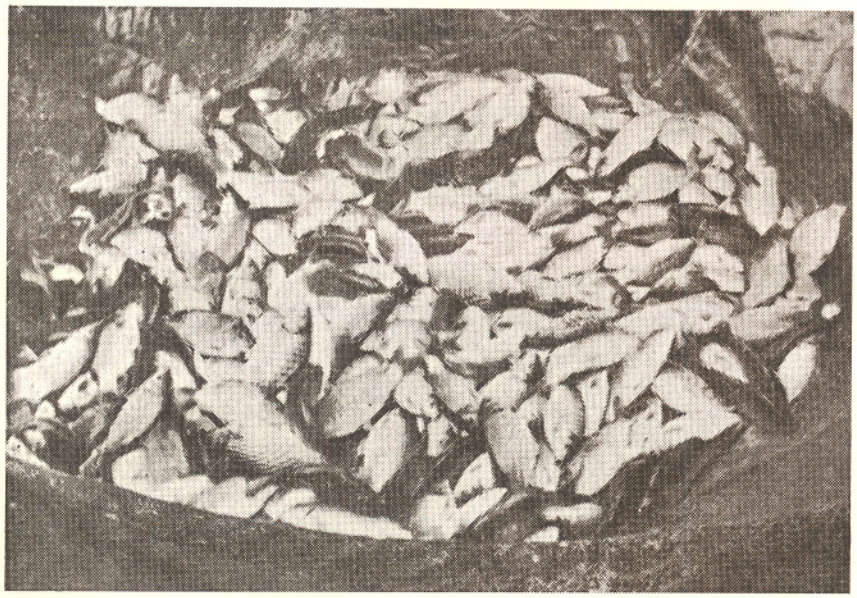
CIFRI NEWSLETTER

Volume 4 July-August 1981 Number 4

# CAGE CULTURE IN TANKS TO AUGMENT PRODUCTION

# *Tank Fisheries go well with a cage culture blend*



**The existing capture fishery of the peninsular tanks can be profitably blended with cage culture. So do the successful experiments conducted in the Sankey Tank, Bangalore indicate. A 10 1/2 sq.m. cage produced nearly 100 kg of common carp in 6 months. This is equivalent to 200 tonnes/ha/yr. A farmer can easily raise 1000 kg of fish in 50 sq. m cage area in an year. In the State of Karnataka alone 296,316 ha of seasonal and perennial tanks are availabale.**

Common carp fingerlings stocked at the rate of 300 per cage ( 2.8 lakhs/ha ) on 23rd February 1981 were harvested on 25th August with cent per cent survival. Fish production from the cage was 97 kg/cage/6 months. This works out to be 92 tonnes/ha/6 months nearly achieving the target of 100 tonnes. Synthetic cloth cages were floated as rearing enclosures. Deoiled silkworm pupae, a locally available feed was used in powder form.

## As nurseries too

In an earlier experiment, the cages were used for raising fingerlings of common carp and silver carp ( 8 : 1 ). The fry of the above fishes stocked at the rate of 2,250 per cage yielded fingerlings with 97.5% ( Common carp ) and 90.0% ( Silver carp ) survival.

## Achievement commended

The successful demonstration of raising fishes in such cages assumes special significance as a means to overcome the chief constraint of inadequate nursery and rearing space. In a function organised on the occasion of the completion of the experiment, the chief guest, Shri D. B. Pawar, the Hon'ble Minister of State for Fisheries and Ports lauded the scientists for their tireless efforts which culminated in a spectacular success. He pointed out that the research organisations like CIFRI "showed the way" by this type of demonstrations and it was upto the farmers to take maximum benefit out of the new techniques.

## Role of CIFRI technologies in socio-economic development

While delivering his presidential address, Dr. A. V. Natarajan, Director, CIFRI drew the attention of the elite gathering to the immense possibilities that aquaculture offers in elevating the economic and nutritional status of the Country. He pointed out, the application of various technologies developed at CIFRI would raise the potential of inland fish production to 4 million tonnes

and generate national income of the order of Rs. 2,000 crores. In addition, it will generate employment in aquaculture to the tune of 8 5 million people.

