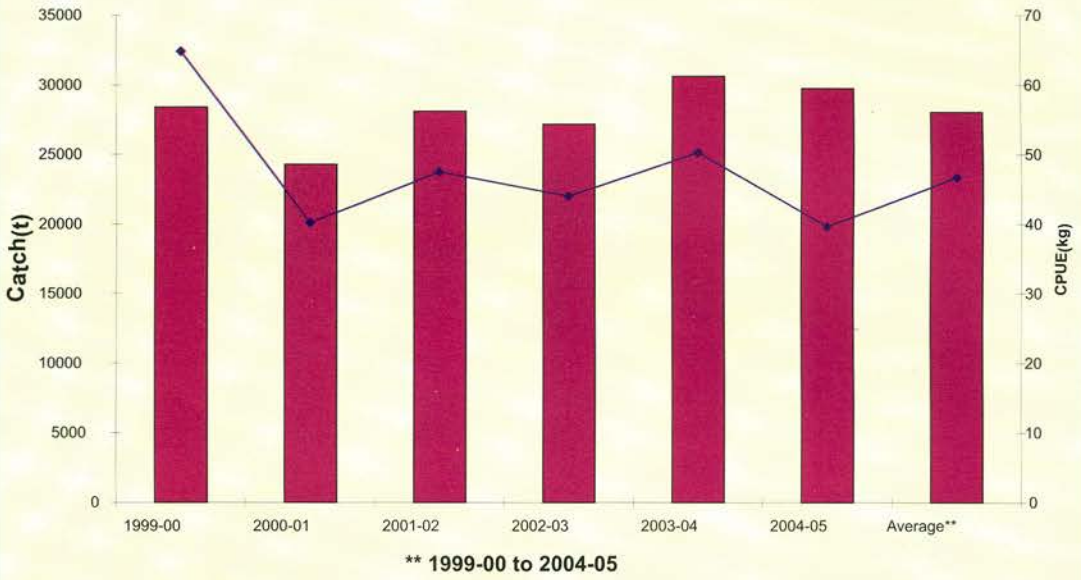
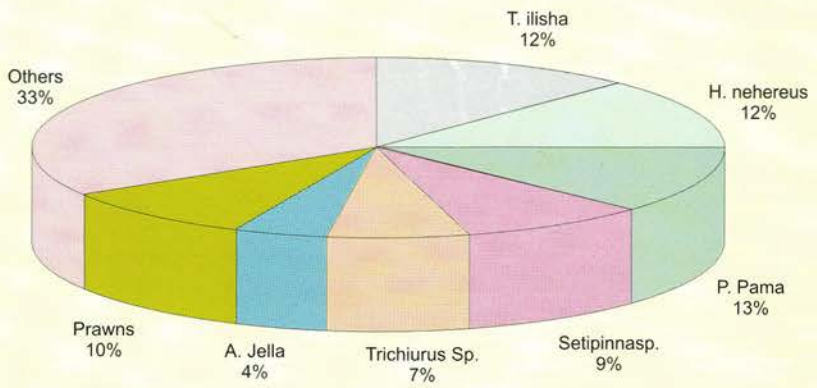


Fig. 3 Specieswise catch (t) Hooghly Estuarine system



Coastal Wetlands

Water quality

Biological and physico-chemical parameters of Kulti, Malancha and two wetlands at Radhakantapur were studied together with the connected rivers, e.g. Sakha Bidyadhari, Kulti-gung and Moni river. A general decline in salinity level is indicated in all the systems.

The gross primary production was highest in the low saline sewage fed wetlands at Kulti, 308.8 mgC m^{-3} hr^{-1}, followed by 286.44 mgC m^{-3} hr^{-1} in high saline wetland of Radhakantapur and 217.6 mgC m^{-3} hr^{-1} in the medium saline wetland at Malancha.

Biological status

The plankton density was highest in the low saline zone (mean value: 392.45 u l^{-1}) with zooplankton contributing about 64%. The high saline wetlands also registered zooplankton dominance (mean value: 244.31 u l^{-1}) while in Malancha wetland (mean value: 291 u l^{-1}) phytoplankton was predominant. Benthic macrofauna was highest at Kulti (23918 u m^{-2}) compared to Malancha (5330 u m^{-2}) and Radhaknatapur (3951 u m^{-2}).

Fishery status

The highest fish production of 686.8 kg ha^{-1} for eight months rearing period was recorded in the medium saline wetlands with species dominance of *P.monodon* >mullets >Tilapia > *L.calcarifer*, while the lowest production was recorded in the high saline wetland Radhakantapur with 286.3 kg ha^{-1} for ten months rearing period *(P.monodon > L. parsia > L. calcarifer > Tilapia).*

Mahanadi estuary

Water quality

The year was marked by two events of medium flash floods resulting in high river flows during July and August, with considerable soil erosion from the catchment and increase in sediment load. It was followed by extremely low base-flow during post monsoon through summer with high transparency and a state of stability.

The dissolved oxygen concentration varied widely both temporally and spatially. Well marked D.O stratification (9.2 - 4.8mg l^{-1}) leading to hypoxic conditions in deeper waters of lower estuary occurred frequently in post-monsoon and summer while periods of super saturation occurred in the freshwater zone.

Biological status

About three-fourths of the river-end estuarine stretch was found to be dominated by heterogenous population of freshwater plankton while the brackishwater habitat harboured a mixed population of freshwater *Oscillatoria, Spirogyra, Anabaena, Navicula, Synedra*, Cyclops, *Diaptomus* and brackishwater *Coscinodiscus, Pinnularia, Tetraedon, Chaetoceros, Surirella* planktonic organisms. Bimodal peaks of planktonic organisms was conspicuous in observations one during pre-monsoon at the freshwater stretch and another during post-monsoon in the brackishwater zone.

The benthic population in the brackishwater tidal zone comprised fresh and brackish water species of molluscs and crustaceans. Anoxic conditions at the bottom arising from accelerated decomposition of organic debris in early summer led to mass mortality of benthic organisms in the deeper and semi-stagnant brackish water stretch.

Fishery status

The gillnet catch over a period of 12 months showed that about nine species accounted for 90% of total number and 48% of total hauled fish biomass. The catch in decreasing order of abundance comprised *M. cephalus* (18.4%), *Liza parsia* (15.3 %), *L. calcarifer* (10.6 %), *T. ilisha* (9.7 %), and miscellaneous species (46.0%).

View of Mahanadi estuary

The analysis of catch data showed that the brackish water tidal zone of the estuary was the most productive area followed by the deep riverine zone and the freshwater tidal stretch.

View of Mahanadi estuary

Recruitment of larvae and post-larvae of fishes, prawns and crabs showed that the abundance of the early recruits was comparatively more in the brackishwater tidal zone. The fish availability in the estuary is found to be moderately abundant.

SABARMATI ESTUARY

S.N. Singh, V. Kolekar, B.L. Pandey R.C. Mandi, R.K. Sah, Subrata Das, T.K. Halder

Sabarmati estuarine system has been assessed from environmental perspective with status of abiotic and biotic components indicated as follows:

Water and Sediment Quality

The water temperature fluctuated between 18.5 to 33.0°C with water transparency varying from 9.0 to 75.0 cm. The pH fluctuated from 6.4 to 8.1. The D.O. level varied from nil to 10.2 mg l^{-1} for the system as a whole coupled with high free CO_2 (nil to 120.0 mg l^{-1}) revealed the status of estuary to be stressed.

Primary production: The gross production for Sabarmati estuarine system varied from nil to 250.0 mg C m^{-3} hr^{-1} and the net production fluctuated from nil to 187.5 mg C m^{-3} hr^{-1}. This reflected that the production functions in the estuary are under environmental stress.

Biological status

Qualitative and quantitative assessment of net-plankton was undertaken with the view to explore its spatio-temporal dynamics prevailing at different representative centres. The average planktonic abundance of Sabarmati estuarine system as a single entity varied from 301(Engoli) to 822 u l^{-1} (Indira Bridge) in which phytoplankton varied from 78.33 to 98.42%.The group-wise contribution was bacillariophyceae(46.88 to 81.75%) followed by myxophyceae and chlorophyceae. The zooplankton assemblage (1.58 to 21.67%) was mainly comprised of rotifera and copepoda.

The average macro-benthic abundance of Sabarmati estuarine system varied between 309 (Anandpura) to 2274 u m^{-2} (Engoli). Chironomid larval forms were most prevalent at Anandpura, Vataman and Indira Bridge while *Tubifex* sp. was dominant at Engoli and Paladi sites reflecting the enriched zone of the estuary.

RESERVOIR FISHERY

ECOLOGY AND FISHERIES OF FRESHWATER RESERVOIRS

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Kabini reservoir (Karnataka)

It is situated on river Kabini, a major tributary of Cauvery at Sargur in Mysore district.

Chemical Status

Water temperature fluctuated from 22.526.0°C, pH from 7.2-8.7 and specific conductance from 40 to 130 S cm^{-1}, dissolved oxygen from 5.8-6.8 mg l^{-1}. The hourly gross production varied widely from 94.5-367.2 mg C m^{-3} hr^{-1} and net production from 68.5-198.34 mg C m^{-3} hr^{-1}. Phosphate values ranged from 0.073 - 0.80 mg l^{-1}, nitrate from 0.113-0.216 mg l^{-1} and silicate from 6.1-8.8 mg l^{-1}.

Biological status

Plankton: Cyanophyceae (42.13%) dominated the phytoplankton community with *Microcystis* (42.3%) was the most dominant species in the reservoir followed by *Ulothrix* (19.92%) of chlorophyceae. Among zooplankton, copepod dominated (35.04%) with cladocera (16.79%) and protozoa (1.46%) also being encountered.

Periphyton: The periphyton density ranged between 430 and 1850 u cm^{-2}. The chlorophyceae (*Spirogyra* sp. and *Ulothrix* sp.) contribution was very meager (3.16 %) but bacillariophyceae was the dominant group (96.84 %) in the community.

Benthos: The fauna in Kabini reservoir fluctuated from 15 to 535 u m^{-2} with maximum abundance noticed during August and September.The chironomid larvae and mayfly nymphs along with gastropods were recorded in all the months.

Fish yield and biodiversity

An estimated fish catch of 45 t was recorded in Kabini reservoir during the period from July 2004 to March 2005. The highest monthly catch of 11.5 t was recorded in September 2004 whereas the lowest catch of 2.1 t was in the month of August 2004. The fishery in the reservoir was dominated by *O. mossambicus* (37.5%) followed by *O. bimaculatus* (20.5%), *C. carpio* (19%), *C. reba* (12%), *L. rohita* (3%), *N. notopterus* (2.5) and others (5.5%). The catch per unit effort (CPUE) was estimated at 5.3 kg $unit^{-1}$. During the first week of March 2005, the reservoir was stocked with 2950 catla and 2835 rohu seed which were reared in the cage culture experiment at Kabini reservoir.

Fish biodiversity: Forty seven species of fishes belonging to 10 families - Cyprinidae, Bagridae, Balitoridae, Ambassidae, Channidae, Heteropneustidae, Siluridae, Sisoridae, Mastacembelidae and Cichlidae have been recorded from Kabini river.

Cage culture

Cage experiments revealed that the catla seed grew from 4.8 cm to 7.3- 8.0 cm in length and from 1.4 g to 4.3 - 5.6 g in weight. While the rohu grew from 5.2 cm to 7.6 - 7.8 cm in length and from 1.4 g to 4.3 - 4.7 g in weight in a period of 100 days. The survival rate was high and varied from 57.1 to 73.0% in catla and 52.2 to 66.7% in rohu. The fingerlings were very healthy and a total of 2950 of catla and 2835 of rohu were released into the Kabini reservoir as a part of fishery enhancement strategy.

A view of the cages in Kabini reservoir

Harvested fingerlings of rohu reared in cages

Other Karnataka reservoirs

Chemical status

The pre- monsoon and monsoon surveys were conducted during the year 2004, in ten reservoirs of different agro-climatic conditions in Karnataka viz., Kanva (Bangalore rural district), Boranakanive and Gayathri (Chitradurga district), Jambadahalla (Chickmagalur district), Votehole (Hassan district), Shantisagar (Davangere district), Anjanapura and Gajanur (Shimoga district), Varahi and Chakra (Udupi district).

During pre-monsoon, water level was less than 1m in Kanva, Anjanapura and Shantisagar and transparency was very low (<0.5 m) due to inorganic turbidity. Hence, the euphotic zone was shallow. Chakra and Varahi had very high transparency (>4.0 m) without much turbidity. The transparency was in the medium range (1.5-2.5 m) in the rest of the reservoirs.

The gross primary production (GPP) was very low in Chakra and Varahi (56.25 mg C m^{-2} hr^{1} and 91.25 mg C m^{-2} hr^{-1}) even though the euphotic zone was very deep. In Kanva, Anjanapur and Shantisagar, although the GPP was low (37.5 to 89.0 mg C m^{-2} hr^{-1}), the community respiration formed a significant proportion of GPP. Votehole, Tunga and Gayathri recorded GPP in the medium range (135.8 to 140.7 mg C m^{-2} hr^{-1}). Jambadahalla and Boranakanive also exhibited medium values of GPP (135.8 to 140.7 mg C m^{-2} hr^{-1}). The net production was minimum in Anjanapura (9.4 mg C m^{-2} hr^{-1}) and maximum in Tunga (117 mg C m^{-2} hr^{-1}). The community respiration (CR) varied from a low of 10 mg C in Chakra to a high of 84.3 mg C m^{-2} hr^{1} in Kanva.

Biological status

Among the four groups of phytoplankton, chlorophyceae was most dominant and was represented by eight forms of which *Ulothrix* and *Spirogyra* were predominant. Chlorophyceae was the most dominant group in Kanva (460 u l^{-1}) and Tunga (170 u l^{-1}), which comprised mainly *Ulothrix* sp. *Ulothrix* sp. was recorded from all reservoirs except Shanthisagar. Myxophyceae dominated in Gayatri (288 u l^{-1}) where *Microcystis aeruginosa* was the most dominant species. *M. aeruginosa* was the only species recorded in all reservoirs except in Shanthisagar, Anjanapura and Tunga. *Ceratium hirudinella* was encountered among dinoflagellate group (80 u l^{-1}) in Votehole reservoir. Zooplankton presence was noticed in all the reservoirs among which copepoda was the most dominant in Boranakanive, Varahi and Jambadahalla. More rotifers were recorded from Kanva (228 u l^{-1}) and Gayatri (60 u l^{-1}) while protozoans were encountered in Kanva.

Fishery status

Tunga Anicut : Fishery in this reservoir was dominated by L. fimbriatus (47.0%), P. kolus (15.4%), O. bimaculatus (5.0%), A. aor (2.7%) and others (29.9%) consisting of M. cavasius, N. notopterus, M. armatus, and C. reba.
Anjanapura : O. bimaculatus, P. kolus, O.cotio, C. reba, M. cavasius, and Salmostoma novicula are the commonly found species in the reservoir.
Chakra and Varahi : The catch includes mainly M. cavasius, O. bimaculatus, Wallago attu, murrels among others.
Shantisagar: The catch consisted of minnows and forage fishes, S. novicula, P. ticto, A. ranga among others.

Mettur Reservoir (Tamil Nadu)

Chemical status

Soil pH at the lotic, intermediate and lentic zones remained alkaline and never declined below 7.2 at all depths. Specific conductivity ranged from 0.064 to 0.123 μ mhos cm^{-1}. The nitrogen content of the soil showed medium productivity and it was comparatively lower (25.3 to 31.73 mg $100g^{-1}$) at lotic than at lentic zone (28.73 to 33.5 mg $100g^{-1}$). The available phosphorus content ranged from a very low of 0.081 mg $100g^{-1}$ to 0.710 mg $100g^{-1}$.

The annual difference in temperature of water was minimal at Mettur reservoir (2.2°C). Transparency was lower (55.0 cm) at lotic zone and relatively higher at lentic (88.0 cm) and intermediate zone (86.5 cm). Water pH was alkaline at all zones. (7.3-8.2). The surface and middle layers of water at lotic and intermediate zone, contained high amount of oxygen (6.82 to 7.6 mg l^{-1}) but the bottom layer showed lesser oxygen content (4.1 to 4.43 mg l^{-1}). The phosphorus content in water was only in traces, while nitrogen content ranged from 0.091 to 0.270 mg l^{-1}. Silicate content was up to 6.5 mg l^{-1}.

Biological status

The plankton population was very low in this reservoir. The total plankton ranged from 48 u l^{-1} in April and was highest in August, 328 u l^{-1} in lentic zone. In intermediate zone the lowest was 40 u l^{-1} in May and the highest was recorded in August being 1414 u l^{-1}. Bottom fauna in Mettur reservoir varied from a low of 825 u m^{-2} in September to a high of 31450 u m^{-2}.

Primary production: The gross production of carbon was 160.8, 120.8 and 113.6 mg C m^{-3} hr^{-1} at surface, 1.0 m and 2.0 m depths, respectively in lentic zone. The intermediate zone recorded the gross primary production of 153.9, 140 and 101.3 mg C m^{-3} hr^{-1} and for the lotic zone 123.8, 108.4 and 43.4 mg C m^{-3} hr^{-1} at 1.0m, 2.0m, and 3.0 m depth respectively. The net production of the surface water was 143.4, 113.4 and 93.0 mg C m^{-3} hr^{-1} in lentic, intermediate and lotic zones, respectively. The respiration ranged from 20.8 mg C m^{-3} hr^{-1} (lotic) to 75.6 (lentic) mg C m^{-3} hr^{-1}.

