



The Inland Fisheries News

Newsletter of the Central Inland Capture Fisheries Research Institute

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Ecological and Fisheries Status of Reservoirs in India - A recent survey

CIFRI has initiated rapid survey of the reservoirs in various states of India. As part of the work programme investigations were conducted by the scientists of CIFRI in selected reservoirs of the States of Tamil Nadu, Andhra Pradesh, Haryana, Punjab and Himachal Pradesh to assess their present ecological and fisheries status and to formulate guidelines for the development of fisheries of these reservoirs.

Reservoirs of Tamil Nadu

The reservoirs Amaravathy, Palar-Poranthalar, Uppar, Pillor, Gunderipallam and Varattupallam were surveyed.

The investigations revealed that the soil in all the reservoirs were poor in essential nutrient content indicating low to medium productivity of the reservoirs. Primary productivity was highest in Varattupallam ($1166.4 \text{ mg day}^{-1}$) followed by Gunderipallam, Palar - Poranthalar, Uppar, Pillor and Amaravathy. Accordingly the fish yield was also observed to be highest in Varattupallam $196.79 \text{ kg ha}^{-1}$ and lowest in Amaravathy 48.06 kg ha^{-1} .

The fish species diversity in these reservoirs is poor. *Oreochromis mossambicus* only breed in all the reservoirs. In the absence of natural recruitment of Indian and exotic cultivable carps in the reservoirs regular stocking of farm produced fry and fingerlings of Indian major carp is done every year in all reservoirs except Varattupallam.

Taking into consideration the area of the reservoirs and stocking density, one can conclude that the fishery management in Palar - Poranthalar is best followed by Amaravathy and Uppar, while it was poor in Pillor. The actual fish yields obtained from the reservoirs are less

compared to the production potentials estimated through primary production studies. This gives scope for enhancement of fish production from these reservoirs through judicious stocking and exploitation.

Reservoirs of Andhra Pradesh

Survey of nine reservoirs viz. Nagarjunasagar, Srisailem, Musi and Wyrā (Krishna river system); Singur, Kadam and Lower Manair Dam (LMD) (Godavari river system); Mid Penna Dam (MPD) and Somasila (Penna river system) in Andhra Pradesh was conducted.



Going deep into the Nagarjunasagar for sampling

Mean depth of Nagarjunasagar and Srisailem were 50-60 m and average depth of most of the reservoirs were 12 to 20 m except Wyra (6 m) and Moosi (7 m).

Based on the limno-chemical studies Wyra was the most productive reservoir followed by Kadam, Srisailem, Mid Pennar Dam and Somasila. Lower productivity was noticed in Lower Manair Dam, Singoor and Nagarjunasagar.

Amongst the nine reservoirs surveyed Moosi was found to be the most polluted one as the Hyderabad city sewage is being dumped in it.



A haul of *C. catla* from Nagarjunasagar reservoir

Most of the reservoirs have the necessary infrastructure for raising the seed and exploitation of the fishery. Co-operative societies need to be activated and given the responsibility of management.

The steep water level fluctuations in many of the reservoirs is a constraint to introduce pen culture to raise the seed. Any reservoir which gets filled up early during monsoon and retain level for 2-3 month would be suitable for pen culture.

There is an immense scope to introduce cage culture system in most of the reservoirs. This will enhance the yield from reservoirs and also provide additional employment.

Reservoirs of Haryana, Punjab and Himachal Pradesh

The reservoirs investigated were the Badleham and Peacock in Haryana; Dholbaha, Janauri and Maili in Punjab and Chamera in Himachal Pradesh.

The investigations revealed small reservoirs to form an important fisheries resource in these states. Dholbaha, Janauri and Maili reservoirs in Punjab did not have a natural fishery. The fish catches are dominated by culturable fishes - *C. carpio*, *L. rohita*, *C. idella*, *C. mrigala* and *C. catla* which are stocked every year by the state fisheries department without taking into consideration the biogenic productivity of the ecosystem. Thus, the catch from these reservoirs depend heavily on a sustained annual stocking. The measure suggested for enhancing the fish yield from these reservoirs are (i) a stocking rate of 250 fingerlings ha⁻¹, (ii) operation of gill nets of mesh bar 40 to 80 mm, (iii) use of drag net during drying of the reservoir to ensure total harvest, (iv) prevention of fishes escaping by putting suitable wire mesh screen at the spillway and channel mouths. Stocking of *C. idella* could prove useful in checking the growth of macrophytes like *Hydrilla*, *Potamogeton* and *Marsilea* in some reservoirs, like Badkhal. Heavy stocking with *C. idella* could solve this problem. In Chamera reservoir in Himachal Pradesh a continued stocking of cold water species like *S. plagiostomus*, *Salmo trutta fario*, *T. putitora* and *C. carpio* could prove useful for the development of fisheries.

