

## INDIA ON THE BRINK OF POLYCULTURE REVOLUTION

The Fish Farming International, in an article in its December, 1976 issue covered the achievements of the CIFRI which have the potentials of bringing about fish revolution in the country. The technique of polyculture of compatible Indian fish species (catla, rohu and mrigal) and the exotic fishes (silver carp, grass carp and common carp) in different combinations which occupy major ecological niches in the pond environment and the techniques of induced breeding and fry rearing at a high stocking density of 10 million spawn per hectare constituted the main theme of the article. The use of the swampy and derelict stretches of water, as ideal culture grounds for air-breathing fishes such as murrels, singhi, magur and koi and the use of sewage or sludge to fertilize fish ponds were also emphasised in the article. The Institute's efforts in laying emphasis on identifying riverine stretches where culturable varieties of fish breed naturally and the outstanding results claimed in inducing these varieties to spawn in captivity either by simulating riverine conditions or by selectively injecting them with pituitary

gland extract, were also highlighted in the article.

The article further stressed that according to an estimate of the Institute 1.6 million hectares of ponds

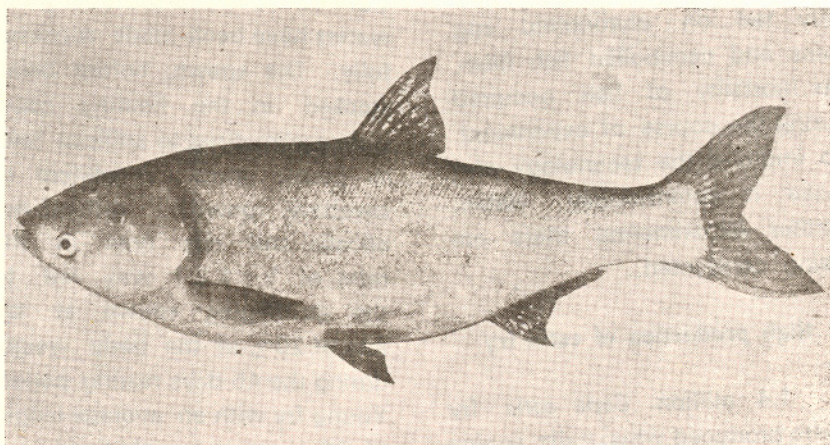
and tanks in the country produce about 0.7 million tons of fish yearly. If the yield could be raised to 1,500 kg/ha/yr, fresh water fish production would rise by 1.7 million tons, thus adding Rs. 6,800 million to the [ See page 2 ]

### RESEARCH HIGHLIGHTS

#### Role of silver carp in development of reservoir fisheries

An experimental consignment of 2,680 fingerlings of exotic silver carp (*Hypophthalmichthys*

a higher net growth of 4.7 kg in 27 months. These observations not only indicate the potential



Silver carp (*Hypophthalmichthys molitrix*)

*molitrix*) was introduced in the Getalsud reservoir in March, 1974. A number of recoveries have since been made and it is remarkable that fish registered a net growth of 4.3 kg in just 2 years and 4 months. One of the recoveries showed even

role of silver carp both in Getalsud and other reservoirs of similar eco-morphological features but also suggest the paramount need of stocking such reservoirs with a phytoplankton feeding species like silver carp (*Hypophthalmichthys molitrix*).

### Mass culture of zooplankter *Moina dubia* as a fish food organism

Mass culture of plankter *Moina dubia* has been successfully achieved in plastic pools by utilising freshly cultured phytoplankter *Scenedesmus obliquus* as feed in yard trials. The alga

### Catfish culture in running water

The hatchlings of the catfish *Mystus seenghala*, commonly known as 'Tengra' were cultured in nylon cages in running waters and attained an average size of 139 mm in 144 days of rearing. In nature, there is distinct parental care exhibited in this species and the hatchlings (av. size 15 mm) are known to feed on a whitish scum oozing from the body of the male parent guarding the nest. The significant feature of the experiment was that in captivity, the developing hatchlings could be successfully fed on chironomid egg mass and semiboiled fish flesh. No mortality of fish occurred during the course of experiment. To improve the technology and make it commercially viable, further experimental trials are being conducted.