National and local press and AIR gave wide coverage to the function and the details of the experiments and the results were published and broadcast.

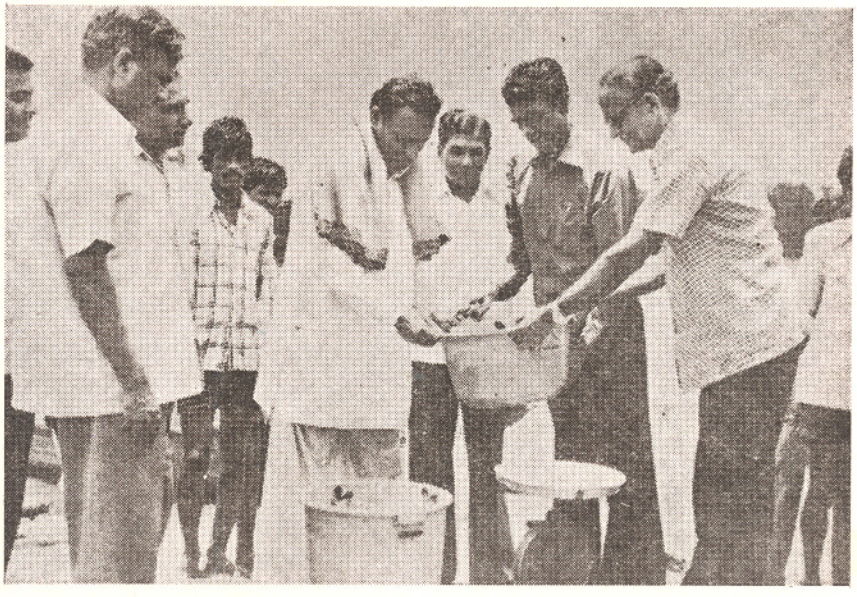
## Silver Carp in Reservoirs

The silver carp *Hypophthalmichthys molitrix* has established itself firmly in Gobindsagar Reservoir ( H. P. ). Although entered accidentally from the Deoli Fish Farm in 1971, the species has become a fishery of considerable importance in the reservoir. At present, it constitutes 12% of the total landings.

Silver carp is thriving well in Bhavanisagar Reservoir too. About 3,000 fry were introduced in the reservoir during December 1980. Three specimens caught between April and June 1981, measured 950 to 1050 g—a commendable growth indeed. The guts of these specimens were full of *Microcystis*.

Feeding at the base of the food chain, this fish is ecologically important and its introduction into Indian reservoirs is a subject of controversy due to the possible deleterious effects on indigenous stocks of fishes. That the silver carp thrives well in reservoirs has been established from the earlier experiences in Kulghari and Getalsud reservoirs.

