CIFRI newsletter

ICAR

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RESEARCH NEWS

GROWING MORE FISH WITH PADDY

In several countries in South-east Asia; *viz.*, Phillipines Indonesia, Japan, Thailand, etc., paddy plots are extensively used to raise fish as second crop during paddy cultivations. Though in India, seasonal utilisation of paddy fields for culture of brackishwater prawns and fishes, which naturally enter into the fields in the course of high tides, is an age old system, particularly in the States of West Bengal and Kerala, fish culture in paddy plots by deliberate stocking of desirable fast growing species (catla, rohu, mrigal, murrels and tilapia) is being experimented upon since recent past. From Karnataka, average production of 112 kg/ha of *Ophicephalus striatus* was reported besides a simultaneous increase (7-13%) in the paddy production. Breeding of *Clarias batrachus* in paddy field for production of advanced fry has been demonstrated without disturbing the the traditional paddy cultivation operation. Realising the vast scope available for augmentation of fish production by systematic utilisation of paddy plots, experiments have recenty been initiated by CIFRI at its two Research Centres, one each in the States of West Bengal and Orissa, to establish a system of paddy-cum-fish culture which is likely to yield better returns to the agriculturists.

Paddy-cum-fish culture at Rahara Research Centre, West Bengal

An experiment on paddy-cum-fish culture was initiated at the Rahara fish farm of the Institute in the year 1977. Waterway for fish culture was of the shape of trapezoidal canal which ran all along the perimeter of the agricultural field. The top and bottom width of the canal, excavated for the purpose, was 6 m and 3.6 m respectively and its average depth was 1.2 m. The excavated earth from the canal was utilised for building the surrounding dykes for protecting

Paddy fields— a source of profitable fish culture for agriculturists. A scene from simultaneous harvesting of paddy and fish in progress at Rahara Research Centre (Khardah), West Bengal.

the fish stock and paddy field from getting flooded during the monsoon months.

A deep water pest resistant hybrid paddy ('JALADHI-II') was sown and the Indian major carps (catla, rohu and mrigal) were stocked @ 6,000 fingerlings/ha in the ratio C 4: R 3.5 : M 2.5. The 'Jaladhi' crop was harvested in December, 1977 and about 1,880 kg/ha of paddy was produced without any application of fertiliser and pesticides. This was followed by cultivation of another high yielding variety of paddy. "Jaya" seedling, grown in a specially prepared nursery bed, was transplanted to the main plot in February, 1977. Fertilisation of the paddy plot was done in two instalments in this case, one soon after the transplanted seedlings had taken root, and the other in flowering stage. During "Jaya" cultivation pesticide operations were also continued. Harvesting of "Jaya" paddy was made in the first week of June and an estimated production of 4,613 kg/ha was achieved. After completion of paddy harvesting the paddy plot was allowed to dry up and the fishes took shelter in the perimeter canal. In this culture system, the fish and the paddy had grown together for a period of 5 months since stocking in July, 1977. To accelerate the fish growth within the limited rearing period in paddy field external managements such as supplementary feeding with mustard oilcake and rice bran (1 : 1) was resorted to @ 2—4% of the body weight of the stocked fishes. The fishes were reared for the full year in this system of culture (5 months in the paddy plot and rest 7 months in the perimeter canal). The total fish harvested was 708.65 kg and the calculatd gross production as per perimeter canal area (0.27 ha) was 2,624 kg/ha/annum ; but when the entire area of the culture system (1.02 ha) was considered for estimation, the production achieved was about 700 kg/ha/annum.