### High production of catla fry

1.4 million *Catla catla* fry were produced when catla spawn was stocked at the rate of 2.8 million/ha. This high numerical yield (50% of the stocked spawn) was possible owing to the inclusion of the micro nutrient cobalt chloride in the feed mixture of ground-nut oilcake and rice polish. The nursery pond was also manured daily with cow dung at the rate of 25 kg/ha.

was introduced in suspension as food for *Moina dubia* at the rate of 0.250 ml per individual per day. The density of *Moina dubia* could be increased to 10,000 organisms per litre from an initial inoculum of 10 organisms/l within a culture period of eight days, leading to possibilities of its large scale production in field conditions. *Moina* constitutes a major natural food item of carps in polyculture.

### Carp spawn rearing in floating cages in lentic environment

Fish spawn is usually reared in specially prepared nursery ponds where mortality of the developing spawn often occurs due to the accumulation of metabolites in the pond. Recently, experimental trials of rearing carp spawn in floating nylon cages (2.5 × 2 × 2 m) released in pond waters have been made successfully. The spawn, before being stocked in the floating cage, were acclimatised to artificial feed in plastic pools. A mixture of soyabean powder, ground-nut oilcake and rice bran in the ratio of 1 : 1 : 1 was fed to the developing spawn at the rate of 20% of the body weight during the 45 days rearing period. Young fry with an average length of 59.4 mm were obtained towards the close of the experiment and their retrieval was easier.

### INLAND AQUACULTURE AND FINANCING

The Senior Extension Officer delivered a talk on "Induced breeding and composite fish culture and their economics" to the Field Officers of the State Bank of India, Calcutta at the

[ Continued from page 1 ]

gross national product at the present low price of Rs. 4000/- a ton.

### Control of submerged vegetations

As a long term control measure of rooted submerged weeds, viz., *Ottelia* sp., *Vallisneria* sp., etc. a technique, suitable for rural conditions obtaining in India, has been evolved. Dry brick pellets soaked in aqueous solution of 2,4-D sodium salt formulation were broadcast judiciously amongst clusters of weed infestations in ponds. Prolonged clearance of chronic infestations of *Nelumbo* sp., *Nymphoides* sp., *Ottelia* sp., *Vallisneria* sp., etc. in perennial ponds has been achieved when 2 to 4 instalments of 2,4-D @ 10 kg/ha in each instalment have been applied in the above stated manner. Phytotoxicity, as tested by growth of sensitive land plants, was not detectable in soil and water samples, 4 weeks after the application of each dose.

### EXTENSION ACTIVITIES

#### Contribution to "Pituitary Bank"

Establishment of a "Pituitary Bank" at international level is in progress at FAO of the United Nations. Initially CIFRI has contributed 2,000 pituitary glands of Indian major carps for the same during 1976.

refresher's course of "Agricultural Finance" on December 12, 1976. Films on "Induced breeding" and "Composite Fish Culture" were also screened for the benefit of the participants.

## DEMONSTRATION OF MAKHANA-CUM-FISH CULTURE

Cultivation of makhana (*Euryale ferox*) is hitherto done in shallow waters in North Bihar. Besides cultivating makhana, the cultivators, with a view to deriving extra benefit, stock those waters with fry of rohu, catla and mrigal which ultimately pays no dividend. To demonstrate the feasibility of exploiting makhana ponds for culturing air-breathing fishes like singhi, magur and koi which not only by nature flourish under such adverse ecosystem but are also highly valued for their nutritional and therapeutic qualities, an experiment was taken up by the Darbhanga Research Centre of the All India Coordinated Research Project on Air-breathing Fish Culture in a 0.04 ha pond in Gunsar Experimental Fish Farm, Darbhanga in Bihar. While the pond was stocked with singhi, magur and koi (av. wt. 9, 10 and 12 g respectively) at the rate of 1 lakh/ha in the ratio of 7.3 : 2.4 : 0.3 in February, 1976, 55 seedlings of makhana were planted in the month of April, 1976. Fish stock was fed with 'choora' husk. The gross and net productions of fish obtained after completely dewatering the pond, were 2,250 and 1,200 kg/ha/10½ months respectively with a survival rate of 61.0, 52.4 and 33.0% in respect of singhi, magur and koi. The produce was handed over to the Bihar State Fisheries Department for sale to the local people.

On the basis of formal collection of makhana (*E. ferox*) the cultivators, witnessing the

harvesting, estimated the final crop to be of a higher magnitude as against the average, usually

produced by them. The harvesting was witnessed by the elite of the town including the Collector, Darbhanga.