A new light on hilsa fisheries above Farakka Barrage

The Farakka barrage is widely believed to have caused hindrance for the anadromous hilsa to migrate further upstream thereby, resulting in a decreased abundance of the species above the barrage. Investigations conducted earlier pin pointed a drastic fall in the catch of the species in the stretches of river Ganga above Farakka barrage, excepting some years when sporadic higher landings were recorded. Recent investigations conducted by scientists of the Hilsa

Division of CIFRI, however, have thrown new light on the availability of hilsa juveniles and adults in a 35 km stretch between Farakka and Manikchawk, above the barrage.

It is evident that breeding of hilsa, immediately above Farakka barrage, is a reality. However, it appeared that success of breeding and recruitment is directly related to the intensity and duration of flood. Higher level and longer spell of flood helped matured specimens to negotiate the barrage in greater numbers. Data clearly demonstrates higher landing following the flood in September to October, which is further substantiated by the observations made during exploratory survey of River Ganga, which elucidated on the presence of hilsa throughout the stretch between Farakka and Barauni.



A haul of *T. ilisha* at Taltalaghat (Farakka)

River Godavari - A rapid survey

CIFRI has initiated a rapid survey of the ecological and fishery status of all the major rivers in the country. Work on rivers Ganga, Mahanadi and Brahmaputra have already been completed. As part of the work programme detail investigations are being carried out in river Godavari.

The river Godavari arising in the North Western Ghats near Nasik at an elevation ranging from 1219 - 1525 m (msl) courses 1465 km through Maharashtra and Andhra Pradesh and joins into Bay of Bengal. The river course in upper stretch of Maharashtra is narrow and swift flowing. Flood water discharge in this part is just 10.5% of the total yield. In post-monsoon season the river is shallow with depth ranging from 0.5 to 3.0 m. Water quality is congenial for fish production. Fishing activity is mostly of subsistence level and confined to areas around dams and weirs. In the middle stretch in Andhra Pradesh the average depth range is 1 to 10 m. Fishery consists of large carps - *C. catla*, *C. mrigala*, *L. fimbriatus* and catfishes - *A. seenghala*, *A. aor* and *W. attu*. The lower stretch of the river in Andhra Pradesh is wider and deeper. Water quality is favourable for production in this stretch. This stretch is exploited heavily, with maximum fishing intensity in the estuarine zone. The target species is the prawn, *Macrobrachium malcolmsonii* as it commands good price. The investigation is continuing.

EXTENSION SCENE

Activities of Krishi Vigyan Kendra

Krishi Vigyan Kendra, Kakdwip conducted training programmes in different disciplines of Fisheries, Agriculture, Animal Sciences and Home Sciences for the benefit of farmers of South 24 Parganas district.

Discipline	No. of courses	Duration of course (days)	No. of trainees					
			SC/ST		Others		Total	
			Male	Female	Male	Female	Male	Female
Fishery	11	2-5	32	11	150	33	182	44
Agro-nomy	17	2-5	72	18	226	61	298	79
Horticulture	14	2-5	75	17	220	10	295	27
Animal Science	14	2-15	32	15	145	43	177	58
Home Science	13	2-10	-	54	-	187	-	241
TOTAL	69	-	221	115	741	334	952	449



Scientists of KVK discussing with farmers and farm women

INFRASTRUCTURE DEVELOPMENT

Inauguration of Ecotoxicological Laboratory at CIFRI

The long awaited laboratory for toxicological experimentations under simulation was inaugurated by Prof. H.P.C. Shetty, Chairman, Research Advisory Committee on 27th April 1998. The laboratory is equipped to evaluate tolerance limits for various toxicants and also to ascertain biological/physiological stress related effects in fishes and other biotic organisms. Besides, avoidance reactions in fishes for stress factors like hyperthermism and organic and inorganic contaminations is also being investigated.

The Ecotoxicological Laboratory in operation would facilitate critical analysis of environment and biocommunity relationship essential for Environmental Impact Assessment conducted under the Research Projects of the Institute and also consultancy Projects entrusted to Central Inland Capture Fisheries Research Institute by different National and International agencies.

