CIFRI newsletter

ICAR

Volume 2 September 1977 Number 1

RESEARCH HIGHLIGHTS

OPERATIONAL RESEARCH PROJECT ON COMPOSITE FISH CULTURE

The first meeting of the Implementation Committee of the Operational Research Project on Composite Fish Culture was held at Krishnanagar, Nadia (West Bengal) on September 2, 1977. The meeting was attended by seven members and four special invitees. Netting demonstrations and discussions were arranged on this occasion in which about hundred local fish farmers also participated.

This project has proved and demonstrated beyond doubt high production potential of large water bodies of the water spread area of about 2 ha through composite fish culture and the economic viability of the technology in the two sets of experiments conducted during the years 1973-74 and 1975-76. Fish yields ranging from 2,654 to 4,290 kg/ha/yr and 3,552 to 4,080 kg/ha/18 months were obtained from three ponds with a water spread area of 1.48, 1.93 and 2.15 ha against the earlier average production of 462 kg/ha/yr from the same ponds. The cost of production of fish during the above two sets of experiments was Rs. 2.94 and Rs. 3.06 per kg respectively.

The third set of experiments has been formulated with an idea of integrated approach of fish culture along with compatible combination of horticulture, agriculture, poultry, piggery, duckery, etc., involving the principles of nutrient utilisation by recycling of wastes. The investigations initiated on these lines in December 1976 are in progress.

Netting demonstrations at duck-cum-fish culture pond at Anjana Fish Farm, pig-cum-fish culture pond at Don Bosco Agriculture Centre and a private farmer's pond at Arang Sarisa, were arranged for the members and invitees of the Implementation Committee and the local fish farmers. The members and the farmers present during the

Fishing operation in a duck-cum-fish culture pond at Anjana Fish Farm Krishnanagar.

demonstrations were highly impressed by the excellent results obtained through integration of of duckery, poultry and piggery with composite fish culture. The progress so far made in integrating animal husbandry with composite fish culture is very encouraging.

Pig-cum-fish culture results are outstanding as both the fish and pigs have shown excellent growth in this experiment. Silver carp, grass carp, catla, rohu and mrigal have recorded weights of 1.7, 1.3, 1.2, 0.7 and 0.6 kg from their initial average weights (when stocked in February & March 1977) of 9, 5, 48, 28 and 23 g respectively. Another interesting and notable feature of the experiment is the feeding of grass carp purely on cattle fodder such as *barseam* and hybrid napier grass. No aquatic vegetation was used for feeding the grass carp. The pigs have attained an average weight of 80 kg from their initial av. weight of 22.5 kg on January 30, 1977.

It is hoped that the final results will give a great boost to the idea of rural development through integration of fish culture and animal husbandry and will open a new avenue for rural employment.

The fish harvested from the Oprational Research Project ponds from an area of 5.5 ha only have been sold at low prices fixed by the State Government. As an immediate impact of this, the fish prices in local markets of the whole area showed a steep fall. It can be easily visualised that if this high yielding technology is adopted in all the available water areas of West Bengal, it can go a long way in meeting the fish shortage and lowering the fish prices

Visitors being taken round the pigsties of the pig-cum-fish culture centre at Don Bosco Agriculture Centre, Krishnanagar.

CULTURE OF FISH FOOD ORGANISMS

Mass culture of Artemia sp.— a basic diet for prawn larvae : Brine shrimp, *Artemia* sp., a prime requirement for successful prawn culture operations, involves considerable inconvenience and expenditure towards the import of the sun dried eggs of the species. With a view to deracinating the constraint and sustained culture of the species, laboratory and yard experiments have been in progress at this Institute. During initial experiments, in the laboratory, both the reproductive phases; *i. e.*, viviparous and oviparous, were noticed in the life history of the same individual of *Artemia* sp. Each female bred 4-5 times in batches producing 500 nauplii in a span of 15 days. The optimum salinity and temperature of the ambient water for successful hatching of *Artemia* eggs were found to be 45 ppt and 26° ± 2°C respectively. Eggs collected from subsequent reproduction were sun dried and preserved for future use. Test on the viability of these sun dried eggs showed highly promising results thereby pin pointing the tremendous possibilities of attaining self sufficiency in the procurement of *Artemia* eggs, without involving any foreign exchange.