Fingerling raising alongwith paddy cultivation at Cuttack Research Centre, Cuttack (Orissa)

With the advent of various high yielding and economically viable scientific fish culture technologies, intensive fish farming is fastly gaining popularity among rural entreprenuers resulting in high demand of quality fish seed. Insufficient space available for ground nurseries stands as a major impedement for optimising fingerling production even when techniques for raising fish seed under stocking densities as high as 10 million/ha exist. As such, to explore the possibilities of raising fingerlings from paddy plots, experiments have since 1975 been initiated at the Cuttack Research Centre of the CIFRI in collaboration with the Central Rice Research Institute (CRRI) at Cuttack (Orissa). The preliminary experiments in 1975, indicated practicability of growing fingerlings of common carp, rohu and mrigal in paddy plots under the agro-climatic conditions of Orissa. In 1976, experiments on elaborated scale were conducted in two paddy plots at CRRI. CR 1014 variety of paddy was sown in the plots and exotic common carp (*Cyprinus carpio*) was stocked in each plot @ 7,250 nos./ha. The average growth exhibited by the fish after 119 days of rearing was highly promising (131.0 mm/75.3 g and 126.5 mm/68.1 g) besides, the estimated net fish yield of 85.2 and 72.0 kg/ha. Yield of paddy from the two plots was 2,800 and 2,638 kg/ha showing no adverse effect on the producton due to fish stocking. Though the plots were fertilised with organic and inorganic fertilisers, no supplementary feeding was resorted to for the fish.

With the gradual modification of the technique, the results obtained in the follow up experiments at Dhauli (Orissa) have further strengthened the soundness of fingerling raising in course of paddy cultvation. At Dhauli Fish Farm of the CIFRI, common carp was stocked in a plot (@ 12,000 nos/ha) where a hybrid paddy—CHINA 1039 variety — was sown. The survival of fingerlings at the end of 99 days rearing was worth reporting (88%) and comparable to that achieved in nursery ponds. The resultant estimated net fish production was 127.6 kg/ha.

[See page 3 Col. 1]

INTEGRATION OF AQUACULTURE AND LIVE STOCK

The Operational Research Project on Composite fish culture has since its inception in March, 1973 at Krishnanagar, West Bengal proved and demonstrated beyond doubt the high production potential of large sheets of water bodies (1 ha and above) through composite fish culture and the economic viability of the technology in the earlier two sets of experiments conducted during the year 1973-74 and 1975-76.

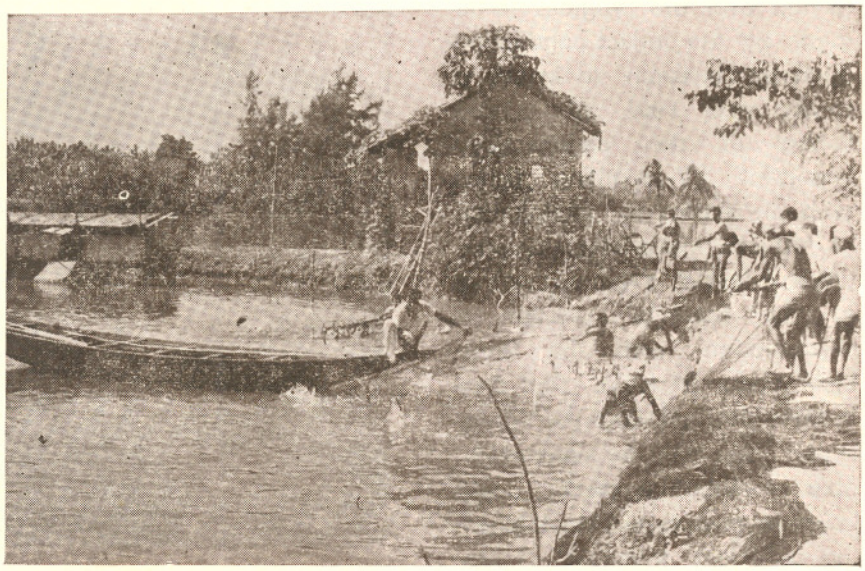
The path-breaking research initiated under the project in the third set of experiments (1976-77) with an accent to integrate fish culture with live stock have unvailed a new horizon of high fish prduction at remarkably low costs. Considerable progress has been achieved in integrating aquaculture with duckery, piggery, and poultry with outstanding results.