*The cage at Sankey Tank being brought ashore for harvesting*

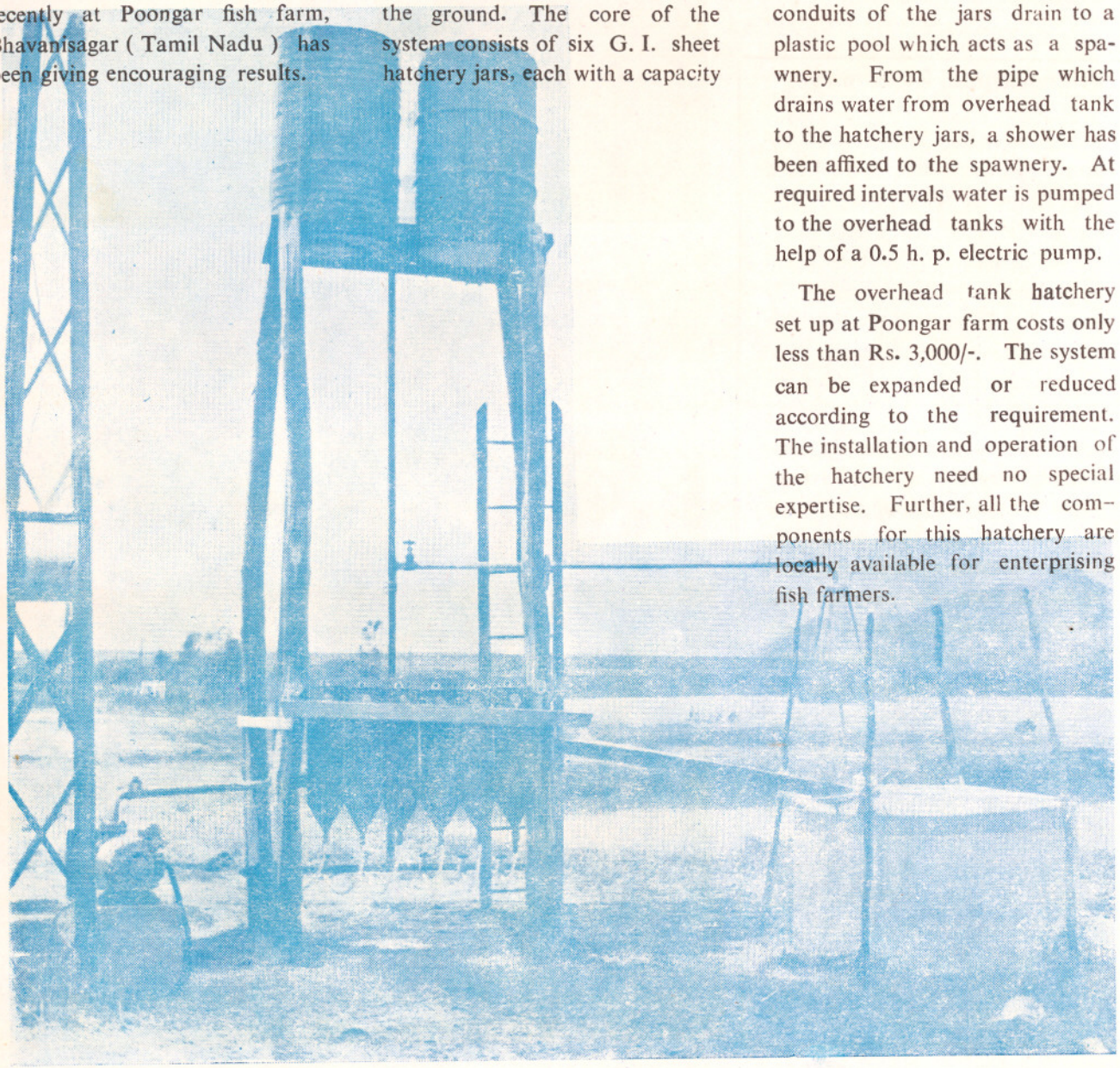


*Token presentation of Common carps to Hon'ble Shri D. B. Pawar by the Director Dr. A. V. Natarajan and Project Leader Shri B. V. Gavind*

# *A new field hatchery*

With a view to developing economically viable technologies in fish culture, a less expensive fish hatchery has been designed and installed at CIFRI. This field hatchery for carp eggs installed recently at Poongar fish farm, Bhavanisagar ( Tamil Nadu ) has been giving encouraging results.

Two empty oil barrels function as the overhead tank in this hatchery. These barrels having a capacity of 200 l each are mounted on a platform supported by casuarina poles at a height of ten feet above the ground. The core of the system consists of six G. I. sheet hatchery jars, each with a capacity to hold 2–2.5 lakhs of carp eggs. These are fixed on wooden plank attached near to the base of the poles. Each jar has an independent check valve system to regulate the water flow. The open conduits of the jars drain to a plastic pool which acts as a spawnery. From the pipe which drains water from overhead tank to the hatchery jars, a shower has been affixed to the spawnery. At required intervals water is pumped to the overhead tanks with the help of a 0.5 h. p. electric pump.



The overhead tank hatchery set up at Poongar farm costs only less than Rs. 3,000/-. The system can be expanded or reduced according to the requirement. The installation and operation of the hatchery need no special expertise. Further, all the components for this hatchery are locally available for enterprising fish farmers.