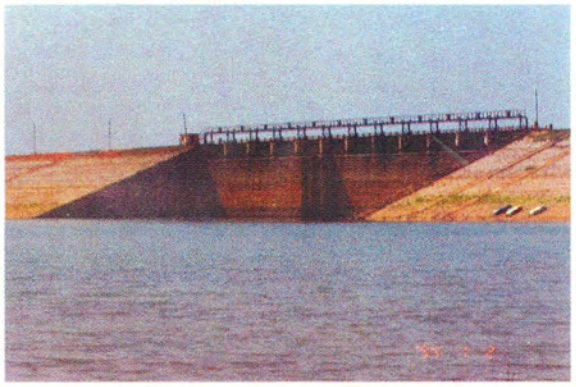
Fish yield

The highest fish harvest of 33654.6 kg was recorded during February 2005. During July, *Catla catla* brooders in ripe conditions were exploited heavily by fishers and made major contribution to the total catch, raising the total production to 21194.150 kg during the month.

RESERVOIRS IN UTTAR PRADESH

A.K. Laal, R.S, Panwar, H.P. Singh, D.N.Singh, R.N. Seth, R.K. Tyagi, B.K. Singh, P.N. Jaitly, K.D.Joshi, R.S. Srivastava, D. Karunakaran B.D. Saroj, S.K. Srivastava, J.P. Mishra, K. Srivastava

Investigations under the project was conducted on Dhandhraoul, Hinauti, Tanda and Chandraprabha reservoirs



Chandraprabha reservoir in Uttar Pradesh.

Chemical status

All the reservoirs were sandy loam, neutral pH and moderate to high in conductivity with low nutrient level. The pH of water ranged from 7.4 to 8.4.The specific conductivity ranged from 98 to 162 µmhos cm^{-1}, phosphate and nitrate ranges were (0.04 to 0.08 mg l^{-1}) and (0.07 to 0.09 mg l^{-1}), respectively.

Primary production: The gross production fluctuated between 300 to 900 mg C m^{-3} day^{-1} showing lowest production in Hinauti (winter season) and highest in Dhandhraoul (monsoon). All the reservoirs showed maximum gross production in monsoon season. The net production ranged from between 150 to 600 mg C m^{-3} day^{-1} respiration ranging from 175 to 630 mg C m^{-3} day^{-1}, depicting highest value in Chandraprabha (summer) and lowest during winter in Tanda reservoir.

(summer) and lowest during winter in Tanda reservoir.

Biological status

Plankton: Ranged from 380 u l^{-1} (winter) and 410 u l^{-1} (summer) in Dhandhraoul; 160 u l^{-1} (summer) and 3860 u l^{-1} (monsoon) in Hinauti; 200 u l^{-1} (summer) and 2304 u l^{-1} (monsoon) in Tanda and 290 u l^{-1} (winter) and 624 u l^{-1} (monsoon). The periphyton ranged from 176 u m^{-2} to 1460 u m^{-2}. The biological status indicated that the reservoirs were productive.

Fish yield

The estimated yield varied between 2.0 to 10.5 kg ha^{-1} yr^{-1}. The highest harvest as per records of lessee during last year up to June 04 from Dhandharoul was 10.5 ton, followed by Chandraprabha (7.0 ton), Tanda (3.0 ton) and Hinauti (2.0 ton). The small sized fishes also contributed to total catch of about 0.50.6 ton $year^{-1}$ in the Dhandharoul reservoir. Indian major carps formed the major components in fish production of the reservoirs. Catla dominated in Tanda (40%) and Dhandharoul (35%) reservoirs. Among other species, grass and common carp, cat fishes (*Aorichthys* sp.), *Channa* sp. and *Wallago attu* were also harvested in lesser quantity. The reservoirs were being regularly stocked with major carps and exotic carp seed.

On the basis of energy flow studies the fish production potential of Hinauti, Dhandharoul, Chandraprabha and Tanda were estimated at 110.5,127.0,119.0 and 85.0 kg ha^{-1} yr^{-1}, respectively. The actual fish production from these reservoirs was 2.0,10.5,7.0 and 3.0 kg ha^{-1} yr^{-1} and therefore, almost 1.8,8.3,5.9,3.5% of the potential is actually harvested. Thus there is a big gap between potential and actual fish harvest, which has to be abridged, and the reservoirs need to be optimally stocked for increasing fish production.

RESERVOIRS IN RAJASTHAN

V.K. Sharma C. Lakra, Sushil Kumar, Kuldeep Singh

Ecological investigations with major thrust on evaluation of productive potential of three small reservoirs viz. Ramsagar (722 ha) in Dholpur district, Needar (800 ha) and Mamchari (400 ha) in Karoli district of Rajasthan was conducted on seasonal basis.

Chemical status

These are shallow systems and the mean depth varies from 4 to 5 m. The basin soil is sandy to loamy and alkaline with pH ranging 7.64-7.94. The organic carbon was in moderate range varying between 0.28% (Ramsagar), 0.43% (Needar) and 0.26% (Mamchari reservoir). The available phosphorus was moderate. Water was alkaline with pH 7.63-8.42 and specific conductance ranged from 215.01-357.60 µmhos cm^{-1}.

Primary productivity: The average gross production (GP) was 1312.44 mg C m^{-3} day^{-1} for Ramsagar, 9042.24 mg C m^{-3} day^{-1} for Needar reservoir and 1666.68 mg C m^{-3} day^{-1} for Mamchari reservoir. The assimilation efficiency was in the range of 55.87-60.99%, which exhibited productive nature of the reservoirs.

Needar reservoir in Rajasthan

Biological status

Plankton: The average density of planktonic population was lowest in Needar reservoir (1312 u l^{-1}) and maximum in Mamchari reservoir (1757 u l^{-1}).

Periphyton: Mamchari reservoir was rich in periphytic communities with density of 3637, followed by Needar (2497) and Ramsagar (2263 u cm^{-2}).

Macrobenthos: The standing crop of benthic organisms was maximum in Needar reservoir with 1783 organisms m^{-2} and biomass of 19.90 g m^{-2}

Macrovegetation: Submerged, free floating and marginal macrophytes were encountered in all the three reservoirs. In Ramsagar reservoir an average of 2.166 kg m^{-2} of wet biomass and 0.208 kg m^{-2} dry wt. of macrophytes were recorded

Fish yield

The present production status of these reservoirs indicate that they are under utilized, as their productive potential (kg ha^{-1}) on the basis of carbon assimilation has been estimated at 204 kg ha^{-1} yr^{-1} for Ram sagar, 170 kg ha^{-1} yr^{-1} for Needar reservoir and 276 kg ha^{-1} yr^{-1} for Mamchari reservoir. All the three reservoirs fall under the medium productive category.

Fish production was maximum in Mamchari reservoir during 2004-05 (138.75 kg ha^{-1}) and least in Needar during 2003-04 (17.82 kg ha^{-1}). It has been reported that in addition to *Catla catla, L. rohita, C. mrigala*, catfishes- *W. attu, A. seenghala* and murrels form the fish biomass. Minor carps like *P. sarana, O. cotio, S. bacaila, Ambassis nama, Trichogaster fasciatus* and *Bachydanio rerio* were recorded in the reservoir.

These reservoirs are categorized as medium productive reservoirs, where stocking of Indian major carps @ 900 advance fingerlings ha^{-1} are suggested. Periodic harvesting of fish with size range restriction in use of nets is recommended for achieving optimum fish yield.

EXOTIC CARPS STATUS IN HIMACHAL PRADESH RESERVOIRS

V.K. Sharma C. Lakra, Sushil Kumar, Kuldeep Singh

Gobindsagar reservoir (Sutlej river), located in the district of Bilaspur, was studied. Gobindsagar used to be a reservoir with Indian major carps (catla, rohu and mrigal) as dominant population alongwith mahseer (*Tor putitora*) and indigenous minor carps like *L. dero, L. dyocheilus, L. bata* and *C. reba*, but all these species have declined to alarmingly low level after silver carp established foot-hold in 1976-77 and followed by *C. idella.*

Chemical status

The physico-chemical characteristics showed that air temperature ranged between 15.0-37.0°C and water temperature 9.0-27.0°C with transparency in the range nil to184.0 cm. pH of water was in the range of 7.2-7.6, D.O. in the range of 7.6-9.6; CO_2, 6.0-12.0 mg l^{-1}; total alkalinity 72.0-80.0 mg l^{-1}, specific conductivity 192.0-23.0.0 mhos cm^{-1}. The impact of cold water of river Beas diverted through Beas Sutlej Link and river Sutlej is felt upto intermediate zone of the reservoir, which nourish the young ones of silver carp.

Fishery status

A total of 928.08 t of fish was harvested from the reservoir during the period from all the 4 zones of the reservoir of which silver carp catch was (586.89 t) contributing 70.88% of total fish catch from the reservoir. Among the exotic carps, silver carp contributed 82.85% followed by *C. carpio*, 13.96%. *Ctenopharyngodon idella* was insignificant with 0.41% of the total fish catch.

Amongst Indian major carps *Catla catla* with 8.77% (72.66t) dominated the scenario followed by *L. rohita* 0.52% (4.34 t) and *C. mrigala* 0.09% (0.72 t). *Tor putitora* formed 1.94% (16.06 t) of total fish biomass. The Indian major carp group formed only 9.38% of total catch as compared to exotic carps, which formed 82.86% of the total. The scenario was totally different a few years ago and minor carps have declined drastically.

Length frequency distribution recorded from commercial catches show silver carp ranging in length from 440-875 mm with weight range of 2.250-5.600 kg, *Tor putitora* in the length range of 440-875 mm and weight range 0.500-5.800 kg, *L. rohita* 555 mm and wt. 1.900 kg, *C. carpio* in the range of 280-535 mm and wt. range 0.300-2.750 kg, *C. catla* 700-980 mm and wt. range of 4.00-14.0 kg. Thus exotic carps significantly altered the indigenous fish structure of this important reservoir in upland region of the country.

Catch of *H. molitrix* from Gobindsagar reservoir

FLOOD PLAIN WETLAND FISHERY

ECO-FRIENDLY MANAGEMENT NORMS FOR FISH PRODUCTION IN FLOODPLAIN WETLANDS OF INDIA

A. Mukherjee, Utpal Bhaumik, M. Choudhury, A. Hazra, M.A. Hassan, B.K. Bhattacharjee, Md. Aftabuddin, N. K. Barik, R.K. Manna, G.K. Vinci, K. Mitra, M.K. Bandopadhyay, P.K. Katiha, V.R. Suresh, Alok Sarkar, Sukumar Saha, K.K. Sarma, N.N. Majumder, D.K. Biswas, A. Mitra, S. Saha, B. Naskar

Stocking impact

Chumurdaha and Bhomra beels in West Bengal were stocked with *Catla catla*, *Cirrhinus mrigala*, *Labeo rohita*, *Ctenopharyngodon* idella and *Hypophthalmichthys molitrix*. Growth monitoring of fishes in these beels revealed the slope, in the case of *C. catla* and *L. rohita* maintained more than '3' deviating from cube law in Bhomra beel, where stocking density was low (11,100 no ha^{-1}), indicating better trophic and living conditions compared to their counterparts in Chumurdaha beel with very high stocking density (18,000 no ha^{-1}).

Impact of stock enhancement in the form of supplementary stocking was monitored in five beels of Assam. The beel Haribhanga was stocked regularly with seed of major Indian and exotic carps, whereas, supplementary stocking in other beels was irregular. The approximate share of stocked fishes to the total fish yield in the beels ranged from 20 to 50 %. Stocked fishes in Haribhanga beel contributed maximum to the fish catch.

Raising seed in cages

L. rohita reared in nylon net cages @50-100 nos m^{-2} installed in beels of West Bengal recorded a growth rate of 1217.7% and in *L. calbasu* it was (1019%) over the initial weight in 120 days of rearing.

Out of the two major carps, *L. rohita* reached 100 mm in cages within a month, the appropriate size for stocking in beel. The water quality inside the cages was not significantly affected. High plankton density recorded inside cages may be due to enrichment of water from the dissolution of left over supplementary feed in cage.

Cage culture in a Assam beel

Rearing of fry in cages up to fingerling size was carried in four beels of Assam. Stocking density was 500 fry (per cage) for *Catla catla, Labeo rohita, L. bata, L. gonius* and *Cirrhinus mrigala.* Bamboo barricade around the battery of cages safeguarded the cage from water hyacinth during flood. The fishes attained an average weight of 15-30 g in two months of rearing. Better growth was observed in case of catla in Morakolong beel. Catla, rohu, grass carp and silver carp appeared to be the most suitable species for stock enhancement in the beels, because of their fast growth and high consumer preference. Preference of the leassee and local seed availability influenced determination of the species ratio. The stocking density in the beels was 1333 no.ha^{-1}, which can be considered sub-optimal (5000 no.ha^{-1})

Ornamental fishes

About 85 fish species were recorded from four beels (Suguna, Chandania, Akaipur and Borti) of West Bengal. Of these, two species viz. *Puntius fraseri* Hora and Misra (Cyprinidae) and *Lepidocephalus caudofurcatus* Tilalk and Husain (Cobitidae) are new records from West Bengal.Sixty-four potential indigenous ornamental fish species from rivers, beels and landing sites were collected and documented. Out of which 14 are new additions to the documented list.

Economic analysis

Two beels (Chilron and Turkolia) located in East Champaran district of Bihar and other two (Chandania and Akaipur) in 24 Parganas (North) district of West Bengal were subjected to analysis. The institutional environment and co-operative spirit was better in West Bengal beels than in Bihar, due to better awareness among fishers about their rights and welfare, role of state fisheries department and better co-operative spirit. The better yield in West Bengal beels was due to adoption of culture-based fisheries, particularly stock enhancement options.

Economic analysis in beels of Assam indicated that the beel managers were benefited from growing IMC than exotic carps. The gains were higher when harvested at bigger sizes. There is gain in the value with the increase in

the sizes in all species but more so for catla, rohu and grass carp. The cost per ha of beel area varied between Rs. 5696/- to 10960/- with an average of Rs. 7631/-. The lease rent constituted the most important cost in the management (42.7%) followed by monitoring, demarcation or barrier and stocking with around 10 to 11 %. While the transaction cost, institutional cost, donation etc. combined, constituted 16.8 %. The intervention in the production process i. e. stocking, weed clearance, enhancement measures etc. constituted 34.8 % of the cost. The average return was Rs. 21,256 ha^{-1}. The total cost constituted 35.9% of return.

Haul of fish from pen culture in West Bengal

Pen culture adoption

The pen cultur demonstration was undertaken in March 2005 in 6 beels. These were Mathura beel, Kujerbagi beel, Jaleswar beel, Chumurdaha beel, Mustafapur beel and Kola beel, which are located in North 24 Parganas district of West Bengal. Carp seeds were stocked in the pens at a stocking density of 15000 nos ha^{-1}. Average initial weight of catla varied between 65.3 and 79.5 g, rohu 23.4 and 29.2 and mrigal 22.0 and 24.3. The records are satisfactory, it will test the inter-system variability on pen culture technology.

ECOLOGY AND BIODIVERSITY OF KAYAMKULAM LAKE

S. Bijoy Nandan, C. K. Vava, Usha Unnithan

The Kayamkulam lake is an important brackish water ecosystem on the south west coast of India. Regular monthly sampling and analysis were done in seven stations Viz. Ayiramthengu (AYT), Ayiramthengu- (Mangroves) (AYT- M), Valiyazhikkal (VHL), Kochiyudaejetty (KCJ), Keerikadu (KRJ), Choolatheruvu (CHT), Pulikeezhu (PKU).

Soil and Water Quality

The lake had low transparency and higher turbidity. pH was alkaline in all the study sites, except in Pulikezhu, where it was slightly acidic (av.6.94). The salinity regime fluctuated from 9.09 ppt in PKU to 18.76 ppt. in the marine zone, VHL. The dissolved oxygen was the lowest in CHT (av. 2.85 mg l^{-1}) and the highest in KRJ (av.6.32mg l^{-1}) The total sulphide and BOD_5 was high in the thermal discharge zone, CHT with 2.54 mg l^{-1} & 3.93 mg l^{-1} respectively, whereas the average BOD_5 for the lake was 3.40 mg l^{-1} and that for COD was 42.07 mg l^{-1}.

The acidic sediment was a characteristic feature in most of the stations except 3 stations. The sediment texture indicated that the fraction showed the highest percentage of fine sand followed by coarse sand, clay fraction and silt in all the study stations.

Primary production: The average gross primary production in the lake was 1.26 gC m^{-3} day^{-1} and the net productivity was 1.08 gC m^{-3} day^{-1}. The mean chlorophyll 'a' values varied from 0.716 mg m^{-3} to 2.45 mg m^{-3}.

Biotic Communities

The algal biomass for the lake was 1.10 g m^{-3}, with the highest value in February (1.64 g m^{-3}). The plankton biomass was generally low at seven stations of the Kayamkulam lake with average of 4.0 ml m^{-3}. The Kayamkulam lake was represented by 15 major groups of zooplankton from the 7 stations,

The benthic fauna were formed of 12 groups, dominated by polychaetes (32.44%) followed by Gastropoda (21.24 %), Amphipoda (15.0%), Oligochaeta (14.34 %) and Bivalvia (6.44%).

Fishery

During the period, 64 species of fishes, 7 species of prawns and 2 species of crabs formed the fishery of Kayamkulam lake. Genus *Etroplus* was represented by *E.suratensis*, and *E.maculatus*, Mullets by *Liza* spp, *Valamugil* spp., *Mugil* sp and genus *Ambassis* by *A.commersoni, A.nama.* Species wise, *E. suratensis* contributed the highest (61.21 t & 13.48%), followed by *Liza* sp. (35.07 t. & 2.78%) and *Arius* sp. (30.07 t. & 2.57%). The total fish and shellfish catch in the Kayamkulam lake during the present period accounted for 1087.77 tonnes.