In duck-cum-fish culture experiments still in progress in a large sheet of water body (1.48 ha), six species culture of Indian and exotic carps stocked @ 6,000 fingerlings/ha, along-

[Continued from page 2]

The experiments indicated that rearing fishes for reasonable duration in plots growing deep water paddy and at constant water depth of 15—30 cm with provison of supplementary feeding would yield better results. Also the control of insect pests of paddy may be more effective by a larger fish population, manifesting in higher production of paddy, too.

with 100 ducklings (Bengal runner and cross breed of Bengal runner & Khaki Campble) reared simultaneously on floating duck houses (50X3 ft) constructed on the pond, yielded 3,027 kg of fish in a partial harvesting during November, 1977 besides, 850 duck eggs collected as additional output. Management measures adopted included no external fertilisation of the pond or feeding of fish but for the duck droppings which go directly into the pond at an estimated rate of 10 t/100 birds/yr and automatically recycled. Based on the standing crop, another 5,190 kg of fish is estimated from the pond. The ducks have also exhibited notable growth increment.



Netting operation in a duck-cum-fish culture pond of the Operational Research Project, Krishnanagar (West Bengal). A floating duck house in the background.

Results of the experiments on the pig-cum-fish culture are outstanding as both the fish and pigs have shown excellent growth. Under heavy stocking density (8,500 nos/ha) and without the provision of supplementary feeding, silver carp and grass carp have grown to over 2 kg in 10 months from their initial average weights of 9 and 5 g respectively. Catla, rohu, mrigal and common carp have recorded weights of 1.3, 1.0, 0.9 and 0.6 kg respectively from respective initial average weights of 48, 28, 23 and 3 g. Another interesting and notable feature of the experiment is the feeding of the grass carp purely on cattle fodder such as *barseem* and hybrid napier grass. No aquatic vegetation was used for feeding the grass carp. The present estimated per hectare standing crop of the pond is 8,500 kg. The pigs have attained an average weight of 95.4 kg from their initial average weight of 22.5 kg on January, 1977.

It is hoped that the final

[See page 4, Col, 3]

Fish Farming Can Solve Unemployment

— Shri Lilamoy Das

Shri Lilamoy Das, Minister for Fisheries, Government of Assam visited the Air-breathing Fish Culture Project Centre of the CIFRI, located at the State Government Fish Farm at Hajo (Assam), on May 20, 1978. Shri Das expressed high satisfaction over the progress so far made by the project conducting intensive research to install a totally new kind of culture fishery of the commercially important air-breathing fishes with an accent to exploitation of hitherto unexploited derelict weed infested swampy waters of the State of Assam in collaboration with the State Fish Farm at Hajo. Shri Das besides pin pointing the great scope that can be made available to meet the present day's unemployment crisis by establishing sufficient numbers of fish farms thereby augmenting the the fish production as well, hinted at the significant role of the scientists and the State officials working in the project and the farm respectively in popularising the modern techniques of scientific fish farming among the pisciculturists of the State through teaching schemes and field demonstrations. A demonstration of the mixed culture of koi, singhi and magur, in progress, was arranged for Shri Das in the farm. The Minister expressed his satisfaction over the encouraging average growth (200 g) attained by the species in a very short period involving remarkably low input.

Shri M. Ahmed, Director of Fisheries, Government of Assam, accompanying the Minister, highlighted the achievement of production of fish to the tune of 2,100 kg/ha/yr (in 1976-77) in the Hajo Fish Farm through composite fish culture and assured the best coordination of the State in converting the air-breathing fish culture to a totally popularised fish culture system in the State.

[Continued from page 3]

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 vista for rural employment as well.

Shri Lilamoy Das, Minister for Fisheries, Government of Assam, appreciating magur *(Clarias batrachus)* raised at Hajo Fish Farm, Gauhati (Assam) under Air-breathing Fish Culture Project of the CIFRI.