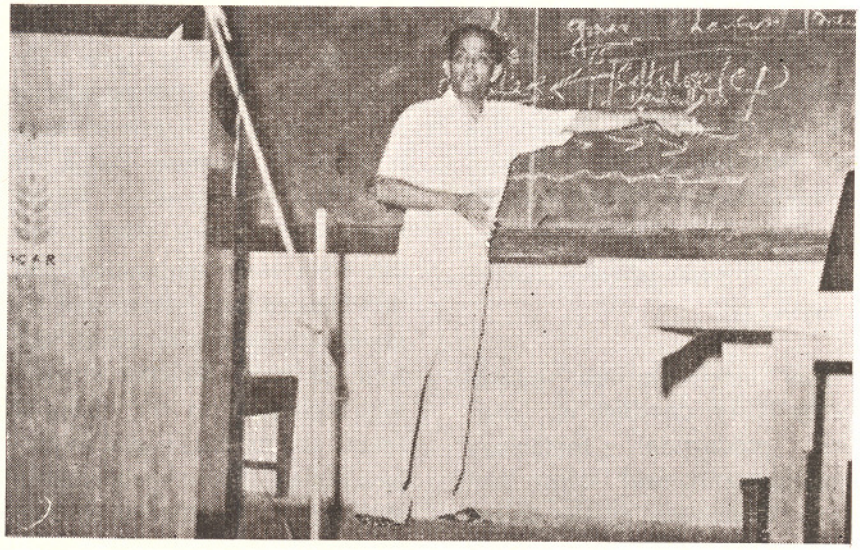
# *It pays to integrate various farming systems*


*Dr. A. N. Bose (left) inaugurating the Summer Institute. Dr. A. V. Natarajan, Director CIFRI is also seen in the picture*

Recent scientific advances have paved the way to blend our traditional practice of integrating various farming systems according to the present day needs. The adoption of this integrated system brings down the operational cost and increases yield per unit by recycling wastes. This aspect was well emphasised in the validictory function of the Summer Institute on Farming System Integrating Agriculture, Liverstock and Fish culture by Dr. A. V. Natarajan, Director, CIFRI. The validictory function organised at CIFRI on 4th August 1981 was attended by a number of scientists and research workers in the field of agriculture.

Dr. Natarajan opined that the Summer Institute dealt with a theme of great relevance. Integration of various farming systems has been in vouge in our country. However, the concept and scope of this integration have undergone radical changes with the passage of time. Scientific investigations have brought to light new avenues for enhanced production by wider adoption of this technology. Norms of utilising wastes as resources and attaining higher return from unit area well fit in this farming pattern, he added.

Earlier, while inaugurating the Summer Institute on 6th July, Dr. A. N. Bose, Ex-Vice Chancellor, Jadavpur University emphasised



*A Lecture class in Progress*

the importance of integrated culture systems in the wake of our recent awareness on limitations of uncontrolled exploitation of food resources. He pleaded for perfecting the expertise in integrated farming systems. Dr. Bose appreciated the techniques developed at CIFRI in integrating paddy culture, poultry, piggery and duckery with fish culture.

*Dr. Natarajan, Director distributing certificates and gift books to a trainee. Also seen in the picture are ( from left ) M/s. B. K. Sharma, Apurba Ghosh and B. N. Saigal, Associate Directors of the Summer Institute*

The Summer Institute was attended by 20 participants representing different universities, state departments and agricultural institutions. While distributing the certificates and books to the participants, Dr. Natarajan appealed them to make use of the knowledge acquired in the Summer Institute wherever opportunity arose.