It was interesting to note that the catch during December 2004, also comprised the marine species, *Sardinella longiceps* (0.2 kg), *Rastrelliger kanagurta* (63.55 kg), Pomfrets (3.4 kg) and the fresh water species, *Catla catla* (35kg), in the landing centers from the northern end of the lake. The CPUE exhibited wide fluctuations between the different gears for fishes and prawns during the present study. The high CPUE for trap (22.21 kg), followed by stake net (16.58 kg) was due to the indiscriminate fishing with fine meshes of the gear harvesting the juveniles of prawn and fishes.

ASSESSMENT OF ECOLOGICAL STATUS AND ENERGY DYNAMICS OF FLOODPLAIN WETLANDS IN CENTRAL AND WESTERN UTTAR PRADESH

Dhirendra Kumar, Shree Prakash, R.K. Tyagi, V. Pathak, R.S. Srivastava, B.L.Pandey, K.D.Joshi B.D. Saroj, J.P. Mishra, Saket Srivastava, Kalpana Srivastava

Studies were conducted in 4 jheels viz., Kidari (40.0 ha), Jaisagar (26.69 ha), Ratansagar (42.5 ha) located in district Mahoba and Karela (21.0 ha)located in district Lucknow.

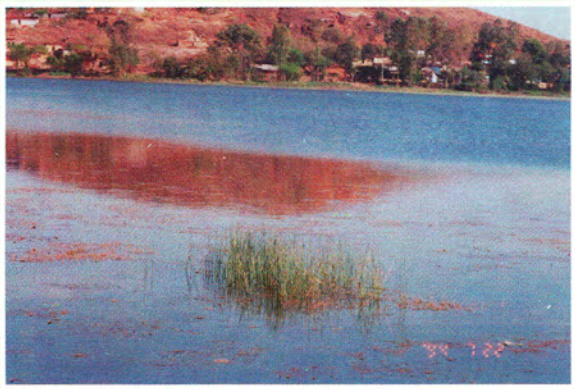
Soil and Water quality

Sediment was dominated by sand component in all the jheels (52.5-94.25 %), slightly acidic to alkaline in reaction (pH 6.63-7.3), rich in available nutrients (N-28.4-58.0 mg $100g^{-1}$, P- 1.24-10.0 mg $100g^{-1}$) and organic carbon (1.3-3.48 %). Water quality parameters viz. alkalinity, conductance, dissolved solids, calcium, magnesium and hardness showed considerable variations from 128.7- 214.2 mg l^{-1}, 311.0 - 438.0 µmhos, 155.7-219.0 mg l^{-1}, 26.6 - 44.4 mg l^{-1}, 14.1- 23.8 mg l^{-1} and 124.0 - 208.7 mg l^{-1}, respectively. Sediment and water quality in general reflected good productive status in all the jheels.

Primary Production: Gross and net primary production of jheels ranged from 2979.0 to 4047.7mg C m^{-2} day^{-1} and 1987.7 to 2495.07 mg C m^{-2} day^{-1}, respectively and almost 69.81 to 80.88% of gross production was assimilated by macrophytes.

Detritus energy: The energy deposited at the bottom in the form of organic detritus was 19.83 x 10^4 Cal m^{-2} day^{-1} in Kidari jheel, 12.67 x 10^4 Cal m^{-2} day^{-1} in Ratansagar, 14.14 x 10^4 Cal m^{-2} day^{-1} in Jaisagar and 21.13 x 10^4 Cal m^{-2} day^{-1} in Karela jheel.

Weed in festation in Jaisagar Jheel, U.P.



Kidrai Jheel in U.P.

Potential production

Based on the energy estimates, the fish production potential was calculated at 713.3, 697.0, 675.6 and 848.3 kg $ha^{-1}yr^{-1}$ in Kidari, Ratansagar, Jaisagar and Karela jheels, respectively. Thus all the jheels have high production potential.

The fish production potential as energy estimates ranged from 697.0 to 848.3 kg $ha^{-1}yr^{-1}$ but the maximum fish yield from properly stocked and managed Jaisagar jheel was recorded at 320.07 kg $ha^{-1}yr^{-1}$. The level can be enhanced upto a level of 700.0 kg $ha^{-1}yr^{-1}$ through judicious stocking management and control on infestations of macrophytes.

Fish yield

Group-wise species diversity of four jheels was Indian major carps (*Catla catla, Labeo rohita* and *Cirrhinus mrigala*), Catfishes (*Wallago attu, Clarias batrachus Heteropneustes fossilis,* and *Aorichthys seenghala*), Exotic carp (*Ctenopharyangodon idella, Hypopthalmichthys molitrx* and *Cyprinis carpio*) and among miscellaneous, *Channa striatus, C. punctatus, Labeo gonius, Tilapia mossambica, Puntius ticto, Rasbora daniconius, Amblypharyngodon mola, Osteobrama cotio* were recorded.

Maximum fish yield has been recorded from Jaisagar jheel (320.07 kg/ha) followed by Kidari jheel (46.44 kg/ha), Karela (9.42 kg/ha) and minimum being in Ratansagar jheel (0.70 kg/ha). Group-wise catch composition in terms of percentage in Jaisagar jheel was Indian major carps (31.68), exotic carps (34.20), miscellaneous fishes (27.14) and catfishes (6.98).

FISH HEALTH AND ENVIRONMENT MONITORING

HOLISTIC ASSESSMENT OF HEALTH AND RELATED BIOLOGICAL ASPECTS OF FISH AND INLAND AQUATIC ECOSYSTEMS

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Investigations were conducted in the river Churni at 5 sites and two beels Bansdah and Suguna on the environmental quality assessment of the ecosystems and fish integrity at the biochemical, organism and community levels.

Soil and Water quality

River Churni: The soil showed dominance of sand with pH (Avg.8.1), Specific conductivity (Avg 207µmhos), organic carbon (Avg. 0.27%), Available P (Avg 4.7 mg $100g^{-1}$). Heavy metal content recorded Zn (Avg. 39 mg g^{-1}) and Cu (25.6 mg g^{-1}). In water the mean values of various parameters was pH (7.6), alkalinity (267.0 mg l^{-1}), hardness (167 mg l^{-1}), Specific conductivity (457µmhos). The dissolved oxygen (3 mg l^{-1}) reached critical levels during winter and summer months (0.4 to 1.5 mg l^{-1}) due to release of sugar mill effluent. BOD (2.3 mg l^{-1}), Ammonia (0.006 mg l^{-1}) Heavy metal content recorded Cu (Avg. 6.5 ppb) and Zn (24.0 ppb).

Beels: The soil in both beels was sandy with acidic pH 6.1 in Bansdah and alkaline (7.5) in Suguna. Organic carbon was higher (4.5%) in Bansdah compared to Suguna (3.9%). Available phosphorus was more (4.6 mg l^{-1}) in Bansdah compared to Suguna (2.5 mg l^{-1}). Beel Water showed less transparency (58 cm) in Suguna as compared to Bansdah (124 cm). The specific conductivity was higher (329µmhos) in Suguna compared to Bansdah (285µmhos). Nutrients were poor in both the beels. Pesticide metabolites of DDT were higher than permissible limit (0.001 ppb).

Active monitoring of fish

The *insitu* experiments using *L. rohita* and *R. rita* in cages in River Churni for 30 days indicated hypochloremia, elevated level of creatinine, triglyceride and bilirubin, renal dysfunction, gill hyperplasia and proliferation of mucous cells. Study of index of biotic integrity (IBI)

recorded 37 species of fish, which have been grouped under the Habitat, Trophic and Tolerance guilds. At the more degraded sites,the species richness decreased along with the number of benthic species and herbivorous species. The number of omnivorous and tolerant species increased.

Economic Impact

Year	Fish Available	Operational Period	Income (Rs/day)
1980 to 1984	15-20 kg	1-3 hrs	200-250/-
1985 to 1990	10-15 kg	1-5 hrs	150-200/-
1991 to 1995	5-8 kg	8-10 hrs	150-200/-
1996 to 2000	2-3 kg	8-10 hrs	80-120/-
2001 to 2004	700-1000 gm	8-10 hrs	40-70/-

Plankton and Benthic status : No organic pollution was found in the surface and column layer of the riverine water body as the calculated Algal Pollution Index always remained below the safer level (0.0-6.0)

Stress Protein studies : Experiments were conducted on *L. rohita* for thermal stress studies for one month. Stress protein was expressed in all the tissues studied but higher in case of brain as compared to kidney, liver, gills and muscle.

Health status of fishes in beels : Comparative health status of carps in the two beels through blood studies showed elevated levels of creatinine and bilirubin in fishes of Bansdah beels compared to Suguna beel. It is indicative of the chronic environmental stress operating in Bansdah beel.

Clinical pathology and diseases in fish

Chemical stressors

L. rohita subjected to cumulative stress of sublethal level of cadmium (0.56mg l^{-1}) and low dissolved oxygen (4 mg l^{-1}) showed

- Decrease in haemoglobin, haematocrit and leucocrit and plasma chloride.
- Increase in plasma cortisol and glucose.
- Increase in plasma lactic acid.

Argulosis

- Morphological symptoms exhibited pale gill with ulceration, greater opercular movement (130 times sec^{-1}.) and enhanced mucus secretion.

- The physiological alterations showed decrease in haemoglobin, haematocrit, plasma protein and plasma cholesterol and enhanced plasma cortisol, glucose and creatinine levels.

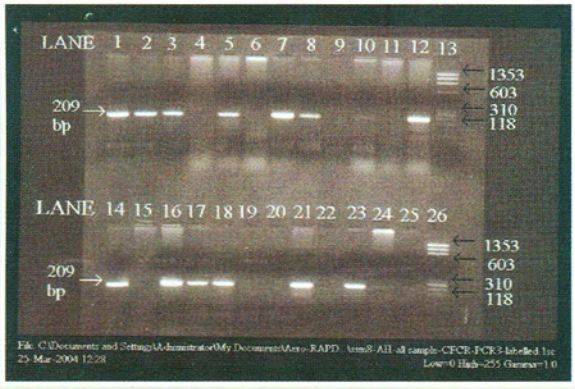
Microbial diseases

A total of 89 bacterial isolates were isolated out of which 56 isolates were identified from various investigation sites. *A.hydrophila* isolated from affected *C. mrigala* and *L. rohita* repeatedly tested pathogenic under laboratory condition when intraperitoneally injected in healthy *L. rohita* at different dilution for disease induction. Clinically the disease was observed after 24 hrs of infection. The physiological blood profile was investigated.

Molecular techniques for diseases diagnosis

Bacterial isolates obtained from diseased fish were processed using different cultural and biochemical tests to identify the pathogens. Different pathogens like *Aeromonas hydrophila, Aeromonas veronii* b.v. *Sobria, A. Vbronii* and *Vibrio* spp. were obtained. *Aeromonas* isolates were used for molecular characterization on the basis of their protein profile, genomic DNA restriction pattern and plasmid profile. Whole cell proteins and sonicated extracts of bacterial isolates were analysed on 11% SDS-PAGE. *Aeromonas* isolates revealed presence of 2-4 plasmids. RAPD analysis of plasmids was carried out using different OPA primers and polymorphism studied. RAPD-PCR based technique was used for differentiation of *Aeromonas* isolates using a number of random primers. Great variation in DNA banding pattern indicated a high genomic variation in *Aeromonas* isolates.

DNA polymorphism of *A. Veronii*, b. v. *Sobria*



Amplified DNA of 209 bp visualized

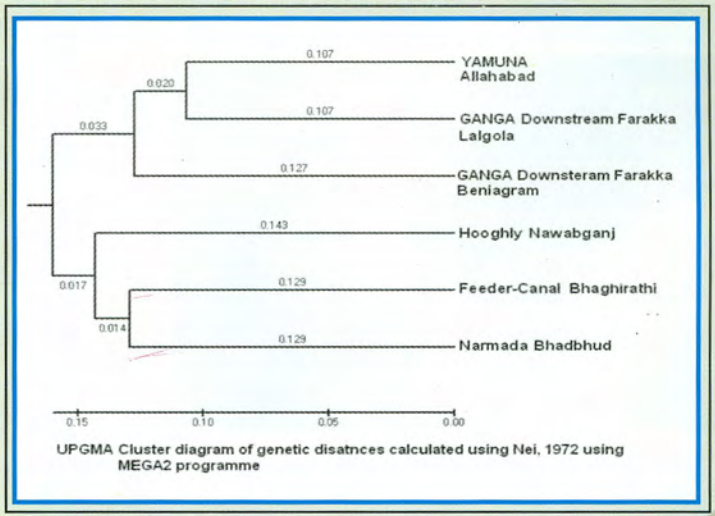
PCR was standardized and used for specific

detection of *A.hydrophila* DNA group1, 'aer' gene aerolysin positive *A.hydrophila* and virulent (enterotoxigenic, hemolysin gene positive) *Aeromonas* spp. from samples of fish. Primers specific for hemolysin gene (232 bp product) and 'aer' gene (209 bp product) were used as the target genes for PCR amplification. The results indicated successful detection of *A.hydrophila* and other virulent *Aeromonas* isolates. The amplified 232bp and 209bp product DNA fragments were eluted from gel and separately labeled *in vitro* using Alkphos direct labelling and detection system These were used as DNA probes for specific detection Aerolysin gene positive *A.hydrophila* and virulent (hemolysin gene positive) *Aeromonas* spp. from samples of fish, using DNA Dot-blot hybridization technique. Results indicated high sensitivity and specificity of labelled probes for detection of both *A. hydrophila* and virulent *Aeromonas* in tissue/ culture samples.

Genetic characterization and migration of *Tenualosa ilisha*.

Sample of *T. ilisha* were collected from river Yamuna at Allahabad, Ganga at Beniagram & Lalgola and at Nawabganj from Narmada at Bhadbhud and river Tapti at Ukai reservoir. The RAPD technique was used to decipher the population differences in the hilsa populations. RAPD fragments observed from the 96 samples analysed showed a high degree of polymorphism in between populations. Six primers produced 196 fragments in total, with 98.13 % polymorphic fragments. The number and sizes of scorable fragments varied from 1 to 18, with a size range of 1300 to 257 bp. The UPGMA dendogram clusters the Ganga-Padma samples in one group and the HooghlyMatlah samples in another group.

Cluster Diagram of *Tenualosa ilisha* populations

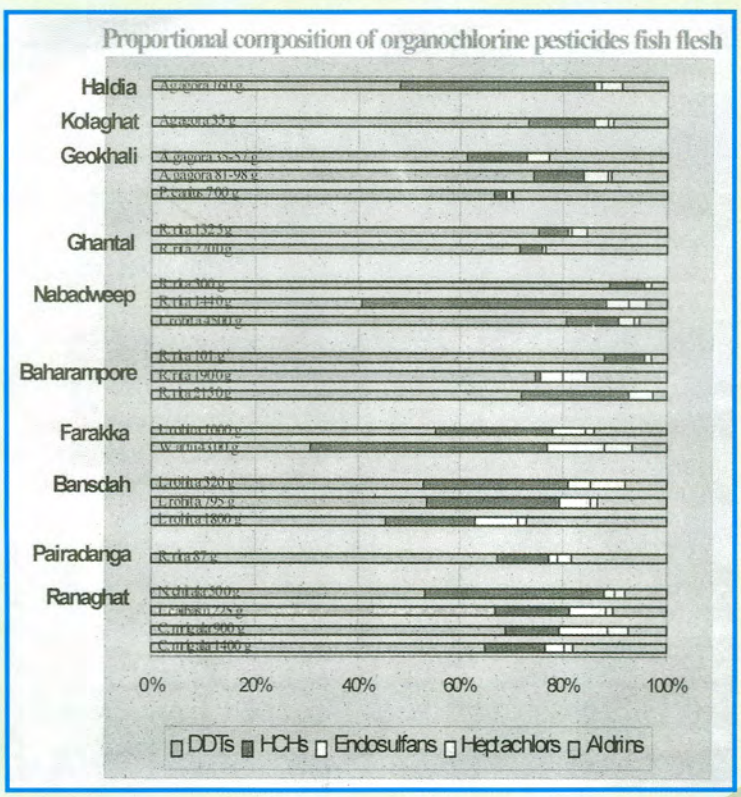


UPGMA Cluster diagram of genetic disatnces calculated using Nei, 1972 using MEGA2 programme

Metal and pesticide contamination

Heavy metals : Among toxic heavy metals (ppm), very low content of Cu was registered in water as well as in fish flesh of both the rivers. Cd was not detected in water with its feeble presence in fish flesh also. Though Mn, is not as toxic as Cu or Cd, its content was some what higher in sediment and fish flesh compared to Cu or Cd due to its presence in soil as an innate character of basin sediment. None of the heavy metals surpassed the safety limits as specified by EPA and FAO whether in water or in fish flesh samples studied.

Organochlorine pesticide residues : Water and fish samples analysed for monsoon season showed DDTs (i.e., DDT, DDE & DDD) predominant in total organochlorine residues followed by HCHs and Heptachlors in fish fleshes as well as water samples in both the rivers. Amongst DDTs, it was 4,4/ -DDD, contributed more than 70% in fish flesh and 60% in case of water samples. No correlation was observed between pesticide residues and body weight of fish species. Residues of DDT s in *Rita rita* weighing 101 g contained more residues (35.89 ppb), while it was 9.16 ppb in the same species weighing 2150 g. The residue was meager in fish flesh with respect to the permissible limits of these pesticides for human consumption. In water samples, 4,4/ -DDT was present in concentration higher than its permissible limits (EPA, USA) specified for aquatic organisms.