TRAINING AND DEMONSTRATION UNDER THE RURAL AQUACULTURE PROJECT IN JALPAIGURI

The Rural Aquaculture Project is covering a group of three villages within a redius of 10 km at its Jalpaiguri Research Centre for demonstrating scientific techniques of fish culture to the pond-owners. Fish culture, even in the traditional manner, has not been a normal practice with pond owners in Jalpaiguri Dist.ict. 13 ponds (0.1-1.9 ha) convering an area of 5.12 ha being utilised for the purpose of demonstration and training.

Induced breeding of mrigal was taken up at this centre for the first time during the 1977 monsoon season and 2 lakh spawn handed over to the pond owner. Seven lakhs of common carp spawn was produced and handed aver to the Block Development Officer for rearing and distribution of fry to the pond owners in the Sadar Block.

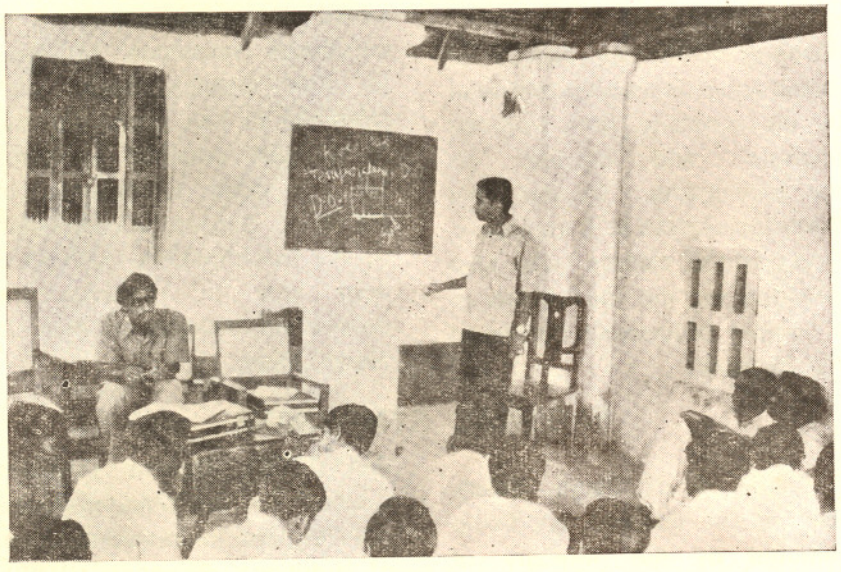
25 persons including pond owners, educated unemployed youth, teachers and farmers underwent a six-day training

programme in fish breeding and culture from March 27-April 1, 1978. Five of these trainees are the members of a Coopera tive Society called "Unemployed Young Men Pisciculture Cooperative Society Limited" which has been organised recently.

Shri Ahmed distributed certificates to the participants who underwent the training programme in April, 1978.

A netting demonstration was also arranged on this occassion at Jordighi and a token catch of 2 quintals of fish was handed over to the pond owners. Those who participated in the programme were greatly impressed to see the growth of catla which had grown over 1kg in six months in Jordighi. Acidic nature of soil and water of fish ponds in Jalpaiguri District are largely responsible for slow rate of growth in fishes in contrast to which the growth of catla has been a remarkable one.

The impact of this project is already being felt in the area and many pond owners are keenly interesed in undertaking scientific fish culture in their ponds. One of the farmers has already started constructing a fish farm for rearing seed of cultivable species, facilities for which are not locally available in the District. The project is also undertaking fish breeding programme at Jalpaiguri during June—July, 1978.



Rural Fish farmers attending a class at Jalpaiguri (North Bengal) under the training and demonstration programme of the CIFRI/IDRC Project.

A 'Farmers' Day' was organised at Jordighi on May 4, 1978. Shri Ahmed S.D.O., Jalpaiguri, was the Chief Guest at the function. Shri Ahmed, in his address, appreciated the work done under the project in Jalpaiguri District and thanked the ICAR for establishing a centre for demonstration of scientific fish culture in Jalpaiguri where fish culture as such did not exist. He was happy to note that a number of participants underwent a training programme and were showing interest in scientific fish farming.