Makhana-Cum-Fish Culture Pond

## CIFRI STALL AT "SONPUR MELA"

The Darbhanga Research Centre of All India Coordinated Research Project on Air-breathing Fish Culture set up a demonstration stall at "Sonepur Mela" in collaboration with the State Fisheries Department. The exhi-

bits, posters and charts displayed at the stall drew the attention of a large crowd. The culture techniques of air-breathing fishes were demonstrated to the fish farmers attending the Mela at Sonepur.

## WORKSHOP ON BRACKISHWATER FISH FARMING

The Second Workshop of the All India Coordinated Research Project on Brackishwater Fish Farming was held at Madras from January 31 to February 1, 1977. Dr. V. G. Jhingran, Director, CIFRI, welcoming the delegates explained the potentialities that exist in the field of brackishwater fish farming. He emphasised that the area available for brackishwater fish farming is about 2 million hectares and is more than what is available

for freshwater fisheries in the country. He also expressed that less inputs like fertilizers and artificial feeds are needed in brackishwater fish farming and a better production of a variety of exportable fishes can be obtained. Inaugurating the workshop, Shri P. K. Dave, Adviser to the Governor of Tamil Nadu, observed that there is ample scope for accelerating the pace of development of inland fisheries in India. He pointed out

that the State of Tamil Nadu has yet to become self sustaining in fish seed. Shri Dave stressed the importance of brackishwater fishery as an export-oriented venture and suggested that along with co-operative and private agencies the State Corporation should also enter the field. He also emphasised the need of providing fish to rural population at a reasonable cost. Delegates from various State Fisheries Departments, Universities, Colleges and a number of fishery industrialists participated in the workshop. At the Adyar Fish Farm, demonstrations of prawn and fish production under mono- and polyculture operations were made by the Tamil Nadu Fisheries Department under the project.

## STAFF NEWS

Shri S. K. Wishard, Scientist S-1 has been transferred from Bhagalpur Research Centre to the Riverine and Lacustrine Fisheries Division, Allahabad.

Shri A. K. Das has been appointed as Superintendent (Accounts) at the Trainer's Training Centre, Dhauli, Orissa.

Shri A. N. Ghosh, Scientist S-2 has been deputed to join as Project Director, State Fisheries Development Corporation, Government of West Bengal, for a period of three years. He has taken up his new assignment on 1st March, 1977.

## CONSTRUCTION WORKS AT DHAULI FISH FARM COMPLEX

Administrative approval and expenditure sanctions have been obtained from the ICAR, for the following construction works which have been entrusted with the CPWD :

Construction of 94 residential quarters	Rs. 40.01 lakh
Development of land and bulk services	Rs. 33.25 lakh
Construction of Trainer's Hostel	Rs. 7.47 lakh

Besides, renovation of ponds at a cost of Rs. 98,900/-, construction and renovation of buildings of the Trainer's Training Centre at a cost of Rs. 83,943/- have been done by the State PWD.

## OBITUARY

The members of the staff of the CIFRI express their deep sense of sorrow at the untimely passing away of Shri G. B. Sethi (44 years), Laboratory Boy of the Cuttack Research Centre, who expired on February 10, 1977 and

Shri A. K. Sarkar (41 years), Fieldman of the Barrackpore Estuarine Fisheries Research Centre, who breathed his last on February 23, 1977 after a brief spell of illness.

May God grant peace to the departed souls.

## LIBRARY

### RECENT PUBLICATIONS OF CIFRI

Report on the international conference on Prawn Farming, Vung Taul, South Viet-Nam, 31st March - 3rd April, 1975 by K. Raman. *Misc. Contr. Cent. Inland Fish. Res. Inst., Barrackpore*, (12) : 19 p (Mimeo.)

Report on fish culture prospects in the Collair lake by G. N. Saha & N. G. S. Rao. *Survey Report, Cent. Inland Fish. Res. Inst. Barrackpore*, (6) : 5 p (Mimeo.)

List of publications of the Central Inland Fisheries Research

Institute, 1948-1976 by Anjali De. *Bull. Cent. Inland Fish. Res. Inst. Barrackpore*, (22) : 102 p (Mimeo.)

First 138 case studies of composite fish culture in India. *Bull. Cent. Inland Fish. Res. Inst. Barrackpore*, (23) (Mimeo.)

Report on Dal lake, Srinagar, Kashmir with suggestions for development of its fishery. *Bull. Cent. Inland Fish. Res. Inst. Barrackpore* (24) : 13 p (Mimeo.)

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