Other chemical characteristics

Sediment : Soil reaction was moderately alkaline in both the rivers with soil pH values at around 8.0 & 8.5 in Roopnarayan and Bhagirathi respectively. Organic carbon content was very poor in Bhagirathi (0.03-0.07%) compared to Roopnarayan (0.13-0.23%). C/N ratio was 6.2-13.2 in Roopnarayan compared to 3.5-8.0 in Bhagirathi.

Water : Spatio-temporal variations were significant in case of water transparency, conductivity, alkalinity as well as hardness in both the rivers and higher values of them were registered during post monsoon season. Transparency was low in Roopnarayan (14-25 cm). Water reaction was moderately alkaline in both the rivers (pH 7.2). Alkalinity was low (55-105 ppm) in Roopnarayan compared to Bhagirathi (113-128 ppm). Free ammonia content was very low (0.007-0.019 ppm) in Roopnarayan and 0.009-0.025 ppm in Bhagirathi. Biological oxygen demand was low in the range of 0.6-1.6 and 0-1.0 ppm in Roopnarayan and Bhagirathi rivers respectively.

FISH RESOURCE ASSESSMENT

DATABASE DEVELOPMENT IN INLAND FISHERIES THROUGH REMOTE SENSING TECHNIQUES

R.A. Gupta, S.K. Mandal, D. Nath, Debabrata Das, S.K. Sahu Sucheta Majumder

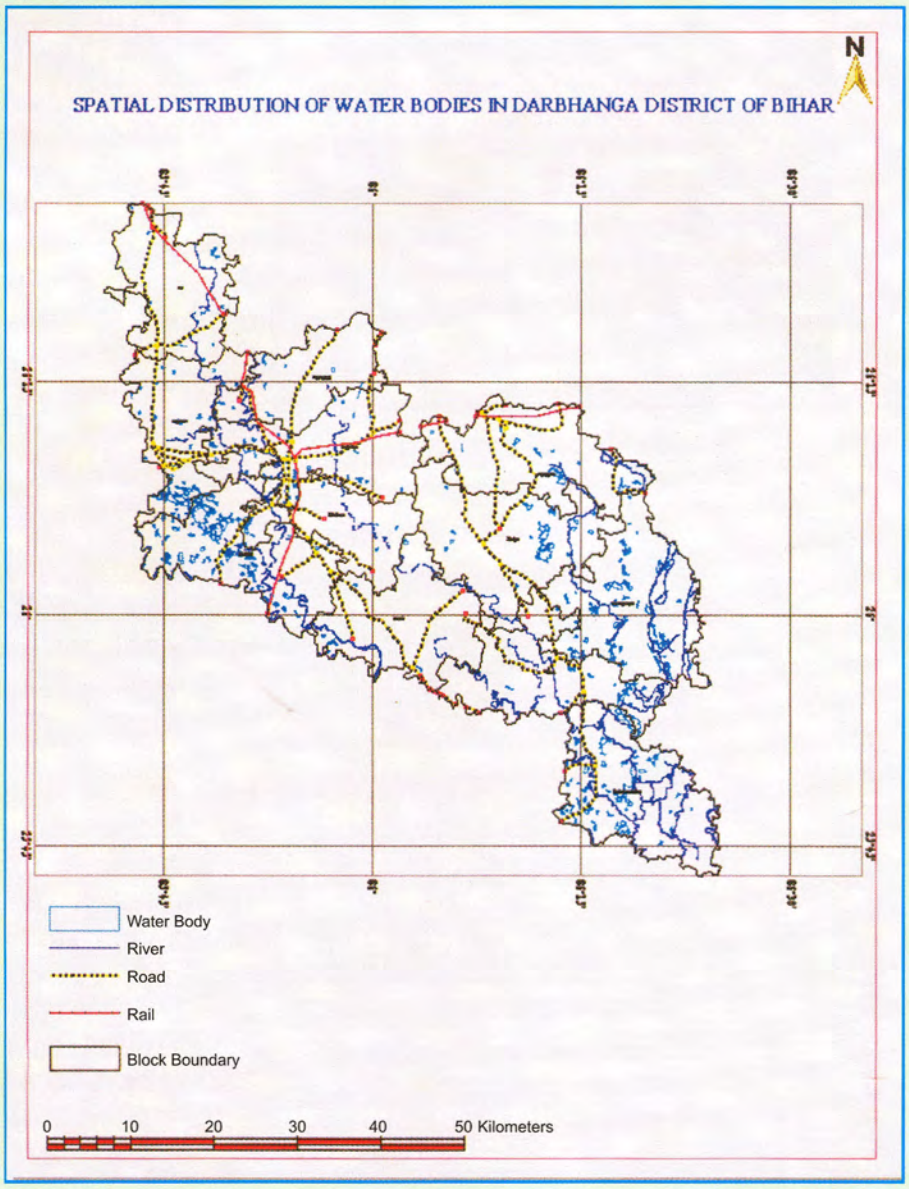
Evolving prediction models for resource management

District planning maps (DPMS) and SOI topographical sheets of the districts of Rajasthan procured from different Govt. agencies have been used for preparation of base maps. Digital base maps for all the districts of Rajasthan have been prepared.

Observations on water quality and soil characteristics were taken from twenty-four selected water bodies during pre-monsoon in the state of Rajasthan. The parameters of study were temperature, transparency, dissolved oxygen, specific conductivity, pH, total dissolved solid, total alkalinity, free CO_2, chlorinity, salinity, NO_3, total nitrogen, PO_4, sulphate, silicate, hardness, Ca, Mg, Gross Primary Production, Net Primary Production and Respiration. Observations on soil characteristics were made on sand, silt, clay, pH, sp.

conductivity, organic Carbon, total Nitrogen, available Phosphate, Free $CaCO_3$ and available-N. Since the cloud free satellite data could not gathered for the pre-monsoon period of 2004, the feasibility of development of model for prediction of water quality parameters has not been studied.

The mapping and inventory of water bodies above 10 ha area have been documented for Bihar state. The mapping of rivers and streams has also been completed in this state. Spatial data and information with regard to Bihar has been completed and a detailed database has been developed on GIS platform.



Database development on GIS platform

The fish catch data are being collected at various centers adopting multistage sampling and days of sampling are selected following systematic sampling. The data are analysed for working out the month-wise, species-wise and gear-wise estimates.

The estimated catch during February 04 to January 05 has been worked out at 64646 t for the Hooghly-Matlah estuarine system including the landings at Digha. The major contributory species are *Tenualosa ilisha* (13.0%), *Pama pama* (12.8%), *Harphodon nehereus* (11.7%) and *Setipinna* sp. (8.8%). The catch from the estuary excluding Digha has been estimated at 48196 t. The species mentioned above are the major contributors to the fishery. Various gears are operated in the estuarine system. However, the maximum catch (72.8%) comes from bagnet followed by drift gill net catch (23.0%). The catch from other gears is negligible compared to these nets.

Aspidoparia morar from R. Brahmaputra

The fish landings from the Bramhaputra river is recorded at Uzanbazar centre of Guwahati. Systematic sampling is followed in collection of data. The monthly species-wise catch estimates show that *A.morar* (13.7%), *C.reba* (12.3%), *L.bata* (11.9%), *L.dero* (8.5%) are the significant contributors to the fishery.

The estimated fish catch from Yamuna river during the period April, 04 to February, 05 recorded at four landing centers is worked out at 62.06 t and the catch from three landing centers of West Yamuna canal is estimated at 31.78 t. There is no significant contributory fish species. Miscellaneous species constitute the major part of the catch.

The total landing during January 04 to December 04 from Ganga river system at Allahabad is 156.46 t. The significant contributory species are *Mystus seenghala*, *Mystus aor* and *C.garua.*

The catch data from various centers have been stored in GIS platform for easy retrieval.

OTHER PROJECTS

- Strengthening of database and information networking for fisheries sector (Fisheries Division, Department of Animal Husbandry and Dairying, Ministry of Agriculture, New Delhi)
- Reservoir Fisheries Development in India (Fisheries Division, Department of Animal Husbandry and Dairying, Ministry of Agriculture, New Delhi)
- National Risk Assessment Programme for Fish & fisheries products for Domestic and International market. (ICAR Cess Fund)
- Biology and Fishery of Mahseers in the Upper stretch of Cauvery. (ICAR Cess Fund)
- Impact, Adaptation and vulnerability of Indian agriculture to climate change Effect of climatic change on inland fisheries. (ICAR Plan Project)

Project meetings in progress

5

TECHNOLOGY ASSESSED AND TRANSFERRED

CIFRI

TECHNOLOGY ASSESSED AND TRANSFERRED

EXTENSION ACTIVITIES

Advisory service

A total of 288 fish farmers/fishermen owning 273 ponds and bheries, 37 entrepreneurs, 40 extension functionaries/clientele were provided with solutions to their respective problems when they called on at Institute headquarters or over telephone or through letters or through farm visit.

Exhibition

The Institute organised and participated in different Exhibitions held in various parts of country with charts, blown-up photographs, posters/models etc to depict Institute's work and achievements.

- The Northeastern regional Centre participated in six-day long exhibition entitled "Fishing artisans of water-past traditions contemporary realities" from October 8-13, 2004 at the art gallery of the India International Centre, New Delhi. The CIFRI pavilion exhibited indigenous fishing crafts and gear like bamboo gear, electro-fishing equipment, models of fishing boat and nets, etc used in northeastern India (with a note on their mode of action).

- The Institute participated in the Exhibition cum Seminar at Institute of Engineering at Gokhel Road, Kolkata during September 2-3, 2004.

- The Institute participated in the Exhibition cum Seminar at Fisheries Science Congress

at New Delhi during November 4-6, 2004 to depict Institute's work and achievements through charts, posters etc.

- Participated in the exhibition organised by "10th Agriculture, Industry, Tourism and Science Festival" Baruipur, Midnapore form January 23-30, 2005 with charts, posters etc. to depict Institute's work and achievements.

- CIFRI, Alappuzha participated in the International Exhibition on Ornamental fishes at Kochi from 17 - 23, November, 2004.

CIFRI stall in exhibition at Kochi

CIFRI stall in exhibition at ICC, New Delhi.

Mass Awareness Campaign

- Organised a Mass awareness campaign on fish conservation at Malancha, South 24-Parganas on April 28, 2004.

- Organised an awareness campaign on conservation of Hilsa at Nandabhanga and Namkhana, Sunderbans on August 5, 2004.

Mass awareness programme on fish conservation for fishermen of Uttar Pradesh.

- Organised one Mass Awareness Campaign on July 11, 2004 at Frazerganj, Bokkhali towards conservation fishes of Sunderbans. About 155 fish farmers, entrepreneurs and other people those who are engaged in fishing in the estuarine areas of Sunderbans were motivated through the campaign.

- Organised an awareness campaign on conservation of brackishwater finfish and shellfish in the Village of Maanganj and Dakshin Shiborampur in South 24 Parganas district on October 15, 2004.

- Organised an awareness campaign on conservation of fish seed at Gadapukuria on November 18, 2004.

- Organised an awareness campaign on conservation of brackishwater seed of finfish and shellfish at Kolaghat, Purba Midnapore on November 19, 2004.

- Two mass awareness campaigns were organised along the river Bhagirathi near Farakka to stop illegal fishing of Hilsa juveniles through small mesh nets.

- CIFRI, Allahabad centre organised awareness Campaigns on conservation of riverine fish spawn and adult.

Mass awareness programme on fish conservation for fishermen of U.P.

6

EDUCATION AND TRAINING

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EDUCATION AND TRAINING

SUBJECTS	PARTICIPANTS	VENUE AND DATE
Conservation of finfish & shellfish	Fish farmers	Bokkhali, South 24-Parganas May 6-7, 2004.
Techniques of Data Collection for Fish Catch Estimation in Inland Water Bodies	State officials	Bangalore, during 13-14 May 2004 and on 29-30 December 2004
Responsible fishery under the banner of Tagore Society (Sunderbans)	60 fish farmers/ fishermen	Rangabelia June 8-10, 2004
Sampling methodologies for assessment of resources for various inland water bodies and catch under Central Sector Scheme.	State officials of Jharkhand, Sikkim, Orissa and West Bengal	CIFRI, Barrackpore 2-3 July, 2004
Entrepreneurship course on fresh water fish seed production and their management in collaboration with Ramakrishna Vivekananda Mission Institute of Advance Studies	Students and farmers	Kamarhati, Kolkata August 6-16, 2004.
Management of riverine Fish spawn for conservation of Indigenous fish stock of river Ganga	Fish farmers	Kanpur on18.8.04 and Varanasi on 26.8.04

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SUBJECTS	PARTICIPANTS	VENUE AND DATE
Empowerment of fisherwomen of Kanchrapara Fishermen Cooperative Society	Fisher women	Kanchrapara, August 25-28, 2004.
Spawn prospecting investigation	Fish farmers	Sujabad, Varanasi, 26 August 2004.
Role of Culture based fisheries and pen culture in Development of Reservoir Fisheries in India under the Pilot Project of Central Sector Scheme	Officials of the Department of Fisheries of U.P.,M.P., Bihar and Karnataka	CIFRI, Barrackpore 13 Sept. to 18 Sept 2004.
Mangrove basedAquaculture/ Agriculture/Ecology	Undergraduate students	Institute's Centre, Kolkata September 14-23, 2004.
Role of fisherwomen in management of Mathura beel, North 24 Parganas.	Fisher women	September 27-28, 2004
Sampling methodologies for assessment of resources for various inland water bodies and catch under Central Sector Scheme	State officials of Tripura	CIFRI, Barrackpore 27-28 September, 2004
Fisheries Management for enhancing fish yield from jheels	60 participants belonging to local fishermen cooperative societies, fish farmers and other beneficiaries of Kidari Jheel	Kidari jheel in the district of Mahoba (U.P.) on 27.10.2004.
Conservation of genetic resources of water bodies in Assam jointly organised by the AFDC and NBFGR	Beel managers of Assam	NER centre on 8 November 2004 .
Conservation of estuarine fin and shellfish and transportation of seed	38 nos. of interested fish farmer/ fishermen	Bokkhali, Sunderbans, South 24-Parganas December 22-23, 2004
Development of Inland Fisheries data base	Directors Fisheries' and their representatives of all Northeastern States	5th December 2004.
Emerging trends in coldwater fisheries research and development organised by NRCCWF, Bhimtal in collaboration with NER Centre CIFRI	Fisheries officers of NE India	6-10 December 2004

SUBJECTS	PARTICIPANTS	VENUE AND DATE
Breeding and maintenance ornamental fishes organised by MPEDA, in collaboration with CIFRI, Barrackpore	Entrepneuers, fish farmers	4-6 January 2005.
Cage culture	Officers of State fisheries department	at Kabini reservoir site.5th January 2005
Methodology for estimation of water resources and catch assessment under centrally sponsored scheme "Strengthening of database andinformation networking for fisheries sector"	State Govt. officials of Uttar Pradesh, Madhya Pradesh, Chattisgarh, Himachal Pradesh and Uttaranchal	Barrackpore, 31st Jan 05.
Mangrove based aquaculture, agriculture and rural employment generation technologies	Students of colleges	Kolkata Research Center of CIFRI, 14 FEB-19 FEB 2005.
Pen culture operation	Fish farmers	Kujerbagi Tribal Fishermen Cooperative Society 10.3.2005
Collection of spawn, site selection, closed season, mesh size regulation and rearing of spawn.	Fishermen	Varanasi
Management of Jheels of Charkhari area for enhancing Fish Production	Fish farmers	Charkharil, Dist. Mahoba (U.P.) on 15.03.2005.

Training programme in Rangabelia, W.B.

Training cum demonstration of cage culture at Kabini reservoir

Training programme at Kujerbagi, W.B.

Training abroad

Subject	Scientist	Place visited
Impact of temperature changes secondary and tertiary stress levels by molecular biology techniques (Proteomics).	Mr.Praveen Maurya,	University of Louisville, Louisville, Kentucky, U.S.A. From 7.6.04 to 4.9.04
Molecular Genetics of Fishes	Mr. Manoj P.Brahmane,	University of Hull, Hull, United Kingdom From 12.1.04 to12.4.04
Aquaculture	Dr.Biswajit Dash,T-4	Nigbo University, China from 1.9.04 to15.5.05

Training programmes

7

AWARDS AND RECOGNITIONS

CIFRI

AWARDS AND RECOGNITIONS

- Dr. Md. Aftabuddin Scientist was awarded Ph.D degree by IVRI, Izatnagar, Bareilly, Uttar Pradesh.
- Mr. M. Roy of CIFRI bagged the 'Best Athelete' Award of the ICAR Zonal Sports Meet Zone III held during January 14-18, 2005 at kolkata.
- Mr. P. Muraleedharan, U.D.C. of this Centre received one individual Gold Medal, three Silver and one bronze medals. He also received one gold medal as a member of 4 x 100m relay team at the Zonal Meet held at CRIJAF Kolkata during January 14- 18, 2005 at Kolkata.