Mass culture of the phytoplankter Pinnularia gibba : *Pinnularia gibba*, a freshwater diatom, has been successfully cultured in

laboratory and yard trials at the Barrackpore Estuarine Section of the Institute. The technique employed, included the use of urea, single superphosphate and sodium silicate in the ratio of 100 : 10 : 5 as nutrients in the ambient medium @ 385 ppm. Pure culture of *Pinnularia gibba* maintained on agar plates and slants in the laboratory was used to inoculate the nutrient medium @ 48,524 cells/ml which resulted in a cell density of 1.3 million/ml within a period of 10 days. *Pinnularia gibba* is one of the major natural food items of carps in polyculture.

DOMESTIC SEWAGE— AN AID IN FISH CULTURE

In view of the present day shortage of conventional fertilisers generally used in fish culture operations, attainment of high fish yields through maximum utilisation of available nutritive ingredients of waste waters is a step forward towards the rapid development of inland aquaculture. This has been made feasible by the investigations being conducted by the Institute at Rahara, West Bengal on the exploitation of sewage-fed ponds as a lucrative source of pisciculture.

In a recent trial, a noteworthy production of 7,200 kg/ha/yr could be achieved from a 0.17 ha sewage-fed pond by adopting five species culture of Indian and exotic carps. While the pond was stocked with fingerlings of catla, rohu and mrigal in July 1976, exotic carps (common carp and silver carp) were introduced in August and September 1976 respectively. A high stocking density of 15,000 fingerlings/ha in the ratio of 1.0 : 2.5 : 2.5 : 2.0 : 2.0 : in the order of the species mentioned above was adopted. No management measure was employed except for pre-stocking fertilisation of the pond with 6,80,000 litres of primarily treated domestic sewage drained from the Titagarh Sewage Treatment Plant and post-stocking fertilisation with 25,85,000 litres of sewage effluent at periodic intervals.

This achievement not only highlights the important role of domestic sewage in enhancing per hectare fish production but also leads to the possibilities of minimising the cost of fish culture operations in doing away with the conventional fertilizers where such facilities are available.

CANAL BREEDING— A NEW TECHNIQUE FOR CARP SEED PRODUCTION

The major carps generally breed in running waters in rivers during monsoon months. Their breeding in captivity in ponds has been made feasible by hypophysation technique. The dry and wet bundhs are also known as good sources for carp seed production, particularly in the States of West Bengal and Madhya Pradesh. For bundh breeding the velocity of water current required is largely dependant on the gradient of the inlet, the topography and expanse of the catchment area and also on incidence of rainfall.

Recently, spawning of the Indian major carp was successfully attained for the first time by the Riverine and Lacustrine Fisheries Division of the Institute in the plains in a shallow depression, by flooding it from an irrigation canal. The canal water was rushed by gravity. This has led to establishing a new technique being termed as *"Canal breeding technique"*.

A shallow grassy depression (about 4-5 m wide) by the side of a distributary of Balan canal near Basehra (75 km from Allahabad) was selected for the purpose. The depression between the natural bundh of the canal and the field was converted into a rectangular pool by erecting suitable bundhs on the other two sides across the length. The main flow of the canal water was diverted through this chamber having sieves guarding the inlet and the outlet of the same. The depth of water in the pool was maintained at 30 to 120 cm.

In the evening of July 30, 1977 at about 18.00 hr, two sets of *Cirrhinus mrigala* ($2♀+4♂$) and one set of *Ctenopharyngodon idella* ($1♀+2♂$) were introduced into the chan ber. It was a rainy day and the pool water temperature was 26°C. Only one set of mrigal bred while partial spawning of grass carp was noticed within an hour of their release into the breeding pool.

"Canal breeding technique" opens up a new avenue for boosting quality fish seed production in the country with a vast net work of irrigation canals.

Lectures on Status and Scope of Agriculture to the ARS Probationers

Dr. V. R. P. Sinha, Project Co-ordinator, Composite Fish Culture and Fish Seed Production delivered a series of informative lectures to the ARS Probationers at the Central Staff College for Agriculture (ICAR), Hyderabad on Angust 23, 1977. The topics of his lectures were "ICAR Research Support on Fisheries Development in India", "Status, Scope and Planning of Aquaculture in India" and "Management of Aquaculture Research and Training Centre".