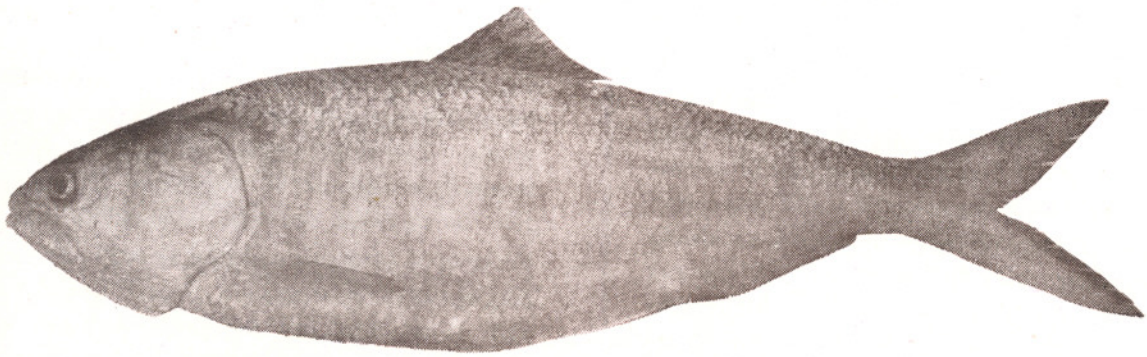
This Summer Institute sponsored by ICAR consisted of lectures, production technology demonstrations, field trips and group discussions relating to the concept of integrated farming systems.

KNOW YOUR FISHES - 2

## *Hilsa ilisha* — a gourmets' dream

Comparative palatability of fishes is often debatable. Yet it can be stated that the Indian shad *Hilsa ilisha* is a gourmet's dream for its unmatching taste. In Bengal, it is the choicest among fish delicacies and a pair of hilsa is offered to Goddess Durga on the Vijaya Dasami day. People in the eastern region adored this fish from time immemorial and they blended their folklore and legends with anecdotes about this fish. In ancient Sanskrit writings, hilsa is glorified as the "King of fishes" and its taste is said to surpass nectar. There was a remarkable degree of understanding about the biology of this fish in olden days and so much so many customary modes have been in vouge to protect this fish from reckless exploitation. In the State of West Bengal, eating of hilsa is a taboo from October to January ( when youug hilsa abound ) and thereafter it is ushered into the house as a ritual before restarting consumption. This abstinance is recommended as a prescription for health and prosperity—a covert conservation measure indeed.

Hilsa enjoys a very wide distribution in marine and freshwater gradients all along the Indian coasts. It forms a fishery of considerable importance in the major Indian rivers like Ganga, Brahmaputra, Mahanadi, Godavari, Krishna and Cauvery. It is also pre-



sent in the west flowing rivers. However, there is a marked abundance in the Bay of Bengal.

The migratory habits of hilsa make it a unique biological material capable of withstanding wide range of salinity and covering long distance against strong water currents. The lower regions of the estuary and the foreshore waters form the permanent habitats of hilsa. They migrate to the rivers for breeding. However, some riverine stocks in Ganga and Brahmaputra remain in freshwater areas throughout the year and they undertake the breeding migration within the freshwater zone. In Hooghly estuary, hilsa ascends upto about 298km upstream during the two breeding seasons. The freshwater stock of hilsa in Ganga covers a distance of about 1,287 km. In the river of Mahanadi, Godavari, Krishna and Cauvery the extent of migration has been greatly restricted by the construction of anicuts and dams. Young ones return to their permanent habitats when they attain the size of 15 to 22 cm.

Hilsa is a plankton feeder. Diatoms and copepods form the main food of larvae. Young hilsa feed generally on diatoms and sparingly on copepods, cladocerans and ostracods. Older ones are found to feed on insects, chironomid larvae etc. Females are larger than males. Depending on the size, females lay 2,50,000 to 16,00,000 eggs. Peak breeding season is monsoon ( June-July to September ) and there is a minor peak in winter (January-February). Going by the availability of young stages of hilsa, there is a view that breeding occurs throughout the year in Hooghly estuary.

Construction of fishways to enable the fish to ascend in spite of the barricades across rivers may go a long way in preserving this fish in the upper reaches of rivers. Attempts were also made to artificially propagate this fish with a view to rehabilitate them in rivers. CIFRI came out successful in this attempt for which the scientists engaged in the project were awarded the coveted Rafi Ahmed Kidwai Memorial Prize for the biennium 1978-79. CIFRI has also successfully demonstrated the rearing of hilsa in freshwater ponds.