8

LINKAGES AND COLLABORATIONS

CIFRI

LINKAGES AND COLLABORATIONS

- CGIAR Challenge Programme on Water and Food (CPWF) project "Improved fisheries productivity and management in tropical reservoirs"(World Fish Center, Penang, MALAYSIA)

- CGIAR Challenge Programme on Water and Food (CPWF) project "Community-based fish culture in seasonally flooded rice fields in India" (World Fish Center, Penang, MALAYSIA)

World fish centre project workshop

- Achieving greater food security and eliminating poverty by dissemination of improved CARP strains to fish farmers in India (World Fish Centre, Penang, MALAYSIA)

- Strategies and options for increasing and sustaining fisheries and aquaculture production to benefit poor households in Asia (ICAR-ICLARM)

- Linkages have been made with National Remote Sensing Agency, Hyderabad to procure satellite maps. The help of Survey of India, Kolkata and NATMO, Salt Lake, Kolkata has been taken for using their wetland and other maps. The Department of Animal Husbandry and Dairying, Govt. of India has approved a project on "Strengthening of Database and Information Networking for Fisheries Sector". The Institute will provide guidance to the states/UTs in estimation of resource and catch for various inland fishery resources. The Institute also develops Geographical Information System (GIS) on inland water bodies under the project.

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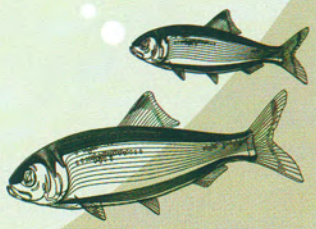
PUBLICATIONS

CIFRI



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LIST OF ON-GOING PROJECTS

CIFRI

LIST OF ON-GOING PROJECTS

Title of the project	Project leader	Year of Start	Likely date of completion
Assessment of ecology, biodiversity and production potential of Indus river system	Sh D.N Mishra	April 2002	March 2005
Evaluation of habitat degradation in the context of fisheries ecology in river Ganga	Dr. R.S. Panwar	April 2001	March 2006
Studies on the estuarine ecosystems and saline wetlands of Eastern India in relation to their production potentiality	Dr. D. Nath	April 2003	March 2008
Dynamics of biotic communities of certain estuarine systems from environmental perspectives	Dr. S. N. Singh	April 2004	March 2006
Ecology and fisheries of freshwater reservoirs	Dr. D.S. Krishna Rao	April 2002	March 2007
Eco-status and production potential of selected reservoirs of Uttar Pradesh	Dr. A. K. Laal	April 2002	March 2005
Ecology and fisheries of small reservoirs of Rajasthan	Dr. V.K Sharma	April 2002	March 2005
Exotic carps status in the reservoirs of Himachal Pradesh	Dr. V.K Sharma	April 2004	March 2007

Title of the project	Project leader	Year of Start	Likely date of completion
Development of eco-friendly management norms for enhancing fish production in floodplain wetlands of India in relation to their resource characteristics	Dr. A. Mukherjee	April 2002	March 2007
Ecology and biodiversity of Kayamkulam Lake	Dr. S. BijoyNandan	April 2002	March 2005
Assessment of ecological status and energy dynamics of floodplain wetlands in Central and Western Uttar Pradesh	Dr. Dhirendra Kumar	May 2002	March 2005
Holistic assessment of health and related biological aspects of fish and inland aquatic ecosystems	Dr. Manas Kumar Das	April 2000	March 2008
Inventory of resource and database development in inland fisheries through Remote Sensing Techniques	Shri R.A. Gupta	April 2002	March 2007

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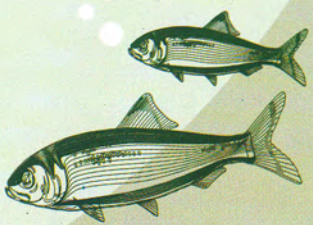
CONSULTANCIES

CIFRI



CONSULTANCIES

Title	Sponsoring Organisatioon	Period
Assessment of fish yield potential of Chilka Lake	Chilka Development Authority	July 2003.
Rapid sustainability assessment of schemes completed under the farmers' pond development component of ARIASP'	Assam Rural Infrastructure and Agricultural Services Project (ARIASP) Society, Guwahati, Assam.	July 2004.
'Design of fish pass facilities for the dams of Kameng Hydro Electric Project, Arunachal Pradesh'	North Eastern Electric Power Corporation Ltd.	November 2004.
Fish conservational and hydrobiological perspectives of River Narmada with reference to Sardar Sarovar Project"	Government of Maharashtra	2002, continuing
Feasibility Studies for Fish Production Enhancement in Selected Reservoirs of Gujarat State	The Commissionerate of Fisheries, Government of Gujarat	March 2001, continuing

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MEETINGS

CIFRI

12 MEETINGS

Management Committee

The Institute Management Committee Meeting was held at Barrackpore on 25.09.2004 under the Chairmanship of the Director CIFRI.The committee discussed the action taken on the previous meeting and new agenda items were discussed in detail and approved according to importance of the items. The following members of the committee attended the meeting - Dr. V.R. Chitranshi, ADG (Fy), Shri Shiv Sankar Saini, Darbhanga, Bihar, Dr. H.C. Joshi, Pr. Scientist IARI, New Delhi; Dr. (Mrs) Meena Kumari B. Pr. Scientist CIFT, Kochi; Dr. R.K. Jana, Pr.Scientist CIFA and Shri H.K. Samadder F & AO, CRIJAF.

Annual Staff Research Council

The Annual Staff Research Council meeting of the Institute was held on 12-13 April 2004.Dr. D. Nath, Actg. Director chaired the meeting and Dr.V.R.Chitranshi ADG (Fy) represented the Fisheries Division, ICAR.Progress achieved under all the research projects of the Institute was presented by respective project leaders. After elaborate deliberations future project programmes for 2004-2005 were accorded approval.

Research Advisory Committee

The Research Advisory Committee of the Institute met at Barrackpore on 24-25 January 2005 under the chairmanship of Dr. K.V. Devaraj, former V.C., University of Agricultural Sciences,

Bangalore. The following members constitute the committee Dr. B.N.Singh, Ex-DDG (Fy), Dr. V.R. Desai, Ex-Director CIFRI, Prof. B.B. Jana, Kalyani University, Dr. Amalesh Chowdhury andDr.P.S. Roy, Dean, Indian Institute of Remote Sensing, Dehradun.All Heads of Divisions and Scientists of the Institute participated in the deliberations. The committee expressed the view that future work programmes should emphasize on developing time bound protocol for large, medium and large reservoirs; seed rearing in cages and pens under different agroclimatic conditions; standardizations of safe levels of contaminants in aquatic ecosystems; study of microbial load to assess extent of anthropogenic stress in rivers.

Joint Staff Council (IJSC)

The members of constituted IJSC body which functioned during 2004-2005 is given here under :

Official side			Staff side		
Director	:	Chairman	Shri J.N.Mallah, SSG-II	:	Secretary
Dr. M.A. Khan, Pr. Scientist	:	Member	Shri U. Chaudhury, SSG-III	:	Member
Dr. M.K. Das, Pr. Scientist	:	Member			CJSC
Shri R.N. Mishra, Pr. Scientist	:	Member	Shri Moloy Kr. Das, Asst.	:	Member
Shri P.K. Katiha, Sr. Scientist	:	Member	Shri T. K. Majumder Asst.	:	Member
SAO	:	Member Sec.	Shri D. Chatterjee, T-3	:	Member
Shri V.S. Subramanium F& AO	:	Co-opt. Member	Shri Subhendu Mondal,T-2	:	Member
			Shri A.L Yadav, SS-IV	:	Member

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PARTICIPATION IN CONFERENCES, MEETINGS, WORKSHOPS, SYMPOSIA

CIFRI

PARTICIPATION IN CONFERENCES, MEETINGS, WORKSHOPS, SYMPOSIA

Participation in Symposia/Seminars/Workshops/ Conferences

Participant(s)	Name of Seminar/Symposia/Workshop etc. and Organiser	Venue and Date
Dr. D. Nath	National Seminar on Raw Jute (CRIJAF)	CRIJAF, Nilganj 17th April, 2004
Dr. D. Nath	Brainstorming meeting on Phase II of NATP	NASC Complex New Delhi 22-23 April, 2004
Dr. D. Nath	Meeting to justify the demand for additional budget for the Institute as approved earlier	KAB II, Pusa 26th April, 2004
Dr. D.S. Krishna Rao P.K. Sukumaran R.S. Panwar Dr. K.D. Joshi Dr. Usha Moza, Dr. D. Nath Dr. S.N. Singh Dr. R.N. Seth	Round Table on Impact of Inter River Basin Linkages on Fisheries. (National Academy of Agricultural Sciences)	New Delhi 21-22 May 2004
Dr. R.N. Seth	Meeting on Use of Data base on fish diversity and stress for immediate action due to fast changing ecological scenario Presided over by DDG (Fy), ICAR.	NBFGR 28th May 2004.
Dr. A.K. Laal	Attended Brain storming session conducted by CIFE & TIFAC	Mumbai. 8-10th June 2004
Dr. D. Nath	Mid-term Review of Regional Committee II meeting	CIFRI Centre Guwahati 8-10th June 2004
Dr. Preetha Panikkar	Training on Phytoplankton identification and taxonomy (Central Marine Fisheries Research Institute)	Kochi 14 to 19 June, 2004

Participant(s)	Name of Seminar/Symposia/Workshop etc. and Organiser	Venue and Date
Dr. D. Nath	'Wetland Day' organized by Directorate of Fisheries, Govt. of West Bengal	Nuna Bheri, Calcutta 16th June, 2004
Mr. S. K. Sahu	Summer school "GIS Based Decision Support System for sustainable Agriculture" (NAARM).	Hyderabad July 1 – 21, 2004
Dr. D. Nath	Directors Conference of ICAR Institutes	NASC Complex New Delhi 14-16 July 2004
Dr. R.K. Tyagi	Attended the 1 meeting of Technical Monitoring Committee for CAS "Strengthening of database and information networking for fisheries sector" (IASRI)	New Delhi 12-13th Aug 04.
M. Choudhury B. K. Bhattacharya R. K. Manna Ganesh Chandra Barik N. K.	Workshop on "strategy and approach for conservation and comprehensive development of fisheries involving community based programmes with special reference to North eastern region	NER centre Guwahati August 24-25 2004
M. Choudhury B. K. Bhattacharya R. K. Manna Ganesh Chandra N. K. Barik	Workshop for State govt. officers under CSS project on "Development of inland fisheries database"	NER centre Guwahati September 2-7 2004
Dr. Utpal Bhaumik Shri Sukumar Saha	Participated in the Exhibition cum Seminar at Institute of Engineering	Kolkata September 2-3, 2004
A. K.Das	Workshop on Optimal river flow requirement for preservation of ecology and environment in Krishna basin, Andhra Pradesh.	Hyderabad 4th September, 2004
Dr. B.P. Mohanty	Short term Course (Continuing Education Programme) on 'Bioinformatics in Genomics & Proteomics' (Department of Biotechnology, Indian Institute of Technology- Kharagpur (IIT-K)	Kharagpur (IIT-K) September 24-25, 2004.
Dr. D. Nath	Interface Workshop of DAC-DAH & D, DARE on Aquaculture	CIFA, Bhubaneswar 27-28 Sept. 2004
Dr.S.Bijoy Nandan	Seminar on Current Environmental Issues (Dept. of Zoology, T. K. M. M. College)	Alappuzha 28th Sept. 2004

Participant(s)	Name of Seminar/Symposia/Workshop etc. and Organiser	Venue and Date
Dr. Preetha Panikkar	Winter School on 'Towards ecosystem based management of marine fisheries- building mass balance trophic and simulation models' (Central Marine Fisheries Research Institute)	Kochi 30 September to 20 October 2004
B. K. Bhattacharjya R. K. Manna M. Choudhury Ganesh Chandra K. K. Sarma	Participated in: the colloquium on "South Asian Artisanal fishing, past tradition, contemporary reality" (Indian International Centre)	New Delhi October 8-9, 2004.
M. Feroz Khan	Seminar on Rain water harvesting (Karnataka State Science Centre at Indian Institute of Science)	Bangalore 22 October 2004
Sh. D.N. Mishra Dr. Usha Moza	Conference on National Environment Policy (NIE)	New Delhi 26th October, 2004
Dr. D.N. Singh	National Seminar on strategies for environment quality management in urban area (Deptt. of Zoology, Sri Agrasen Kanya Autonomous P.G. College, Bulanala, U.P)	Varanasi 28 October 2004
Dr. Utpal Bhaumik	Participated in the seminar on Bamboo in Fisheries (NIO)	Goa October 30 November 1, 2004.
Shri R.A. Gupta,	Attended a workshop on vigilance awareness	Badapani, Meghalaya 1 Nov. 2004.
Shri R.A. Gupta	Attended advance programme on Vigilance Mechanism for Vigilance and NON-vigilance Functionaries" (Institute of Socio-economic Research and Action).	New Delhi 18-20 Nov. 2004
Dr. R.N. Seth Dr. D.Kumar, Dr. Shree Prakash, Dr. K.D.Joshi Dr. B.L.Pandey	National Seminar on Zoology and Human Welfare (Dr. S. P. Mukherjee Govt. Degree College, Phaphmau, University of Allahabad)	Allahabad 22-24 November 2004

Participant(s)	Name of Seminar/Symposia/Workshop etc. and Organiser	Venue and Date
Dr.S.Bijoy Nandan	National Seminar in connection with the International Aqua show – Ornamental Fish Exhibition	Kochi 22 November 2004.
Dr. S.N. Singh	Was deputed to attend meeting of High Level Group (HLEG) on Fisheries, Narmada Control Authority,	New Delhi 23rd November, 2004
Mr. Debabrata Das,	Training programme on "Recent advances in Biometrics" held (IASRI)	New Delhi 24th November to 14 th December, 2004
B. K.Bhattacharjya M.Choudhury Md. Aftabuddin R. K. Manna Ganesh Chandra N. K. Barik	Delivered lecture in Training programme on 'Emerging trends in coldwater fisheries research and development' for fisheries officers of NE India (NRCCWF, Bhimtal in collaboration with NER Centre CIFRI)	Guwahati 6-10 December 2004
M. Choudhury B. K. Bhattacharya Md. Aftabuddin R. K. Manna Ganesh Chandra N. K. Barik	One day high level review meeting under CSS project on Development of inland fisheries database	NER centre Guwahati December 5 2004
Dr.S.Bijoy Nandan	Indian Environment Congress	Trivandrum. 16th December 2004
B. K. Bhattacharya R. K. Manna	Workshop cum awareness programme on 'Ornamental fish culture and trade in Assam' (Dept. of Fisheries, Assam)	Meen Bhaban, Ulubari, Guwahati, December 18, 2004
Dr. S.N. Singh	Participated in a scientific meeting convened by the Commissioner of Fisheries, Govt. of Maharashtra,	Mumbai 23rd December, 2004.
Dr. D. Nath	Sixth all India Conference & National Symposium on Sustainable production of safe food of animal and fish origin.(Association of Public Health Veterinarians, WBUAFS)	Nimpith Ashram, South 24 Pgs 27thDecember 2004
R.S. Panwar	Participated in XVIIth meeting of Regional Council Committee No. IV of ICAR (Indian Institute of Sugarcane Research)	Lucknow. 28thand 29 thDecember 2004

Participant(s)	Name of Seminar/Symposia/Workshop etc. and Organiser	Venue and Date
M. Choudhury Ganesh Chandra N. K. Barik K. K. Sarma A. Biswas	Workshop cum training programme for enumerators for Demand Supply analysis of fish in Assam	NER centre Guwahati January 3-5 2005
B. K.Bhattacharjya	Delivered lecture in Training programme on 'Breeding and rearing of ornamental fishes' (MPEDA, Kolkata and CIFRI, Barrackpore)	United Bank of India Training College Campus. Kolkata – 89 during 4-6 January, 2005
M. Karthikeyan Mr. D. Karunakaran	Winter School on "Remote Sensing and GIS applications in Fisheries Research Management" (Central Institute of Fisheries Education)	Mumbai 5 - 25 January 2005.
Dr. R.K. Tyagi	Attended the meeting of core group of Technical Monitoring Committee for centrally sponsored scheme "Strengthening of database and information networking for fisheries sector" (IASRI)	New Delhi 14th Jan 2005.
Dr. Amitabha Ghosh	Workshop on "Urban wastewater: Livelihood, Health and Environmental Impacts in India: the case of East Calcutta Wetlands "	Jadavpur University 28th Jan.2005
Dr.S.Bijoy Nandan	Regional seminar on Pampa Awareness Campaign on Pampa Action plan,	Kozhencherry 29 Jan. 2005.
Dr.S.Bijoy Nandan	Seventeenth Kerala Science Congress	Peechi, Trissur, Kerala 29-31January 2005.
Dr. K.K. Vass	Technical Monitoring Commmittee Meeting of Central Sector Scheme	Bangalore 31 st January, 2005
Dr. K.K. Vass	Technical meeting organized by NABARD and gave a presentation	Kolkata 4 th Febuary 2005
Dr. D.S. Krishna Rao Dr. P.K. Sukumaran	Seminar on Indo-Norwegian Biotech Opportunities at Hotel Taj West End	Bangalore 5 th February 2005.
M. Feroz Khan	Competence Based Education on "Environmental Management" (Indian Institute of Science)	Bangalore October 2004 to February 2005.
Dr. R.N. Seth	National Workshop on Ecological restoration (Department of Botany. T.N., Bhagalpur University)	Bhagalpur, Bihar 7-9 th February 2005.