Dr. H.P.C. Shetty inaugurating the Ecotoxicological Laboratory at CIFRI, Barrackpore



Dr. H.P.C. Shetty and other distinguished members of RAC seeing the facilities in the Ecotoxicological Laboratory

MEETINGS

Research Advisory Committee

The fourth Research Advisory Committee meeting of the Institute was held at Central Inland Capture Fisheries Research Institute, Barrackpore on 27th April 1998 under the Chairmanship of Prof. H.P.C. Shetty and attended by other members viz. Dr. J.R.B. Alfred, Dr. P. Das, Dr. (Mrs.) R. Dalwani, Dr. P.C. George, Shri S. Halder, Shri Anil Agarwal and Dr. M. Sinha.



Research Advisory Committee meeting in progress

After the introductory remarks by the committee members and discussion on the Action Taken Report of the last meeting, the Heads of Divisions presented the progress and achievements under various projects. After a thorough discussion on various research projects, recommendations for future research programmes were formulated. In his concluding remarks the Director, CIFRI, thanked everybody for the deliberations made and assured the members that the suggestions given will be incorporated in future work programmes of the Institute.

Management Committee Meeting

The 21st meeting of CIFRI Management Committee was held at Barrackpore on 28th April 1998 under the Chairmanship of Dr. M. Sinha, Director, CIFRI. The meeting was attended by Sri Anil Agarwal, Sr. Scientist, ICAR; the Dean, Faculty of Fisheries, University of Animal Sci. & Fisheries, West Bengal; Sri Susanta Halder, Progressive Fish Farmer, Calcutta; Sri A.P. Trivedi, F&AO, CRIJAF, Barrackpore; and other members from the Institute.

In the meeting the Committee confirmed the proceedings of its last meeting and discussed in length on four agenda items and made recommendations.

Annual Staff Research Council Meeting

The Annual Staff Research Council meeting of the Institute, chaired by Dr. M. Sinha, Director, CIFRI, was held on 29th and 30th April 1998. The Project Leaders presented the progress achieved under all the 18 research projects implemented by the Institute during 1997-98. The future programme of work under each Division was also discussed in the meeting.



Scientists presenting their research achievements

Concluding the two day session of SRC, the Director emphasized on the need to understand and adopt the new system of Project Based Budgetting and thanked all the members for their scientific presentation and fruitful interaction and suggestions in the deliberation of the SRC. He exhorted all scientists to achieve scientific excellence in their field of specialization.

Joint Staff Council Meeting

The meeting of the Joint Staff Council of CIFRI was held on 1st June 1998 at Barrackpore under the Chairmanship of Dr. M. Sinha, Director. The members, official side as well as staff side attended the meeting and deliberated on the agenda items.

HUMAN RESOURCE DEVELOPMENT

Award



Dr. Maniranjana Sinha
Director, CIFRI

Dr. Maniranjana Sinha, Director, CIFRI was awarded the **Fellowship of Nature Conservators (F.N.C)** by the executive council of **Nature Conservators** (An International Social & Scientific Organisation), Muzaffarnagar.

Dr. Maniranjana Sinha, Director, CIFRI was also awarded **FZS** (Fellow of Zoological Society) by Zoological Society of Calcutta, India.

Training

Shri Debabrata Das, Scientist (Computer Application in Agriculture) was deputed to attend the 62nd FOCARS training Programme organised at NAARM, Hyderabad during the period 07.01.1997 to 05.05.1998.

ICAR Zonal Sports Meet

CIFRI sports contingent came out with flying colours in the ICAR Sports Final Meet (Zone 1) held at CPCRI, Kasergode from 2-5 May 1998. The Institute contingent bagged 9 gold medals in the meet. Shri M. Roy of CIFRI was adjudged the best athlete of the Zone I.