A.I.R. HIGHLIGHTS CIFRI's ACTIVITIES

The Calcutta Station of the All India Radio included in its programme 'Vigyan Bichitra' of August 18, 1977, a series of talks delivered by the Scientists of this Institute. While Shri P. Das, Scientist Extension highlighted the role of CIFRI in the rapid development of the inland freshwater aquaculture, Shri K. K. Ghosh, Scientist S-1, focussed the noteworthy achievements of the Institute in the field of brackishwater fish and prawn farming. 'Diseases in fish and their control' was the other aspect covered by Shri Ajoy Kumar Ghosh, Scientist S-1.

To generate interest among the children in the aquatic wealth of the country with particular reference to fish, a talk on 'Local Aquatics' summarised by Shri P. Das, Scientist Extension, was boardcast by the All India Radio, Calcutta in their English Programme 'Calling All Children' on August 28, 1977.

L I B R A R Y

The undermentioned important books were added to the Central Library of the Institute :-

Blassius, W.
Problems of life research : Physiological analyses and phenomenological interpretations.

Golterman, H. L.
Physiological limnology · an approach to the physiol gy of lake ecosystems (Oevelopments in Water Science, 2).

Hendricks, Charles W. & Ors.
Fresh water pollution I : bacteriological and chemical pollutants (A volume in the MSS topics in ecology series).

Palmar, John D.
Biological clocks in marine organisms : the control of physiological and behavioral tidal rhythms.

Ribelin, William E. & George Migaki *eds.*
The pathology of fishes.

Shepherd, Geoffrey S.
Agricultural price analysis. 5th ed. rev. print.

Inland Aquaculture & Bank Officials Training

Shri P. Das, Scientiest Extension delivered a lecture on 'Modern techniques of fish farming' to the participants of the Orientation Training Course for the Development Officers of the United Commercial Bank at Calcutta on August 18, 1977.

Workshop on Reservoir Fisheries

The Fifth Workshop of the All India Coordinated Research Project on Ecology and Fisheries of Freshwater Reservoirs was held at Ukai, Gujarat on September 7 and 8, 1977. Welcoming the participants at the workshop, Dr. R. Raghu Prasad, Assistant Director General (Fisheries) stressed the need of reservoir fisheries research in the country. He also appraised the participants about the contribution of the ICAR and that of the participating States in the joint research programmes on reservoir fisheries.

The first two sessions of the workshop were chaired by Shri K. V. Navate, Deputy Commissioner of Fisheries, Gujarat and the third; *i.e.*, the finalisation of technical programme was presided by Dr. V. G. Jhingran, Director, Central Inland Fisheries Research Institute, Barrackpore.

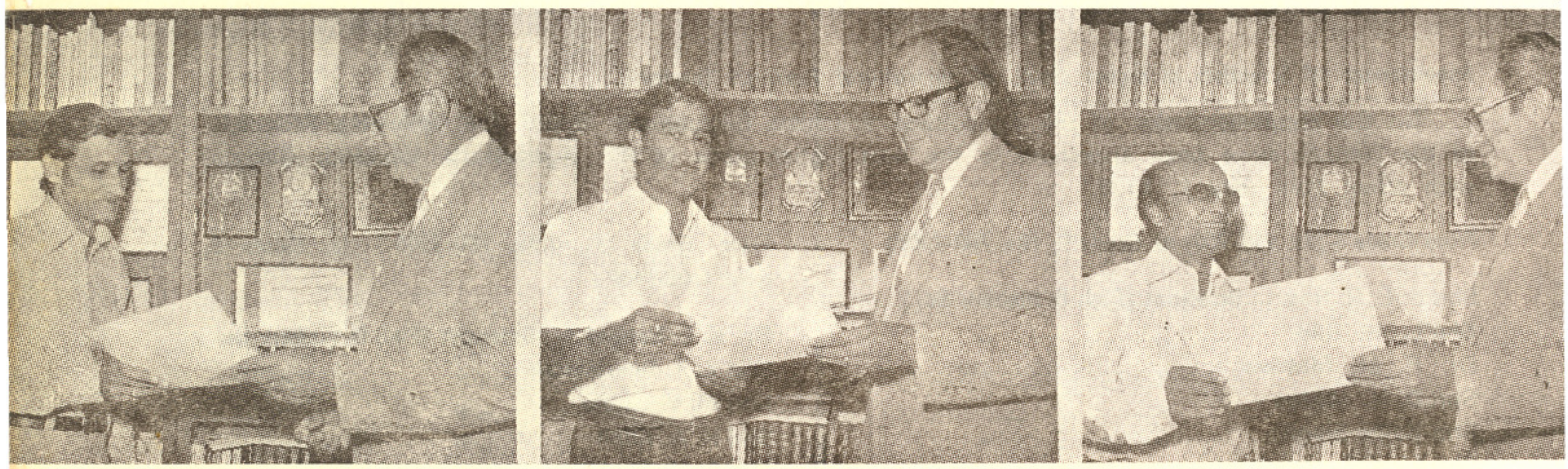
RECENT PUBLICATION OF CIFRI

A revised note on the methodology for culture of *Penaeus monodon* (*Misc. Contribution* No. 13, July 1977 : 10 p).