Participant(s)	Name of Seminar/Symposia/Workshop etc. and Organiser	Venue and Date
Shri R.A. Gupta	Participated in a programme on performance assessment of agricultural research institutes (NAARM)	Hyderabad 15 th Feb to 19 th Feb 2005.
Dr. K.K.Vass	Attended and presented a paper at National Seminar on Recent Trend in Fisheries Development in India	Chandigarh 16 th February 2005.
Dr. K.K.Vass	Attended Exotic Committee Meeting convened by Jt. Secretary, Fisheries; Govt. of India	New Delhi 23 rd February 2005.
Dr. R.N. Seth Dr. H.P. Singh Dr. K.D. Joshi Dr. D.Kumar Dr. Shree Prakash Dr. K.D.Joshi	National symposium on Biodiversity, Conservation and sustainable utilization of Bio-resources (Deptt. of Botany, Ishwar Saran Degree College, University of Allahabad)	Allahabad March 2005.
Dr. K.K.Vass	Attended Inception Workshop on CP project of World Fish Centre	Bangalore March, 2005
Dr. K.K.Vass	Attended and presented paper at NIE/IWMI International Workshop on "Environmental Flows"	New Delhi 23-24 March 2005.
B. K.Bhattacharjya	Delivered lecture in: NIE/IWMI international workshop on "Environmental Flows"	New Delhi 23-24 March 2005.
Dr. Usha Moza	Workshop on "Environmental Flows" (NIE and IWMI)	NAAS, New Delhi 23-24 March, 2005

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EVENTS ORGANISED

CIFRI

14 EVENTS ORGANISED

Independence day was celebrated with solemnity at the headquarter. The Director unfurled the National flag.

Republic Day was celebrated with usual enthusiasm.

Vigilance Awarness Week: A Vigilance Awarness Week was observed in the institute from 1st Nov - 6th Nov 2004. During this week, the employees were administered with a PLEDGE and various activities including lectures/seminers on various aspects of vigilance in order to create awareness and enhance the vigilance profile of the Institute.

Sports Meet: ICAR Zonal Sports Meet Zone III was held at YBK, Kolkata during 14-18 January, 2005, CIFRI put up a sterling performance.

Hindi Week: The Institute observed the Hindi Week during 14-20 September, 2004 by organizing meetings and various competitions like essay writing, official letter writing and drafting in Hindi.The week long celebrations culminated in a meeting attended by all members of the staff. While addressing the gathering the Director appealed for progressive use of Hindi in the day-to-day activities of the institute.

- Training workshop for State govt. officers under CSS project on "Development of inland fisheries database was organized NER centre Guwahati on September 2-7 2004.
- A two-days workshop on "Pen culture in open waters of Northeastern India" was organised under NATP-JV project on November 2-3, 2004.

Fish Farmers Day

- Fish farmers' day was organized at Badarpur, Karimganj district, Assam on 10th July 2004 under NATP (Jai Vigyan) subproject 'Enhancing freshwater fish production from the beels through pen culture in tribal and rural areas of Assam'.
- Organised one Fish Farmers' day on Rice-cum-Fish culture in North 24-Parganas on May 17, 2004 at Hasnabad where 50 fish farmers actively participated.
- Institute organised National Fish Farmers' Day on July 10, 2004 at Narayanpur, Namkhana Sunderbans West Bengal. About 500 fish farmers, farm youths, farmwomen were present on the occasion and participated in the interaction session.

- Organised a Fish Farmers' Day on August 2, 2004 at Berhampur where 50 riverine fish seed collectors participated.

- Organised a Fish Farmers' Day at Joydev (District. Birbhum) in collaboration with Mayurakshi Gramin Bank on August 23, 2004 where 76 fishermen engaged in fishing in the Ajoy river participated.

- Organised a Fish Farmers' Day at Hanshkhali (Bongaon) North 24-Parganas on September 1, 2004 where 60 fishermen participated.

- Participated in Fish Farmers' Day at Seakhala where ill effect of pesticides in the waterbodies was explained to the farming community on December 15, 2004.

- 17th Fish Farmer's Day on 14th July organized by Haryana Fisheries at Panipat and was attended by Shri D.N. Mishra, Officer-in-charge, CIFRI, Karnal

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PERSONNEL

CIFRI

PERSONNEL

(Managerial position only, from March 2004 to April 2005)

CIFRI, Barrackpore, West Bengal

Dr. K. K.Vass, Director w.e.f January 29, 2005.

Dr. D. Nath Actg. Director till January 28, 2005.

Riverine Division, Allahabad, Uttar Pradesh

Dr. R.S. Panwar, Principal Scientist, Head of Division (Acting)

Reservoir Division, Bangalore, Karnataka

Dr. D.S.K.Krishna Rao , Principal Scientist, Head of Division (Acting)

Estuarine Division, Barrackpore, West Bengal

Mr.R.N.Mishra , Principal Scientist, Head of Division (Acting)

Fish Health & Environment Division, Barrackpore, West Bengal

Dr. Manas Kr. Das, Principal Scientist, Head of Division (Acting)

Floodplain Wetlands Division, Guwahati, Assam

Dr.A.Mukherjee, Principal Scientist, Head of Division (Acting)

Resource Assessment Division, Barrackpore, West Bengal

Shri R.A. Gupta, Principal Scientist, Head of Division (Acting)

Human Resource Development& transfer of technology Division

Dr. Utpal Bhaumik, Principal Scientist, Head of Division (Acting)

Senior Administrative Officer, CIFRI, Barrackpore

Shri U.C.Prasad w.e.f June 1st, 2004.

Finance & Accounts Officer, CIFRI, Barrackpore

Shri V.S. Subramanium

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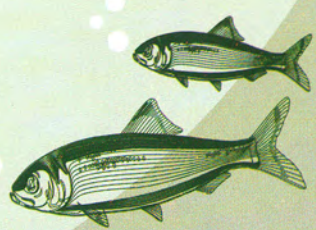
DISTINGUISHED VISITORS

CIFRI



DISTINGUISHED VISITORS

Following distinguished persons visited the Institute Headquarters at Barrackpore and other regional centres of CIFRI during the period

Sri S.A.H Abidi, Member, A.S.R.B., New Delhi

Shri R.N. Srivastava, LA.S., Director, U.P. Fisheries

Dr. S. C. Pathak, Ex. General Manager, National Bank for Agriculture and Rural Development.

Shri B.N. Singh, Ex.Asst.Director General (Fisheries), ICAR.

Prof. Anita Gopesh, Zool.Dept., Allahabad University

Prof. S.L. Srivastava, Asst. Executive Officer, National Academy of Sciences, Allahabad.

Dr. Arvind Mishra, Chief Executive Officer, State Fisheries, Pratapgarh, U.P.

Shri B.P. Bhartiya, Astt. Director of Fisheries, Allahabad.

Dr.Anoop Chaturvedi, Professor, Statistics, Allahabad University, Allahabad.

Dr. Sushil Chaturvedi, Prof. Botany, Univ. of Nagaland, Nagaland..

Dr. S.B. Srivastava, Executive Manager, U.P. Matsya Vikas Niga Lucknow.

Dr.P.S. Sindhu, World Bank.

Dr. S.L. Mehata, Former National Director, NATP, ICAR, New Delhi.

Dr.P.V. Dehadri, Ex. DDG (Fy), ICAR.

Dr. PSBR James, Former Director, CMFRI, Cochin.

Dr. Mangala Rai, Secretary DARE & D.G., ICAR.

Dr. S. Ayyappan, DDG (Fy), ICAR, New Delhi.

Dr. V.R. Chitranshi, ADG (Fy), ICAR, New Delhi.

Dr. S.D. Tripathi, Ex-Director, CIFE, Mumbai.

Prof. Brij Gopal, Jawahar Lal Nehru University, New Delhi.

Dr. Marck Prein, Project Leader, World fish Centre, Penang, Malaysia.

Dr. Madan Dey, World Fish Centre (South East Country).

Dr. Aurther Rebort (MRAG, UK).

Dr. Chris Benn, World Fish Centre.

Dr.K.V.Devaraj, Ex.V.C.,University of Agricultural Science and Technology, Bangalore Dr. H.P.C. Shetty, Director, Mangalore Fisheries College.

Dr. A.K. Bandhyapadhya, V.C; West Bengal University of Animal and Fishery Sciences. Dr. Sarojini Pillai, Former Scientist, CIFRL

Dr. S.D Sharma, Director, IASRI, ICAR, New Delhi.

Shii A.K. Bhattacharya, Joint Secretary, DAHD, Ministry of Agriculture, Govt. of India

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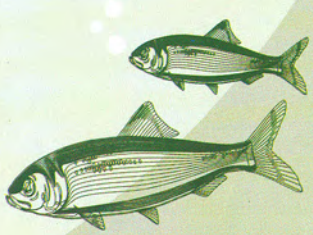
INFRASTRUCTURAL DEVELOPMENT

CIFRI



INFRASTRUCTURAL DEVELOPMENT

- In order to provide adequate facilities for our North Eastern activities, additional infrastructure was created for our North East Regional Centre at Guwahati during the year.

- To create permanent infrastructure facilities for our Reservoir Research Division at Bangalore, first installment of funds was released to CPWD for construction. The basic land facilities are jointly shared with CIFA as per council's approval.

वार्षिक प्रतिवेदन

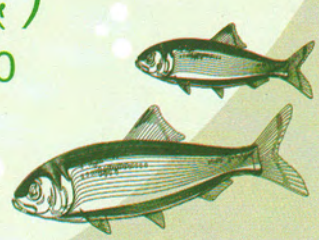
CIFRI

2004 - 2005

केन्द्रीय अंतर्स्थलीय मात्स्यकी अनुसंधान संस्थान

(भारतीय कृषि अनुसंधान परिषद्)

बैरकपुर, कोलकाता - 700120



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आमुख

CIFRI

1 आमुख

केन्द्रीय अंतर्स्थलीय मात्स्यकी अनुसंधान संस्थान ने विगत वर्षों की तरह इस वर्ष भी अपने अनुसंधान कार्यक्रमों को अंतर्स्थलीय जलीय संसाधनों जैसेः- नदी, जलाशय, ज्वारनदमुख, आर्द्र क्षेत्र आदि की उत्पादन क्षमताओं के आंकलन आदि के अनुरूप बनाया है। इसके अलावा मत्स्य स्वास्थ्य एवं परितंत्रों के अनुमापन एवं प्रबन्धन तथा भौगोलिक सूचना प्रणाली के अंतर्गत जलीय संसाधनों के मूल्यांकन हेतु भी अनुसंधान कार्य किया गया है। आवश्यक डाटा के संकलन एवं योजनाओं के विकास हेतु मात्स्यकी के विभिन्न पहलुओं पर 13 परियोजनाओं पर कार्य किया गया है। इन अनुसंधान कार्यों के अलावा संस्थान ने नदीय एवं ज्वारनदमुखी मात्स्यकी पर आधारित मछुआरों में जैव-विविधता एवं परितंत्रों के संरक्षण के प्रति जागरुकता लाने की दिशा में पहल की है तथा साथ ही आर्द्र क्षेत्र की मात्स्यकी विकास की तकनीकों को निदर्शित करने का प्रयास भी किया गया है।

इस संस्थान के संबंध पश्चिम बंगाल, गुजरात, कर्नाटक, असम, हरियाणा, उत्तर प्रदेश सरकारों के साथ और भी सुदृढ़ हुए हैं। यह संस्थान भारत सरकार द्वारा प्रायोजित एक परियोजना के तहत भौगोलिक सूचना प्रणाली के उपयोग से 35 राज्यों एवं संघ शासित प्रदेशों की मात्स्यकी संसाधनों के मूल्यांकन हेतु कार्य कर रहा है। यह कार्य देश के अंतर्स्थलीय मात्स्यकी संसाधनों के मूल्यांकन की दिशा में एक सघन प्रयास है। इन कार्यों के अतिरिक्त संस्थान अन्य सह-संस्थानों, राज्य कृषि विश्वविद्यालयों के साथ मिलकर अनेक नेटवर्क परियोजनाओं पर भी कार्य कर रहा है। इस संस्थान ने अंतर्राष्ट्रीय स्तर पर वर्ल्ड फिश सेन्टर, पेनांग, मलेशिया के सहयोग से दो अनुसंधान कार्यक्रमों को सफलतापूर्वक सम्पन्न किया। सुनामी त्रासदी को ध्यान में रखकर संस्थान ने मैंग्रोव से संबंधित महत्वपूर्ण सूचनाएँ प्राधिकारियों को दी हैं ताकि प्रभावित तटीय क्षेत्रों में मैंग्रोव से संबंधित पुनरूद्धार योजनाओं में इनका समावेश हो सके।

संस्थान संसाधनों को जुटाने एवं परिषद् द्वारा निर्धारित लक्ष्य की प्राप्ति में वैज्ञानिकों एवं तकनीकी कर्मचारियों के कुशल योगदान से सफल रहा है। उत्तर-पूर्वी पर्वतीय क्षेत्र के संदर्भ में, संस्थान ने अनुमोदित कार्यक्रम को कार्यान्वित किया जिसके अंतर्गत बाढ़कृत आर्द्र क्षेत्रों की मात्स्यकी की वृद्धि पर विशेष कार्य किया गया। जन जागृति के प्रयासों के अंतर्गत विभिन्न प्रकाशनों को प्रकाशित किया गया एवं 16 प्रदर्शनियों एवं मत्स्य पालक दिवसों का आयोजन किया गया।

अनुसंधान सलाहकार समिति, स्टाफ रिसर्च काउंसिल, प्रबन्धन समिति, संस्थान का संयुक्त कर्मचारी परिषद आदि समितियों की बैठकें निर्धारित समय पर आयोजित की गयी एवं इनकी सिफारिशों तथा सुझावों को अनुसंधान एवं संस्थान के प्रबन्धन में लागू किया गया ।

संस्थान के वैज्ञानिक, तकनीकी एवं प्रशासनिक अधिकारियों तथा कर्मचारियों को मानव संसाधन विकास कार्यक्रमों के तहत अपनी कार्य कुशलता को बढ़ाने हेतु पर्याप्त अवसर दिए गए हैं ।

मैं, डॉ. मंगला राय, सचिव, कृषि अनुसंधान एवं शिक्षा विभाग तथा महानिदेशक, भारतीय कृषि अनुसंधान परिषद् को धन्यवाद देता हूँ जिन्होंने इस संस्थान के कार्यकलापों के लिए निरन्तर प्रोत्साहित किया है एवं सहायता दिया हैं । मैं, डॉ. एस. अयप्पन, उप-महानिदेशक (मत्स्य) के प्रति भी आभारी हूँ जिन्होंने इस संस्थान के अनुसंधान कार्यों के लिए महत्वपूर्ण मार्गदर्शन एवं सहायता प्रदान की है । इनके आलावा मैं परिषद के मात्स्यकी प्रभाग विशेषकर डॉ. वी.आर. चित्रांशी, सहायक महानिदेशक (अंतर्स्थलीय मात्स्यकी), डॉ. ए. डी. दिवान, सहायक महानिदेशक (समुद्री मात्स्यकी), श्री अनिल अग्रवाल, प्रधान वैज्ञानिक एवं श्री ए. एस. भाटिया, अवर सचिव को भी धन्यवाद देता हूँ जिनका सहयोग समय समय पर प्राप्त होता रहा है ।

इस रिपोर्ट में दर्शायी गयी सभी उपलब्धियाँ संस्थान के सभी अधिकारियों एवं कर्मचारियों का सामूहिक प्रयास है, जिसके लिए वे सभी धन्यवाद के पात्र हैं, परन्तु अभी भी उनमें अपने कार्य निष्पादन में निखार लाने की अपार संभावनाएँ हैं । मैं आशा करता हूँ कि वे भविष्य में और अधिक उत्साह एवं निष्ठा के साथ अपना कार्य निष्पादित करेंगे ।

मुझे आशा है कि यह संक्षिप्त रिपोर्ट विभिन्न वर्गों के लोगों एवं संगठनों के लिए उपयोगी सिद्ध होगी जिन्हें विवृत्त जलीय क्षेत्रों की मात्स्यकी एवं दीर्घकाल तक मत्स्य उपज प्राप्त करने तथा जैव-विविधता के संरक्षण में रुचि है । मैं व्यक्तिगत रुप से भी उनके विचार जानने का इच्छुक हूँ ताकि इस रिपोर्ट को भविष्य में और अधिक सूचनाप्रद बनाया जा सके ।

मैं, डॉ. मानस कुमार दास, प्रधान वैज्ञानिक को धन्यवाद देता हूँ जिन्होंने इस रिपोर्ट के मसौदा को तैयार किया तथा उन सभी सहकर्मियों को भी धन्यवाद देता हूँ जिन्होंने इस रिपोर्ट के प्रकाशन में सहायता की हैं । श्री पी.आर. राव द्वारा हिन्दी खण्ड के लिए किए गए कार्य के प्रति भी आभारी हूँ ।

कुलदीप वास

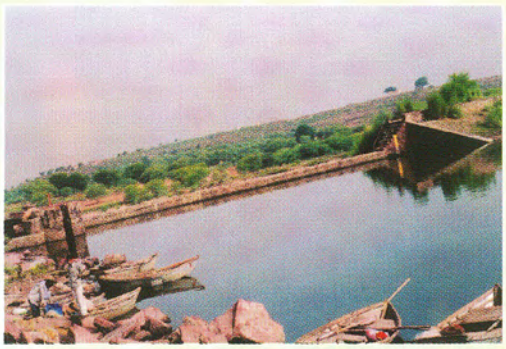
कुलदीप कुमार वास
निदेशक

2

विशिष्ट सारांश

CIFRI

2 विशिष्ट सारांश



केन्द्रीय अंतर्स्थलीय मात्स्यकी अनुसंधान संस्थान की स्थापना मार्च 1947 में एक अनुसंधान केन्द्र के रुप में हुई जो कालान्तर में एक संपूर्ण संस्थान में विकसित हुई । इन वर्षों में यह संस्थान अंतर्स्थलीय मात्स्यकी के क्षेत्र में एक प्रमुख संस्थान के रुप में स्थापित हुआ है । यह संस्थान पश्चिम बंगाल राज्य के कोलकाता शहर के निकट बैरकपुर में स्थित है । इस संस्थान में इस समय 65 वैज्ञानिक, 87 तकनीकी कर्मचारी, 75 प्रशासनिक कर्मचारी एवं 174 सहायक वर्ग के कर्मचारी कार्यरत हैं । वित्तीय वर्ष 2004-05 के दौरान इस संस्थान का कुल बजट 12.54 करोड़ रुपये था ।