*Systematic position* :

Order Clupeiformes
Suborder Clupeoidei
Family Clupeidae
Subfamily Clupeini
Genus *Hilsa*
Species *Hilsa ilisha*

Local names : *Hilsa* ( Hindi ), *Palasah* (Telugu), *Oolum* (Tamil), *Paliyah* ( Malayalam, Kannada ), *Pussai* (Oriya ), *Palla* ( Marathi ), *Ilish* ( Bengali, Oriya ). *Chaksi* (Narmada river), *Ilihi* (Assamese), *Pulla* (Sindhi).

## *ON THE ANVIL - 3*

### Economics in fishery investigations

Of late, there is an increasing awareness with regard to the role of economic factors in raising the status of inland fisheries from a level of subsistance activity to commercially viable enterprise. In successive plan periods a need has been keenly felt for adequate and appropriate research support for accelerated development. The CIFRI responded well to the challenge by undertaking research endeavours *viz.* Evaluation of infrastructural base in relation to institutional finance, marketing and legislation for propagation of aquaculture in W. Bengal, Cost-price structure of aquaculture in eastern region, Economic analysis of experimental, pilot-and large-scale fish farming operations in India, Determination of economic size of the farm, Economics of water use etc.

These indepth studies have been initiated with clearly defined objectives and well drawn out work plans. It will be possible in near future to identify factors which have either strengthened or weakned growth impulses. Further, recent technological advances have led to heavy dependance on monetised inputs resulting in higher capital requirements. This situation calls for renewed efforts on the parts of scientists to subject fish culture operation to rigorous economic evaluation that meets the tests of economic viability as evolved by financing agencies for securing a greater flow of loanable funds into inland fishery sector. Studies conducted so far reveal that fish production technologies can thrive well only when suitable investment climate is created by fiscal and nonfiscal inducements.

The Scientists engaged in the above mentioned investigations in CIFRI are :—S/shri M. Ranadhir, S. Paul, B. R. Shirsat, M. Rout, C. Saha, H. K. Sen and N. K. Tripathy. □

## *EXTENSION*

Extension Section of CIFRI continued to coordinate the Lab to Land Programme of the Institute's 31 centres covering 408 farm families. Of the 47 ponds which are under the direct control of the Section, five were harvested; the production obtained ranged between 2,506 to 3,898 kg/ha/7 months, much to the delight of the fish farmers.

During July–August, scientists of the Section produced about 1.6 million spawn of Chinese carps and 5 million spawn and 5.3 million fry of Indian major carps and handed over to the farmers – a remarkable achievement indeed.

The Extension Section participated in a seminar-cum-training programme organised by Loko Siksha Parishad, Ramakrishna Mission at Arapanch. Twenty six ponds belonaing to the farmers of the area were surveyed and on the spot suggestions were offered to improve the fish production.

### Demonstration on *Clarias* breeding

Under the programme of air-breathing fish culture in Kerala, induced breeding of *Clarias batrachus* was successfully demonstrated by CIFRI Scientists at Malampuzha fish seed farm near Palghat. The demonstration will enable the Directorate of Fisheries, Govt. of Kerala to establish an air-breathing catfish seed production centre in the district of Palghat. The endeavour is a part of large scale inland aquaculture programme drawn by the Govt. of Kerala.

*CIFRI'S SERVICES COMMENDED*

# চণ্ডীতলা থানা মৎস্যজীবি সমবায় সমিতি লিমিটেড

চণ্ডীতলা, হুগলী

রেফাঃ নং .....  তারিখ 24 June, 1981

From :- The President
The Chanditala Thana Matsyajibi Samavaya Samiti Ltd.,
Chanditala, Hooghly.

The Director,
Central Inland Fisheries Research Institute,
Barrackpore, 24-Parganas, West Bengal.

Sub :-Lab to Land Programme at Chanditala request for extension etc.

Sir,

In the beginning I convey our sincere thanks to you for your kind introduction of the Lab to Land programme in the Chanditala Area.

The fish farmers of this area numbering about 500 in 11 ( eleven ) Villages under 3 C. D. Blocks *viz* Domjur, Chanditala I and II did not have any knowledge of scientific fish farming prior to introduction of the above programme.