STAFF NEWS

CIFRI Scientists Complete Aquaculture Training in USA

Sarvashri R. D. Chakrabarty (Scientist S-2), S. D. Tripathi (Scientist S-2) and R. M. Bhowmick (Junior Fishery Scientist) of the Central Inland Fisheries Research Institute successfully completed a 5-month aquaculture training course offered by Auburn University, Alabama, USA. The training programme included lectures, laboratory & field work, special projects and supervised travel. The above scientists visited several aquacultural centres in the United States, such as fish hatcheries, fish feed mills, fish processing plants, shrimp culture facilities and extension agencies. On August 22, 1977, Dr. R. Dennis, Dean & Director of Auburn University, School of Agriculture presented each scientist with the training certificate to signify the successful completion of the programme. All the scientists of the CIFRI were uniformly rated excellent in their class work and very good in their special projects. Funds for the foreign travel of the scientists came from CIFRI/IDRC Project for which the Institute is grateful to the IDRC, Canada.



Sarvashri R. D. Chakrabarty, S. D, Tripathi and R. M. Bhowmick. Scientists of the Institute receiving certificates from Dr. R. Dennis, Dean and Diractor, School of Agriculture, Auburn University, Alabama, U. S. A.

IDRC Fellowship For CIFRI Scientists

Dr. P. V. Dehadrai, Scientist S-3 of the Institute has left India on September 1, 1977 for Singapore, Djakarta, Manila and Bangkok for $1\frac{1}{2}$ months' training in aquaculture under the International Development Research Centre (Canada) Fellowship Programme.

Shri M. A. V. Lakshmanan, Junior Fishery Scientist of the CIFRI who left the country on June 22, 1977 for a similar assignment to Singapore, Indonesia, Thailand and Philippines, has returned on August 9, 1977 after successful completion of his training.

TRANSFERS :

The undermentioned transfers were made during July to September, 1977

Name & Designation	*From*	*To*
Shri N. K. Thakur, Scientist S-1	Darbhanga	Patna
Shri Kohli M. P. Singh, Scientist -S	Darbhanga	Patna
Dr. B. P. Gupta, Scientist -S	Bhavanisagar	Ranchi
Shri K. L. Shah, Scientist S-1	Allahabad	Bhagalpur
Dr. M. L. Bhowmick, Scientist S-1	Malda	Jalpaiguri
Shri N. P. Singh, Laboratory & Field Assistant	Buxar	Allahabad

APPOINTMENTS :

The following persons were appointed during the period July to September 1977 :

Name & Designation	*Place of Posting*
Shri Kuldip Kumar, Demonstrator	Dhauli/Bhubaneswar
Shri Nirmal Chandra Burman, Fisherman	Rahara
Shri Phani Gharami, Fisherman	Kakdwip

LEAVE PREPARATORY TO RETIREMENT

Shri M. K. Sarkar, Accounts Officer of the Institute, has proceeded on leave preparatory to retirement with effect from August 3, 1977.

Appointment of Scientists to higher grade of Agricultural Research Service :

On the recommendation of the Agricultural Scientists Recruitment Board, the following Scientists of the Institute have been appointed to the next higher grade of the Agricultural Research Service with effect from July 1, 1976.

From Grade S (Rs. 550-900) to Grade S_1 (Rs. 700-1300)

Shri P. L. N. Rao,	Scientist	(Fish & Fishery Sci.)
Shri L. H. Rao	,,	,,
Dr. P. M. Mathew	,,	,,
Shri D. N. Mishra	,,	,,
Shri Balbir Singh	,,	,,
Shri M. Kaliyamurthy	,,	,,
Shri C. B. Joshi	,,	,,
Shri Shyam Sundar	,,	,,
Shri S. D. Gupta	,,	,,
Shri R. K. Saxena	,,	,,
Shri S. Srinivasagam	,,	,,
Shri K. J. Rao	,,	,,
Shri C. P. Rangaswamy	,,	,,
Shri Kuldip Kumar	,,	,,
Shri B. L. Pandey	,,	,,
Shri M. A. Khan	,,	,,

From Grade S_2 (Rs. 1100-1600) to Grade S_3 (Rs. 1500-2000)

Shri B. B. Pakrasi	Scientist	(Fish & Fishery Sci.)