Shri M. Roy receiving the best athlete award from
the Secretary, ICAR

Staff News

Appointment

Shri Jeetendra Kumar Singh	T-I	15.01.1998
Shri Kuldeep Singh	T-2	12.01.1998
Shri Subrata Das	T-2	27.01.1998
Shri R. Balamurugan	T-I	09.02.1998
Ms Ruma Roy Ghatak	Junior Clerk	23.02.1998
Shri Biswajit Barua	Junior Clerk	23.02.1998
Shri Kishore Shaw	Junior Clerk	11.03.1998
Shri Rabiul SK.	T-I	12.06.1998
Shri Shabbir Ahmed	SSG-I	23.04.1998
Shri Sukhen Das	SSG-I	09.06.1998
Shri Prabodh Ranjan Mahata	SSG-I	15.06.1998

Promotion

Shri Baij Nath, Senior Clerk	Assistant	07.03.1998
Shri Samir Kumar Roy, -do-	-do-	02.03.1998
Shri S.B. Roy, -do-	-do-	02.03.1998
Shri P. Lahiri, -do-	-do-	25.06.1998
Shri S.K. Tikadar, Jr. Clerk	Senior Clerk	04.03.1998
Ms Mrinalini Banerjee, -do-	-do-	02.03.1998
Ms Amita Chakraborty, -do-	-do-	03.03.1998
Shri S. Karmakar, -do-	-do-	25.06.1998
Shri U.B. Bhattacharyya, -do-	-do-	25.06.1998

Promotion from SSG-I to SSG-II

Shri A. Bhattacharjee	Shri B. Gharami
Shri J.K. Patra	Shri B.K. Halder
Shri Nayantara Dalui	Shri Ram Pada Halder
Shri S.N. Nanj	Shri Mahendra Balmiki
Ms. Anjali Rani Dutta	Shri Gopal Chand
Ms. Rupali Chatterjee	Ms. Godhuli Mondal
Ms. Dhanamaya	Shri Laxmi Ram
Shri Ashok Kumar Dey	Shri Hari Pada Bhanja
Shri Tarapada Ghosh	Shri Jairam Prasad
Ms. B. Sakuntala	Shri R.K. Sardar
Shri A.K. Bhanja	Shri S.C. Sadhukhan
Shri S. Banerjee	Shri D. Chakraborty
Shri B.P. Samanta	Shri B.P. Mishra
Shri B.N. Bose	Shri T.K. Gayan
Shri P. Atchaiah	Shri Swapan Gayan
Shri Anil Chandra Das	Shri Sibulal Das
Shri S. Govindarajan	Shri A. Kistaiah
Shri K.C. Das	Ms. Mina Rani Biswas
Ms. B. Balmiki	Shri Dilip Kumar Das
Shri Manabendra Dutta	Shri K.C. Malakar
Shri N. Rajak	Shri M. Panika

Transfer

Dr. P.K. Katiah, Scientist (Sr.Scale)	Allahabad to Barrackpore
Dr. Sandeep Bhatia, Scientist	Barrackpore to Allahabad
Shri S.K. Srivastava, T-4	Karnal to Allahabad
Shri Khemchand Balmiki, SSG-III	Barrackpore to Calcutta
Shri Jamlal Balmiki, SSG-I	Calcutta to Barrackpore
Smt. Rani Palaniswamy, Scientist (Sr.Scale)	CMFRI, Cochin to CIFRI, Coimbatore

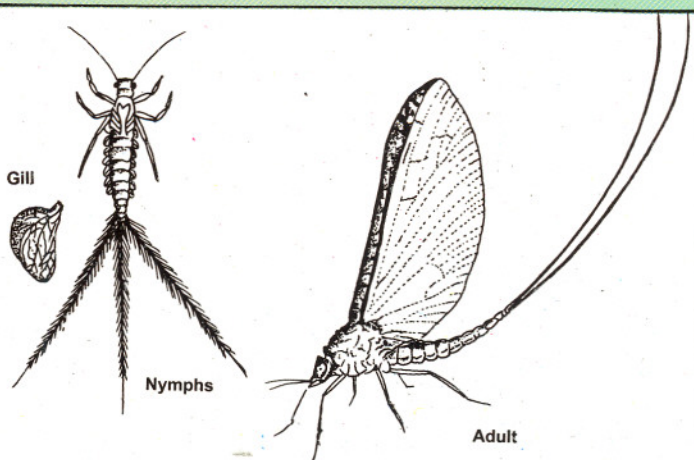
Retirement

Shri A Gangaiah, SSG-II	01.01.1998
Shri S. Kotaiah, T-2	31.01.1998
Shri P. Seshanna, SSG-III	31.01.1998
Shri Asadur Rahman Chowdhury, Sr. Scientist	28.02.1998
Shri N.K. Srivastava, T-5	28.02.1998
Shri S.R. Halder, Assistant	31.03.1998
Ms Sandhya Majumder, Superintendent	31.03.1998
Shri R.K. Das, Sr. Scientist	30.04.1998

The World of Aquatic Insects

Insects have successfully adapted to most varied and diverse types of environment. As a group, they even constitute a dominant part of the littoral fauna. Barring a few, most of these insects are however partially aquatic and spend a major part of their life cycle in water. There they occupy different trophic levels of the food chain and also play a vital role in consuming organic wastes of the ecosystem.