Due to direct involvement of the scientists of your Extension division with 36 selected farm families under the said programme and their other extension activities, we could know what scientific fish culture actually means, thereby increasing the fish production many fold.

Though we have been engaged in fish seed raising for many years we were facing the problem of mixed seed and their survival in nurseries, thereby reducing our over all return. But now many of us have learnt induced breeding and the scientific technology of seed raising with high rate of survival etc. In this way we could profitably produce about 2 crores of fry within a short period under the guidance of your scientists. In composite fish culture with only available Indian major carps, we had a production ranging between 2500 kg to 6140 kg/ha/yr against about 1200 kg/ha/yr. through our old system thereby increasing our income to about 3 to 5 fold.

Our success in yielding higher production has created lot of interest amongst other farmers of this area. So we hereby pray that this Lab to Land Programme/Extensions programme may kindly be extended by few more years to this locality to that other farmers can get the chance of having direct guidance from your Scientists insted of concluding the programme in the next year as was informed to us. I do hope that your goodself will do the needful and oblige.

Thanking you,

Yours faithfully,

Debendra Nath Das

চণ্ডীতলা থানা মৎস্যজীবি
সমবায় সমিতি লিমিটেড

Copy to : The Officer-in-Charge,
Extension Section,
C. I. F. R. I., Barrackpore,
for information and necessary action.

# CIFRI at the International Scene

## CIFRI Scientists at workshop

Shri. S. D. Tripathi, S-3 and Shri. M. Ranadhir, S-2 participated in a "Workshop on Economics of Aquaculture Research" held at Singapore from 2-5 June, 1981. This workshop organised by IDRC/ICLARM was attended by 31 scientists from nine countries. A paper, 'An economic analysis of composite fish culture' was presented at the workshop by the CIFRI scientists.

The workshop emphasised the unified role of economists and biologists in identifying priority areas in aquaculture practices that needed further probing. The involvement of economists become imparative when a technology is ready for pilot testing in farms, the workshop suggested. The gathering also recommended for bringing out a manual for economic analysis of aquaculture production systems, suitable for the region. □

## Hamza completes research programme at CIFRI

Mr. A. K. Hamza, Lecturer at Oceanography and Fisheries Research Institute, Egypt was conferred with the degree of Doctor of Philosophy by the University of Calcutta in August, 1981. He has been working on certain aspects of biology of the genus *Notopterus*. Mr. Hamza conducted his work at CIFRI under the Indo-ARE Cultural Exchange Programme. □

## Training to Bangladesh officials

A training programme for three days on induced breeding of Indian and exotic carps was organised for three Bangladesh officials, Mr. Mahiuddin Khan, Mr. Amin Ullah and Mr. Abdul Ouddus. They were sponsored by Danish Government under DANIDA, NIROP Programme. □

Ms. Srima Markalande, Department of Zoology, University of Colombo, Sri Lanka was at CIFRI from 2nd May to 27th July on a training programme under the Colombo Plan, sponsored by the British Council. Ms. Markalande was offered training in various aspects of inland aquaculture practices at different centres of CIFRI. □

# STAFF NEWS

## Ramachandran retires

Shri V. Ramachandran, Fishery Scientist retired voluntarily from the active services of CIFRI on 9th July, 1981. Looking back, Shri Ramachandran had a fruitful scientific career at CIFRI. He has left indelible marks in the annals of CIFRI by his original contributions leading to many innovations in chemical control of weeds. His contributions on the use of ammonia for aquatic weed control have gained wide acclaim. Even while he was with CIFRI, he offered consultancy services to the Department of Science and Technology, North Eastern Hill Council and many State Governments. □

## Dr. Mathew on deputation

Dr. P. M. Mathew, S-1 was relieved of his duties on 22-6-81 to join Kerala Agricultural University as Associate Professor on deputation. Shri. P. M. Sherief who was relieved on 6-11-1980 has joined KAU as Assistant Professor. □