संस्थान ने अपने अनुसंधान कार्य को उच्चस्तरीय अनुसंधान सलाहकार समिति जिसमें मात्स्यकी एवं जलीय पारिस्थितिकी क्षेत्र के विशिष्ट व्यक्ति सदस्य हैं, के मार्गदर्शन के अनुसार व्यवस्थित किया । अनुसंधान कार्यक्रमों की रुप रेखा को इस प्रकार तैयार किया गया ताकि vision 2020 तथा पंचवर्षीय समीक्षा दल की संस्तुतियों का समावेश हो सके । इनके अलावा परिषद् एवं SMD से प्राप्त निर्देशों को भी अनुसंधान कार्यक्रमों में समावेश किया गया। संस्थान के कार्य कलापों को दिशा-निर्देश देने हेतु एक प्रबन्धन समिति भी है । इसके अलावा अनेक आंतरिक समितियाँ जैसेः- स्टाफ रिसर्च काउंसिल, इंस्टिट्यूट जाइन्ट स्टाफ काउंसिल, राजभाषा कार्यान्वयन समिति, परामर्शक सेवा कक्ष आदि का गठन किया गया है जो अपनी नियमित बैठकों में लिए गए निर्णयों से संस्थान के प्रबन्धन में महत्वपूर्ण योगदान देती हैं ।

रिपोर्ट की अवधि के दौरान संस्थान में अनुसंधान कार्य, प्रौद्योगिकी हस्तांतरण, मानव संसाधन विकास, जन जागरण कार्यक्रम, देशी-विदेशी संगठनों के साथ अनुसंधान सहयोग की स्थापना आदि पर विशेष ध्यान दिया गया ।

अनुसंधान कार्यक्रमों की दिशा मुख्यतः परितंत्रों के अनुसंधान जैसेः- स्त्रोतों का मूल्यांकन, पारिस्थितिकी, जैव-विविधता, मत्स्य सम्पदा मूल्यांकन, उपज तथा पर्यावरणीय अनुमापन एवं प्रबन्धन की ओर था । इस अवधि के दौरान संस्थान ने बाहरी संगठनों द्वारा प्रायोजित 5 परियोजनाओं तथा विदेशी संस्थाओं द्वारा प्रायोजित 2 परियोजनाओं के अलावा संस्थान के 13 अनुसंधान परियोजनाओं पर भी कार्य सम्पन्न किया । इन अनुसंधान परियोजनाओं की महत्वपूर्ण उपलब्धियाँ निम्नलिखित हैं-

व्यास नदी में सी. कार्पियो मछलियों की बहुलता ।

नदीय मात्स्यकी

व्यास नदी में विदेशी कार्प मछलियों *सी. कार्पियो* एवं *सी. गरीपिनियस* का पाया जाना, देशी मत्स्य प्रजातियों पर इनके प्रभाव की दृष्टि से महत्वपूर्ण है ।

जलाशय मात्स्यकी

काबिनी जलाशय में *कतला कतला* एवं *लेबियो रोहिता* मत्स्य बीजों का पिंजरों में सफलतापूर्वक संवर्धन किया गया तथा 5-6 ग्रा. शारीरिक वजन वाली अंगुलिकाओं को जलाशय में छोड़ा गया ।

रामसागर जलाशय, राजस्थान ।

राजस्थान एवं उत्तर प्रदेश के जलाशयों का सर्वेक्षण किया गया ।

ज्वारनदमुखी मात्स्यकी

हुगली ज्वारनदमुख के मीठेजल वाली प्रजातियों की उपज में 11.5% की वृद्धि देखी गई जो लवणीय स्तर में आई कमी का परिणाम है । परन्तु हुगली ज्वारनदमुख में हिल्सा मत्स्य बीजों के ह्रास में 118.0% की वृद्धि देखी गई जो इस मत्स्य सम्पदा के लिए विनाशकारी है ।

बाढकृत मैदानी क्षेत्र की मात्स्यकी

बील में पिंजरे में मछली पालन

बीलों में बनाए गए पिंजरों में *एल. रोहिता, सी. म्रिगाला* एवं *एल. कलबसु* के मत्स्य बीजों को 50-100 प्रति वर्गमीटर की दर से संग्रहित किया गया । इसमें 120 दिनों के पश्चात इनका शारीरिक भार बढ़कर क्रमशः 39.49,21.6 तथा 11.0 ग्रा. हो गया परन्तु इससे स्पष्ट होता है कि पिंजरों में भी उच्च घनत्व में मत्स्य बीज संग्रहित करने पर मत्स्य विकास पर प्रतिकूल प्रभाव पड़ता है ।

मत्स्य स्वास्थ्य एवं पर्यावरण

डी.एन.ए.डॉट ब्लॉट हाइब्रिडाइजेशन तकनीक द्वारा ए. हाइड्रोफिला एवं विशाक्त एरोमोनास प्रजातियों की विशिष्ट जाँच के लिए डी.एन.ए. परीक्षण को विकसित किया गया ।

संसाधन मूल्यांकन

राजस्थान के सभी जिलों का डिजिटल आधारित मानचित्र तैयार किया गया है ।

बिहार के 10 हे. से बड़े जलनिकायों तथा नदियों एवं झरनों का मैपिंग व इनसे संबंधित आंकड़ों से जी. आई.एस प्लैटफॉर्म पर एक विस्तृत तालिका तैयार की गई ।

भारत के विभिन्न मत्स्य स्थलन केन्द्रों से संबंधित मत्स्य उपज के आंकड़े भौगोलिक सूचना प्रणाली पर संकलित किया गया ताकि इन आंकड़ों को आसानी से देखा जा सके ।

अन्य कार्यकलाप

संस्थान की विभिन्न समितियों जैसे - स्टाफ रिसर्च काउंसिल, अनुसंधान सलाहकार समिति, प्रबन्धन समिति, राजभाषा कार्यान्वयन समिति, आई.जे.एस.सी. आदि की बैठकें भी नियमित रुप से सम्पन्न हुई हैं । इन समितियों ने अपनी बैठकों में विभिन्न मुद्दों पर विचार विमर्श कर संस्थान के प्रबन्धन एवं अनुसंधान कार्य को सुचारु रुप से चलाने के लिए आवश्यक दिशा-निर्देश दिया हैं ।

यह संस्थान देश की संस्कृतियों की विविधता का प्रतीक है, जिसके हर सदस्य ने विभिन्न राष्ट्रीय कार्यक्रमों एवं दिवस में अच्छे ताल-मेल एवं भाई-चारे से भाग लिया है ।

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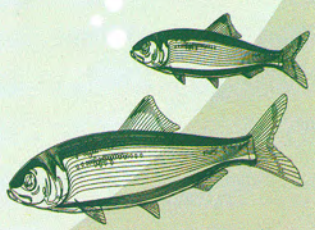
भूमिका



3 भूमिका

संक्षिप्त इतिहास

केन्द्रीय सरकार के कृषि, वानिकी तथा मात्स्यकी से संबंधित उप-समिति के प्रस्ताव पर 17 मार्च 1947 को भारत सरकार के खाद्य व कृषि मंत्रालय के अंतर्गत केन्द्रीय अंतर्स्थलीय मात्स्यकी अनुसंधान केन्द्र की स्थापना कलकत्ता में हुई । एक छोटे पैमाने पर प्रारंभ किया गया यह केन्द्र अपने कार्यकलापों के बल पर वर्ष 1959 में एक संस्थान के रूप में परिणत हुआ तथा बैरकपुर, पश्चिम बंगाल के नवनिर्मित भवन में इसका स्थानांतरण हुआ । कालान्तर में यह संगठन समूचे राष्ट्र के अंतर्स्थलीय मात्स्यकी एवं जलकृषि पारिस्थितिकी का सर्वश्रेष्ठ अनुसंधान संस्थान के रूप में प्रतिष्ठित हुआ । वर्ष 1967 से यह संस्थान भारतीय कृषि अनुसंधान परिषद्, कृषि अनुसंधान एवं शिक्षा विभाग, भारत सरकार का विधिवत् सदस्य है ।

प्रारंभ में संस्थान का मुख्य उद्देश्य देश के अंतर्स्थलीय मात्स्यकी संसाधनों का उचित मूल्यांकन एवं इनके संरक्षण तथा अधिकतम समुपयोजन के लिये उपयुक्त प्रणालियों का विकास था । इन उद्देश्यों की पूर्ति के लिये संस्थान ने देश में उपलब्ध सभी अंतर्स्थलीय जल संसाधनों के पारिस्थितिकी एवं उनके उत्पादन क्षमताओं का अध्ययन किया । साथ ही तालाबों की पारिस्थितिकी एवं उत्पादन से संबंधित कृषि पद्धतियों का भी अध्ययन किया गया जिससे प्रति इकाई मत्स्य उत्पादन में वृद्धि की जा सके ।

1960 और 1970 के दशक में संस्थान ने भारत सरकार के योजनास्वरूप जलकृषि अनुसंधान एवं विकास पर अपना ध्यान केन्द्रित करना आरंभ किया । देश के मात्स्यकी अनुसंधान एवं कृषि पद्धति में महत्वपूर्ण उपलब्धियों को प्राप्त करने के बाद संस्थान ने चार अखिल भारतीय समन्वित अनुसंधान परियोजनाओं का कार्य प्रारंभ किया । ये परियोजनाएँ थीं - मिश्रित मत्स्य पालन व नदीय मत्स्य बीज उत्पादन, वायु-श्वासी मत्स्य पालन, अलवणीय जलाशयों की पारिस्थितिकी तथा लवणीय जल मत्स्य पालन । मिश्रित मत्स्य पालन व नदीय मत्स्य बीज उत्पादन नामक संयुक्त परियोजना जो 1974 में प्रारंभ हुई थी, की सफलता भारत के मत्स्य पालन के लिये एक ऐतिहासिक घटना थी जिसे देश के मीठाजल जीव पालन के विकास के आधार - स्तंभ के रूप में स्थापित किया जाता है । परिणामस्वरूप, 1977 मे धौली, उड़ीसा में मीठाजल जीव पालन अनुसंधान एवं प्रशिक्षण केन्द्र की शुरूआत हुई जो 1987 में केन्द्रीय मीठाजल जीव पालन अनुसंधान संस्थान के नाम से प्रसिद्ध हुआ । इसी प्रकार इसी संस्थान ने केन्द्रीय खाराजल जीव पालन अनुसंधान संस्थान तथा राष्ट्रीय शीतजल मात्स्यकी अनुसंधान केन्द्र को प्रारंभ किया जिनका कार्य खाराजल जीव पालन एवं शीतजल मात्स्यकी से संबंधित अनुसंधान कार्य था । अतः के.अं.मा.अनु.सं को तीन प्रमुख अनुसंधान संस्थानों को प्रारंभ करने का श्रेय प्राप्त है ।

विशेष सेक्टर संस्थानों के निर्माण, देश के बाहर व भीतर विवृत जल मात्स्यकी से संबंधित मुद्दों का जन्म एवं इसकी बढ़ती लोकप्रियता तथा जलकृषि संसाधनो के प्रबंधन को ध्यान में रखते हुए संस्थान के अधिदेश में संशोधन किया गया ।

2. संस्थान के अधिदेश

बदलते परिदृश्यों तथा वर्तमान अनुसंधान और विकास की आवश्यकताओं को ध्यान में रखते हुए प्रबंधन हेतु अनुसंधानात्मक प्राथमिकताओं का पुनःसंस्करण आवश्यक है जिससे दीर्घकाल तक मत्स्य उत्पादन हो सके । साथ ही जैव-विविधता, जो किसी भी उत्पादन व्यवस्था का आधार-स्तंभ है का भी संरक्षण आवश्यक है । अतः संस्थान के अनुसंधान कार्य की प्राथमिकताओं में परिवर्तन किया गया है । परिवर्तित प्राथमिकताएँ निम्नलिखित हैं -

1. अंतर्स्थलीय विवृत जल क्षेत्र जैसे नदी, ज्वारनदमुख जिसमें लैगून, जलाशय एवं आर्द्रक्षेत्र भी सम्मिलित हैं, के मत्स्य व मात्स्यकी पर वैज्ञानिक डेटाबेस तैयार करना ।

2. जलाशय एवं आर्द्रक्षेत्र में दीर्घकालिक मात्स्यकी के लिये पारिस्थितिकी पर आधारित प्रबंधन प्रणाली का विकास ।

3. मात्स्यकी पर बदलते पारिस्थितिकी के दुष्प्रभाव का मूल्यांकन तथा उसे कम करने के लिये योजनाएँ बनाना ।

4. अंतर्स्थलीय जलीय परितंत्रों का संरक्षण एवं इनकी मात्स्यकी के लिये उपयुक्त योजनाएँ उपलब्ध कराना ।

संगठन

भारतीय कृषि अनुसंधान परिषद् द्वारा विजन-2020 अनुमोदित होने तक संस्थान ने अपने अनुसंधान कार्य को सात प्रभागों के अंतर्गत रखा है, जिन्हें अनुसंधान सहायक सेवाओं/अनुभागों द्वारा सहायता दी जाती है । उत्तर प्रदेश के इलाहाबाद स्थित **नदीय प्रभाग** देश के नदीय संसाधनों एवं मात्स्यकी के अनुमापन एवं प्रभावशाली प्रबन्धन प्रणालियों को विकसित करने में जुटा हुआ है । इस कार्य के दौरान नदीय पर्यावरण एवं मत्स्य सम्पदा के संरक्षण पर विशेष ध्यान दिया जाता है । संस्थान का **जलाशय प्रभाग** कर्नाटक के बंगलोर में स्थित है एवं यह प्रभाग बड़े, मध्यम तथा छोटे जलाशयों की मत्स्य उपज बढ़ाने के लिए प्रबन्धन प्रणालियों विकसित करने हेतु कार्य कर रहा है । बैरकपुर (कोलकाता) मुख्यालय स्थित **ज्वारनदमुखी प्रभाग**, ज्वारनदमुखी मात्स्यकी एवं पारिस्थितिकी, तटीय आर्द्र क्षेत्र तथा सुन्दरवन मैंग्रोव पारिस्थितिकी पर कार्य कर रहा है । **मत्स्य स्वास्थ्य एवं पर्यावरणीय अनुमापन प्रभाग** विवृत्त जल क्षेत्र जैसेः- नदी, आर्द्र क्षेत्र, जलाशय और ज्वारनदमुखों की पर्यावरण एवं मत्स्य स्वास्थ्य संबंधी विभिन्न पहलुओं पर कार्य कर रहा है । यह प्रभाग पर्यावरणीय अनुमापन एवं प्रबन्धन हेतु जैव-रसायनिक, सूक्ष्मजैविकी तथा जैव-प्रौद्योगिकी जैसे

पहलुओं पर भी कार्य कर रहा है । परितंत्रों के पुनरूद्धार हेतु योजनाएँ बनाना भी इस प्रभाग के दायित्वों में से एक है । बाढ़कृत मैदानी आर्द्र क्षेत्र प्रभाग, आर्द्र क्षेत्र परितंत्रों की उत्पादन प्रक्रिया एवं मत्स्य उत्पादन की वृद्धि हेतु जैव-विविधता संरक्षण तथा पारिस्थितिक अनुकूल पद्धतियों को विकसित करने की दिशा में अनुसंधान कार्य करता है । बैरकपुर (कोलकाता) स्थित संसाधन मूल्यांकन प्रभाग देश की मत्स्य सम्पदा एवं जलीय संसाधनों से संबंधित डाटाबेस तैयार करने में जुटा हुआ है । यह प्रभाग लम्बी अवधि तक मत्स्य उपज प्राप्त करने हेतु संसाधनों के प्रबन्धन संबंधी डाटाबेस भौगोलिक सूचना प्रणाली पर तैयार करने का प्रयास कर रहा है ।

संस्थान का मानव संसाधन विकास एवं प्रौद्योगिकी हस्तांतरण प्रभाग बैरकपुर मुख्यालय में स्थित है जिसका लक्ष्य संस्थान के मानव संसाधनों को प्रशिक्षित करना तथा मात्स्यकी से जुड़े लोगों को शिक्षित करना है । प्रौद्योगिकी हस्तांतरण प्रखण्ड मत्स्य पालकों, मछुआरों, उद्यमियों, विस्तार कार्यकर्त्ताओं को प्रशिक्षण, प्रदर्शनियाँ, सलाहकार सेवाओं, मत्स्य पालक दिवस, चर्चा, फिल्म शो आदि के माध्यम से अंतर्स्थलीय मात्स्यकी से संबंधित विभिन्न तकनीकों को हस्तांतरित करता है ।