Mayfly : Very short lived winged adults of the order Ephemeroptera (*ephemeron* - living a day, *pteron* - wing) are commonly called Mayfly as they usually emerge from water in large numbers during the month of May. They lay eggs on water surface which sink to the bottom and develop into nymphs. The nymphs pass through several moults in about 1-3 years time to become full grown, and then crawl out of water to transform.



Nymphs are mainly herbivorous and are primary converters of plant material into animal protein. They constitute a significant component of the zoobenthos and themselves form an important food item of fishes. The mature nymphs are about 3-28 mm long and are provided with (2-3) long caudal appendages, and a set of external gills on thorax and abdominal segments. These organs however vary in shape, size, position and structural details within the order. The common ones belong to caenis, cloeon, baetis, etc. and are found in all types of water bodies, viz., ponds, pools, streams and rivers.

LIBRARY

New Additions (Books)

Economics of Fisheries - a case study of Andhra Pradesh by Rao, N. Subba. FAO, Rome. Daya Publishing House, Delhi

Freshwater prawn farming (FAO Fisheries Technical Paper 225). A manual for the culture of *Macrobrachium rosenbergii* by New Michael B. & Somsuk Singholka. FAO, Rome. Daya Publishing House, Delhi

Recent advances in fish ecology, limnology and eco-conservation. Vol.1 to Vol. 4, by Nath Surendra ed. Daya Publishing House, Delhi

Physical processes in estuaries, by Dronkers, Job, Wisn Van Leussen (eds.). Springer-Veslag, London.

Freshwater Biology, 2nd ed., by Edmondson, W.T. ed. International Books & Periodicals Supply Service, New Delhi (Indian ed.)

Assessment of water pollution, by Mishra, S.R. APH Publishing Corporation, New Delhi

River pollution in India : A case study of Ganga river by Sabata Binoda Chandra & M.P. Nayar. APH Publishing Corporation, New Delhi

Ecology and pollution of Ganga river (A limnological study at Hardwar) by Khanna Dev Raj., Ashish Publishing House, New Delhi

Environmental impact of large reservoir projects on human settlement (A case study of upper Kolab project in Orissa) by Dalua A.K., Ashish Publishing House, New Delhi

Environmental impact of sewage and effluent disposal on the river system by Palharya J.P. & V.K. Siriah, Shobha Malviya. Ashish Publishing House, New Delhi

Ganges ecology and pollution (in Hindi) by Chandra Suresh. Ashish Publishing House, New Delhi

Ganga : A water marvel by Shukla A.C. & Vandana A., Ashish Publishing House, New Delhi

Brackishwater aquaculture development in India (Status and task ahead) by Srivastava U.K, B.H. Dholakia & S.Vathsala. Concept Publishing Co., New Delhi

Statistical methods for biologists (Biostatistics) by Palanichamy & M. Manoharan. Palani Paramount Publication

Ecology of river Narmada by Unni K. Sankaran. APH Publishing Corporation, New Delhi

to be contd. 

From the Editors desk

Fisheries enhancement is a term which we frequently come across nowadays. What exactly does it mean ? Enhancements are primarily measures to increase the benefits over and above what is being achieved by sound management. This may be in the form of stocking reared fingerlings to increase recruitment of desired species or habitat modifications or aiding migration of fishes. Enhancement measures are very fruitful in altered ecosystems such as reservoirs, beels or other flood control schemes where natural recruitment of valuable fish species may be insufficient to fully utilize the systems productive capacity. Investigations conducted by scientists of CIFRI in Thirumoorthy and Aliyar reservoirs in Tamil Nadu clearly show the impact of enhancement measures. In these reservoirs the fish yield could be enhanced substantially from an average yield of 26 kg ha⁻¹ yr⁻¹ to 132 to 136 kg ha⁻¹ yr⁻¹. It also points out to the fact that the small reservoirs in our country can contribute significantly even if a modest yield of 100 kg ha⁻¹ yr⁻¹ is achieved by the enhancement measures.

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