## Wedding

Harbhajan Singh Raina, S-1 of the Srinagar Centre of CIFRI married Kanwal Jeet Kaur on 28th July 1981. The members of CIFRI family wish them a happy married life. □

## STAFF NEWS

### Transfers :

| Name | Designation | From | To |
|---|---|---|---|
| Shri. P. K. Saha | S-1 | Kalyani | Rahara |
| ,, P. L. N. Rao | ,, | Dhauli | Poona |
| Dr. M. L. Bhowmick | ,, | Barrackpore | Muzaffarpur |
| ,, S. P. Rai | ,, | ,, | ,, |
| Shri. K. B. Rajani | Assistant A. O. | Allahabad | Barrackpore |
| ,, K. B. Deb | Driver | Kakdwip | Calcutta |

### Appointments

| Name | Designation | Place |
|---|---|---|
| Shri. A. K. Chattopadhyay | Senior Training Assistant | KVK/Kakdwip |
| ,, N. T. Sadavaste | Junior Clerk | Poona |
| ,, S. Pari | Peon | Madras |
| Smt. Dhanmaya | ,, | Allahabad |

### Promotions

Following technical personnel were promoted to the next higher grade on the recommendations of Selection Committee for Technical Services.

| Name | From | To |
|---|---|---|
| Shri. N. K. Srivastava | T-II-3 | T-4 |
| ,, H. K. Mudulia | T-2 | T-II-3 |
| ,, Swapan Kr. Chatterjee | T-1 | T-2 |
| ,, Sukumar Saha | ,, | ,, ( Deputation ) |
| ,, K. C. Pani | ,, | ,, |
| ,, B. B. Das | ,, | ,, |
| ,, M. G. Subramani | ,, | ,, |
| ,, Kanchan Dutta | ,, | ,, |
| ,, U. K. Chatterjee | ,, | ,, |
| ,, Nirmal Biswas | ,, | ,, |
| ,, R. L. Balmiki | ,, | ,, |
| ,, Suraj Bahadur | ,, | ,, |

### Seminar/Training

Mr. B. B. Ghosh attended the Seminar on Environmental Pollution and Management organised by the Bihar State Water Pollution Control and Preservation Board at Patna on 18-7-1981. He presented a paper entitled 'Aquatic pollution in relation to inland fisheries' by A. V. Natarajan and B. B. Ghosh. □

Mr. R. K. Singh, S-1, attended the Summer Institute on Fertilizer use efficiency in relation to Crop Production held at A C R I P Madurai. □

Mr. B. N. Saigal, S-2, Mr. Rout, S-1 and Mr. B. R. Shirsat, S-1 have undergone computer training for ten days at IASRI, New Delhi from 10-8-'81. □

Dr. Peer Mohammed, Mr. K. P. Srivastava and Mr. N. K. Das have undergone the one month Orientation Course in Agricultural Research Management at NAARM, Hyderabad from 12-8-'81.

## *LIBRARY*

### New arrivals

### Books :

Whipple, George Chandler
The microscopy of drinking water. 4th ed.

Edminister, Frank C.
Fish ponds for the farm.

Jaiswal, N. K. and N. V. Kolte
Development of draught-prone areas.

Holcik, J. and J. Mihalik
Freshwater fishes.

Hand book of agriculture : Facts and figures for farmers, students and all interested in farming.
ICAR, 1980.

Current references in fish research. Volumes I-V, 1976-1980.
University of Wisconsin, Wisconsin, U. S. A.

### Departmental Publications :

Progress and achievements in aquaculture. Brochure on CIFRI, Barrackpore, August, 1981.

Summer Institute on farming systems integrating agriculture, livestock and fish culture ( July 6 — August 4, 1981 ).
CIFRI, Barrackpore. ( Mimeo )

*Edited by :*
B. N. Saigal, V. V. Sugunan, V. K. Unnithan, ( Mrs. ) G. K. Vinci and S. Paul.

*Published by :*
The Director, Central Inland Fisheries Research Institute, Barrackpore.

*Printed by :*
**ROMAN PRINTERS** ( S. S. I. Regd. Unit ) 37 Andul Road Howrah 711 109 West Bengal.