From Grade S_1^1 (Rs. 700-1300) to Grade S_2 (Rs. 1100-1600)

Dr. K. L. Sehgal	Scientist	(Fish & Fishery Sci.)
Shri K. K. Sukumaran	,,	,,
Shri M. V. Gupta	,,	,,
Shri H. A. Khan	,,	,,
Shri B. N. Saigal	,,	,,
Shri A. Ghosh	,,	,,
Dr. S. P. Ayyar	,,	,,
Shri R. N. Pal	,,	,,
Shri B. V. Govind	,,	,,
Shri P. R. Sen	,,	,,
Shri N. G. S. Rao	,,	,,
Dr. M. Subrahmanyam	,,	,,
Shri K. H. Ibrahim	,,	,,
Dr. Y. Rama Rao	,,	,,
Shri Ravish Chandra	,,	,,
Shri B. K. Sharma	,,	,,
Shri D. V. Pahwa	,,	,,
Shri K. K. Ghosh	,,	(Agril. Stat.)
Dr. K. Alagaraja	,,	,,

GRANT OF ADVANCE INCREMENTS

The undermentioned scientists of the Institute have been granted advance increments as mentioned against their names

Shri G. N. Srivastava	Scientist	(Fish & Fishery Sci.)	S (Rs. 550-900)	Three	Increments
Shri Shree Prakash	,,	,,	S (Rs. 550-900)	Three	,,
Shri R. N. Seth	,,	,,	S (Rs. 550-900)	Three	,,
Shri P. N. Jaitly	,,	,,	S (Rs. 550-900)	Two	,,
Shri M. K. Mukhopadyay	,,	,,	S (Rs. 550-900)	Two	,,
Shri P. M. Mitra	,,	(Agril. Stat.)	S (Rs. 550-900)	Two	,,
Shri A. Sengupta	,,	(Agri. St. & Process Engg.)	S-1 (Rs. 700-1300)	Two	,,
Shri M. Ranadhir	,,	(Agri. Eco.)	S-1 (Rs. 700-1300)	Two	,,
Shri Ch. G. Krishnayya	,,	(Fish & Fishery Science)	S-1 (Rs. 700-1300)	Three	,,
Dr. G. N. Mukherjee	,,	,,	S-1 (Rs. 700-1300)	Two	,,

NEW POSTING OF ARS SCIENTISTS

The following Scientists, Grade S-1 of the Institute were posted at places shown against their names during the period August to September 1977.

Name	*Place of posting*	*Name*	*Place of posting*
Shri Kuldip Kumar	Barrackpore	Shri S. K. Munnet	Patna
Shri L. H. Rao	Bangalore	Smt. S. Sivakami	Bhavanisagar
Shri A. Mukherjee	Ranchi	Shri V. R. Chitransi	Buxar
Shri Y. S. Yadav	Gauhati	Km. Usha Bali	Srinagar
Shri S. N. Mohanty	Bhubaneswar	Dr. Babu Lal	Calcutta
Shri S. R. Das	Krishnanagar	Shri A. Sen	Barrackpore
Shri Manas Kumar Das	Krishnanagar	Smt. M. Sultana	Madras
Shri K. J. Rao	Tadepalligudem	Shri U. Bhowmick	Barrackpore
Shri Hardyal Singh	Calcutta	Smt. K. K. Bhanot	Barrackpore
Dr. K. Janki Ram	Kakinada	Shri P. K. Arabindakshan	Bhavanisagar
Shri R. Paul Raj	Bhubaneswar	Shri A. K. Laal	Kalyani
Shri R. C. Das	Cuttack	Shri J. Chandra	Karnal
Shri A. K. Sahu	Cuttack	Shri B. C. Tayagi	Jaunpur
Shri P. Ravi Chandran	Kakdwip	Dr. P. M. Mathew	Pune
Shri S. M. Pillai	Kakdwip		

Edited & compiled by B. N.Saigal & P. K. Chakrabarti

Published by the Director, Central Inland Fisheries Research Institute, Barrackpore-743101 (W. B.)

and Printed at usha a house for printing, Abakash, port blair lines, Barrackpore