संस्थान के अनुसंधान प्रबंधन में निदेशक का पद सर्वोच्च होता है तथा समस्त प्रबंधन कार्य निदेशक की अध्यक्षता में ही सम्पन्न किया जाता है । स्टाफ रिसर्च काउंसिल तथा अनुसंधान सलाहकार समिति संस्थान के अनुसंधान व विस्तार कार्यकलापों से संबंधित सुझाव प्रदान करते हैं । संस्थान के अनुसंधान कार्य विभिन्न परियोजनाओं के द्वारा सम्पन्न किये जाते हैं जिनका निष्पादन बैरकपुर मुख्यालय तथा संस्थान के आंचलिक केन्द्रों जैसे इलाहाबाद, बैंगलोर, वदोदरा एवं गुवाहाटी से किया जाता है । संस्थान के संरचनात्मक ढाँचे को निम्नलिखित रूप में दिखाया गया है ।


भारतीय कृषि अनुसंधान परिषद्
निदेशक
अनुसंधान सलाहकार समिति
प्रबंधन समिति
अनुसंधान प्रभाग
नदीय प्रभाग
ज्वारनदमुखी प्रभाग
जलाशय प्रभाग
बाढ़कृत मैदानी आर्द्र-क्षेत्र / सरोवरीय प्रभाग
मत्स्य स्वास्थ्य एवम् पर्यावरणीय अनुमापन प्रभाग
संसाधन मूल्यांकन प्रभाग
मानव संसाधन विकास एवं प्रौद्योगिकी हस्तांतरण प्रभाग
प्रशासन
सामान्य प्रशासन
भंडार व परिवहन
वर्क्स व युटिलिटी
हिन्दी कक्ष
वित्त
लेखा व लेखा परीक्षण
पेंशन कक्ष
अनुसंधान सहयोग
पुस्तकालय
एरिस सेल
प्रलेखन

अनुसंधान सहायक सेवाएँ

पुस्तकालय

संस्थान का पुस्तकालय मुख्यालय एवम् अनुसंधान केन्द्रों में कार्यरत वैज्ञानिकों की आवश्यकताओं के अलावा अन्य संगठनों के शोधकर्ताओं, अध्यापकों, विद्यार्थियों तथा अधिकारियों को भी अपनी सेवाएँ प्रदान कराता है । इस रिपोर्ट की अवधि के दौरान पुस्तकालय ने अपने भंडार में 152 पुस्तकें, 55 विविध प्रकाशनों तथा जरनलों के 625 अंक संग्रहित किये तथा 22 विदेशी एवम् 62 भारतीय जरनलों के लिए शुल्क जमा दिया । इस समय पुस्तकालय में कुल 10001 पुस्तकें, 4292 पुनर्मुद्रित लेख, 1252 मानचित्र, 4222 विविध प्रकाशन तथा 53 शोध प्रबन्धों का भंडार है ।

संसाधन विनिमय योजना के तहत यह पुस्तकालय अनेक देशी-विदेशी संगठनों के साथ पुस्तकों का विनिमय भी किया है । वर्ष 2004-05 के दौरान पुस्तकालय का 22 लाख रु. का बजट उचित रुप से खर्च किया गया है । इस दौरान पुस्तकें, जरनल, सी.डी.रोम तथा अन्य पठन सामग्री की खरीद की गई है । पुस्तकालय द्वारा इंडियन फिशरीज एब्सट्राक्ट का प्रकाशन भी जारी रखा है । जनवरी से दिसम्बर 2004 तक के करेंट कन्टेन्टस् को भी प्रकाशित किया गया है ।

परियोजना अनुमापन एवं कार्यान्वयन

यह अनुभाग संस्थान के विभिन्न अनुसंधान परियोजनाओं की प्रगति का अनुमापन एवं स्टाफ रिसर्च काउंसिल की बैठकों का आयोजन करता है । सभी अनुसंधान परियोजनाओं की वार्षिक प्रगति तथा प्रत्येक वैज्ञानिक के योगदान संबंधी सूचनाओं को भी इस अनुभाग द्वारा संकलित किया जाता है । अनुसंधान प्रगति का अनुमापन आर. पी. एफ. I, II और III के माध्यम से किया जाता है। एक्टविटी माइलस्टोन, तिमाही और वार्षिक रिपोर्ट आदि इस अनुभाग के मुख्य दायित्वों में से हैं । समय-समय पर विभिन्न अनुसंधान परियोजनाओं की प्रगति को संकलित कर परिषद् के मुख्यालय, कृषि मंत्रालय तथा अन्य संगठनों को भेजा जाता है । संस्थान के अनुसंधान कार्यकलापों के संबंध में देश-विदेश से आए प्रश्नों का उत्तर देना भी इस अनुभाग का दायित्व है ।

एरिस सेल

इस कक्ष द्वारा वैज्ञानिकों एवं अन्य अधिकारियों तथा कर्मचारियों को कम्प्यूटर की सुविधाए उपलब्ध करायी जाती हैं । संस्थान में पूरी तरह लोकल एरिया नेटवर्क स्थापित किया हुआ है । मुख्य भवन में वैज्ञानिकों को इन्टरनेट की सुविधा भी उपलब्ध करायी गयी है ।

वर्तमान में चल रही परियोजनाएँ

परियोजना का शीर्ष	परियोजना प्रमुख का नाम	प्रारंभिक वर्ष	कार्य समाप्ति का संभावित
इंडस नदीय परितंत्र की पारिस्थितिकी, जैव-विविधता तथा उत्पादन क्षमता का मूल्यांकन	श्री डी.एन.मिश्रा	अप्रैल, 2002	मार्च, 2005
मात्स्यकी के परिप्रेक्ष्य में गंगा नदी में मत्स्य आवास के ह्रास का मूल्यांकन	डॉ. आर. एस. पंवार	अप्रैल, 2001	मार्च, 2006
उत्पादन क्षमता के संदर्भ में पूर्वी भारत के ज्वारनदमुखी परितंत्रों एवं लवणीय आर्द्र क्षेत्रों का अध्ययन ।	डॉ. दिवाकर नाथ	अप्रैल, 2003	मार्च, 2008
पर्यावरणीय परिप्रेक्ष्य में कुछ विशेष ज्वारनदमुखी परितंत्रों की जैविक समुदायों की गतिकी ।	डॉ. एस.एन. सिंह	अप्रैल, 2004	मार्च, 2006
मीठे जलवाले जलाशयों की पारिस्थितिकी एवं मात्स्यकी	डॉ. डी.एस.कृष्णा राव	अप्रैल, 2002	मार्च, 2007
उत्तर प्रदेश के कुछ चुने हुए जलाशयों की पारिस्थितिक स्तर एवं उत्पादन क्षमता	डॉ. ए. के. लाल	अप्रैल, 2002	मार्च, 2005
राजस्थान के छोटे जलाशयों की पारिस्थितिकी एवं मात्स्यकी	डॉ. वी. के. शर्मा	अप्रैल, 2002	मार्च 2005
हिमाचल प्रदेश के जलाशयों में विदेशी कार्प मछलियों का स्तर	डॉ. वी.के. शर्मा	अप्रैल, 2004	मार्च, 2007
भारत के आर्द्र क्षेत्रों में मत्स्य उपज की वृद्धि हेतु पारिस्थितिक अनुकूल प्रबन्धन प्रणालियों का विकास	डॉ. ए. मुखर्जी	अप्रैल, 2002	मार्च, 2007
कायमकुलम झील की पारिस्थितिकी एवं जैव-विविधता	डॉ. एस. बिजय नंदन	अप्रैल,2002	मार्च,2005
मध्य एवं पश्चिमी उत्तर प्रदेश के आर्द्र क्षेत्रों की पारिस्थितिक स्तर एवं ऊर्जा गतिकी ।	डॉ. धीरेन्द्र कुमार	मई,2002	मार्च, 2005
मत्स्य एवं अंतर्स्थलीय जलीय परितंत्रों में स्वास्थ्य एवं संबद्ध जैविक पहलुओं का समग्र मूल्यांकन	डॉ. मानस कुमार दास	अप्रैल, 2000	मार्च, 2008
रिमोट सेंसिंग प्रणाली द्वारा अंतर्स्थलीय मात्स्यकी संसाधनों का सूचीकरण एवं डाटाबेस का विकास	श्री आर. ए. गुप्ता	अप्रैल, 2002	मार्च, 2007

मुख्य घटनायें / समारोह

संस्थान के मुख्यालय में पूरी निष्ठा के साथ स्वतंत्रता दिवस मनाया गया । इस अवसर पर संस्थान के निदेशक ने राष्ट्रीय ध्वज फहराया ।

इसी प्रकार गणतंत्र दिवस भी पूरे हर्षोल्लास के साथ मनाया गया ।

सतर्कता जागृति सप्ताहः- संस्थान में 1 नवम्बर से 6 नवम्बर, 2004 के दौरान सतर्कता सप्ताह का आयोजन किया गया । इस आयोजन के दौरान संस्थान के कर्मचारियों को शपथ दिलाई गयी एवं सतर्कता से संबंधित आदेशों आदि पर व्याख्यानों का भी आयोजन किया गया ताकि संस्थान में इसके प्रति अधिक जागरुकता लायी जा सके ।

खेल-कूदः- आई.सी.ए.आर. जोनल स्पोर्टस मीट जोन-3 का आयोजन कोलकाता में 14-18 जनवरी, 2005 के दौरान किया गया । इस आयोजन में संस्थान की विशेष उपलब्धियाँ प्राप्त हुईं तथा एवं श्री मानवेन्द्र रॉय को *बेस्ट एथलेट एवार्ड* से सम्मानित किया गया है ।

हिन्दी सप्ताहः- संस्थान में 14-20 सितम्बर, 2004 के दौरान हिन्दी सप्ताह का आयोजन किया गया । इस सप्ताह में अनेक प्रतियोगिताएँ जैसे हिन्दी निबन्ध लेखन, पत्र एवं टिप्पणियाँ लेखन, शब्दावली आदि का आयोजन किया गया । समापन समारोह में सभी अधिकारी एवं कर्मचारी उपस्थित हुए एवं इस अवसर पर निदेशक महोदय ने अपने दैनिक राजकीय कार्यों में हिन्दी को बढ़ावा देने की अपील की ।

संस्थान के उत्तर-पूर्वी प्रादेशिक केन्द्र, गुवाहाटी द्वारा राज्य सरकार के अधिकारियों के लिए अंतर्स्थलीय मात्स्यकी डाटाबेस विकास नामक सेन्ट्रल सेक्टर परियोजना के अंतर्गत 2-7 सितम्बर, 2004 के दौरान एक प्रशिक्षण-सह-कार्यशाला का आयोजन किया गया ।

उत्तर-पूर्वी भारत के विवृत्त जल क्षेत्रों में पेन प्रणाली विषय पर 2-3 नवम्बर, 2004 के दौरान NATP-JV परियोजना के तहत एक दो दिवसीय कार्यशाला का आयोजन किया गया ।

मत्स्य पालक दिवस

राष्ट्रीय कृषि प्रौद्योगिकी परियोजना (जय विज्ञान) की उप-परियोजना *असम के जन-जातीय एवं ग्रामीण क्षेत्रों के बीलों में पेन प्रणाली द्वारा मीठे जल मत्स्य उत्पादन की वृद्धि* हेतु असम राज्य के करीमगंज जिले में बदरपुर ग्राम में मत्स्य पालक दिवस का आयोजन किया गया ।

पश्चिम बंगाल के उत्तर 24 परगना जिले में हसनाबाद शहर में 17 मई, 2004 के दिन चावल-व-मत्स्य पालन विषय पर एक मत्स्य पालक दिवस का आयोजन किया गया जिसमें 50 मत्स्य पालकों ने सक्रिय रूप से भाग लिया ।

केन्द्रीय अंतर्स्थलीय मात्स्यकी अनुसंधान संस्थान, इलाहाबाद ने नदीय मात्स्यकी से प्राप्त पोना एवं विकसित मछलियों के संग्रहण पर एक जागरूकता अभियान प्रारंभ करने के विषय पर एक कार्यक्रम का आयोजन किया ।

पश्चिम बंगाल के बरह्मपुर में 2 अगस्त, 2004 को मत्स्य पालक दिवस का आयोजन किया गया जिसमें 50 नदीय मत्स्य बीज संग्रहणकर्त्ताओं ने भाग लिया ।

सीखला में दिनांक 15 दिसम्बर 2004 को आयोजित मत्स्य पालक दिवस में भाग लिया गया जिसमें मत्स्य पालक समुदाय को जल निकायों में कीटनाशकों के दुष्प्रभाव के बारे में बताया गया ।

हरियाणा मत्स्य विभाग द्वारा पानीपत में दिनांक 14 जुलाई, 2004 को आयोजित 17वीं मत्स्य पालक दिवस में दिवस में भाग लिया गया जहाँ श्री डी.एन.मिश्रा, प्रभारी अधिकारी एवं प्रधान वैज्ञानिक ने मात्स्यकी प्रबन्धन पर एक व्याख्यान दिया ।

विशिष्ट अतिथिगण

इस अवधि के दौरान संस्थान के मुख्यालय एवं अनुसंधान केन्द्रों का निम्नलिखित विशिष्ट अतिथियों ने संदर्शन किया ।

डॉ. एस.ए.एच. आबिदी, सदस्य, कृषि वैज्ञानिक चयन बोर्ड, नई दिल्ली ।

श्री आर. एन. श्रीवास्तव, भारतीय प्रशासनिक सेवा, निदेशक, उत्तर प्रदेश मत्स्य विभाग।

डॉ. एस.सी.पाठक, भूतपूर्व महाप्रबन्धक, राष्ट्रीय कृषि एवं ग्रामीण विकास बैंक ।

श्री बी. एन. सिंह, भूतपूर्व सहायक महानिदेशक (मत्स्य), भा.कृ.अनु.प. ।

प्रो. अनिता गोपेश, जीव विज्ञान विभाग, इलाहाबाद विश्वविद्यालय ।

प्रो. एस.एल. श्रीवास्तव, सहायक कार्यकारी अधिकारी, राष्ट्रीय विज्ञान अकादमी, इलाहाबाद ।

डॉ. अरविन्द मिश्र, मुख्य कार्यकारी अधिकारी, राज्य मत्स्य विभाग, प्रतापगढ़, उत्तर प्रदेश ।

श्री बी.पी. भारतीय, सहायक मत्स्य निदेशक, इलाहाबाद।

डॉ. अनूप चतुर्वेदी, प्रोफेसर सांख्यिकी विभाग, इलाहाबाद विश्वविद्यालय, इलाहाबाद ।

डॉ. सुशील चतुर्वेदी, प्रोफेसर, वनस्पति विज्ञान, नागालैंड विश्वविद्यालय, नागालैंड

डॉ. एस.बी. श्रीवास्तव, कार्यकारी प्रबन्धक, उत्तर प्रदेश मत्स्य विकास निगम, लखनऊ ।

डॉ. पी.एस. सिन्धु, विश्व बैंक।

डॉ. एस.एल. मेहता, भूतपूर्व राष्ट्रीय निदेशक, राष्ट्रीय कृषि प्रौद्योगिकी परियोजना, भा.कृ.अनु.परिषद्, नई दिल्ली ।

डॉ. पी.वी. देहाद्राय, भूतपूर्व उप-महानिदेशक (मत्स्य), भा.कृ,अनु,परिषद ।

डॉ. पी.एस.बी.आर. जेम्स, भूतपूर्व निदेशक, केन्द्रीय समुद्रीय मात्स्यकी अनुसंधान सस्थान, कोचिन ।

डॉ. मंगला राय, सचिव, कृषि अनुसंधान एवं शिक्षा विभाग तथा महानिदेशक, भारतीय कृषि अनुसंधान परिषद, नई दिल्ली ।

डॉ. एस.अयप्पन, उप-महानिदेशक (मत्स्य) भारतीय कृषि अनुसंधान परिषद, नई दिल्ली।

डॉ. वी.आर. चित्रांशी, सहायक महानिदेशक (मत्स्य), भारतीय कृषि अनुसंधान परिषद्, नई दिल्ली ।

डॉ. एस.डी. त्रिपाठी, भूतपूर्व निदेशक, केन्द्रीय मत्स्य शिक्षा संस्थान, मुंबई ।

प्रो. ब्रिज गोपाल, जवाहरलाल नेहरु विश्वविद्यालय, नई दिल्ली ।

डॉ. मार्क प्रेइन, परियोजना प्रमुख, वर्ल्ड फिश सेन्टर, पेनांग, मलेशिया ।

डॉ. मदन डे, वर्ल्ड फिश सेन्टर, दक्षिण-पूर्वी देश ।

डॉ. आर्थर रिबोर्ट, MRAG, UK ।

डॉ. क्रिस बेन्न्, वर्ल्ड फिश सेन्टर ।

डॉ. के.वी. देवराज, भूतपूर्व उप-कुलपति, कृषि विज्ञान एवं प्रौद्योगिकी विश्वविद्यालय, बैंगलोर ।

डॉ. एच.पी.सी. शेट्टी, निदेशक, मैंगलोर फिशरीज कॉलेज ।
डॉ. ए. के. बन्धोपाध्याय, उप-कुलपति, पश्चिम बंगाल पशु एवं मत्स्य विज्ञान विश्वविद्यालय ।
डॉ. सरोजिनी पिल्लई, भूतपूर्व वैज्ञानिक, के.अ.मा.अनु.संस्थान
डॉ. एस.डी.शर्मा, निदेशक, भारतीय कृषि साख्यिकी अनुसंधान संस्थान, भारतीय कृषि अनुसंधान परिषद, नई दिल्ली ।
डॉ. ए. के. भट्टाचार्या, संयुक्त सचिव, पशु पालन एवं डेरी विभाग, कृषि मंत्रालय, भारत सरकार ।