Questions asked by the pond-owners and neo-fish farmers were satisfactorily answered by the staff of the project.

Dr. V. G. Jhingran, Director, CIFRI (Second from left) handing over the fish, raised at the Jalpaiguri (North Bengal) Centre of the IDRC Project, to the pond owner.

ASIATIC SOCIETY MEMBERSHIP

Dr. (Miss) Eva Mitra, Scientist$_2$ was elected as a member of the Council of Asiatic Society for the year 1978-'79 at the annual meeting of the Council held at Calcutta on February 6, 1978.

SUMMER INSTITUTE ON INLAND AQUACULTURE

A Summer Institute on 'INLAND AQUACULTURE', sponsored by the ICAR, was organised by CIFRI, during June 19-July 18, 1978 at Barrackpore. Twentytwo participants from various universities, colleges, State Fisheries Departments and allied institutions/organisations attended the same. Lectures covering multiferious aspects of inland aquaculture were delivered by the scientists, both from the Institute and outside, to the participants. Besides the theoritical classes at Barrackpore, field oriented classes were also arranged for the participants at a number of Research Centres of the Institute.

SHRI CHATTERJEE TAKES OVER CHARGE

Consequent upon the transfer of Shri G. C. Sharma, Administrative Officer to the Jute Technological Research Laboratory (ICAR) Calcutta, Shri S. K. Chatterjee, Assistant Administrative Officer has taken over the charge of the Office of the Administrative Officer on 16.5.1978 as officiating Administrative Officer.

NEW RESEARCH CENTRE ESTABLISHED

A new Research Centre of the CIFRI — MANS RESEARCH UNIT — has been established at Muzaffarpur in North Bihar. Mans Research Unit will conduct investingations aimed at scientific apprisal of nutritional resources of *Mans* in Kosi - Gandak Basin with reference to fish production and to suggest remedial measures for the rapid development of the *Mans*. Successful completion of the investigations will go a long way in restoring the dewindling fisheries of *Mans* in North Bihar.

FAO/EIFAC SYMPOSIUM

Dr. B. N. Singh, Scientist$_1$ of the Institute, on being deputed by the Ministry of Agriculture & Irrigation, Department of Agricultural Research & Education (Government of India), participated in the FAO/EIFAC symposium on 'Finfish Nutrition and Feed Technology' held at Humberg (West Germany) during June 20-27, 1978. The symposium was sponsored by FAO in collaboration with International Council for the Exploration of Sea (ICES), General Fisheries Council for the Mediterraneans (GFCM), and International Union of Nutritional Sciences (IUNS). Dr. Singh, who also actively participated in discussion of papers and recommendation session, presented his own contribution entitled 'Effects of protien quality and temperature on the growth of fingerlings of rohu, *Labeo rohita* (Ham.)'. The paper was highly appreciated by the participating delegates and others present.

STAFF NEWS

AGRICULTURAL RESEARCH SERVICE PROBATIONERS

Sarvashri P. K. Pandit and D. Kumar of this Institute have been selected for the Agricultural Research Service on the basis of the competitive examination of the Agricultural Scientists Recruitment Board (ASRB), New Delhi, for the current year.

Induction of Scientists To Agricultural Research Service

Sarvashri B. C Jha and M. P. S. Kohli, Senior Research Assistants have been inducted to the Agricultural Research Service in the grade of Scientist 'S' (Rs. 550-900) during April, 1978.

WEDDING

Kumari A. Sengupta, Junior Clerk married Shri Kalyan Neogi on 23rd April, 1978.

Dr. Jhingran Represents India In FAO/UNDP Ad-Hoc Consutation

Dr. V. G. Jhingran, Director, Central Inland Fisheries Research Institute, Barrackpore attended, as India's representative, the FAO/UNDP Ad-hoc Consultation on Aid for Aquaculture Development held in La Toja (Pontavedra), Spain (20-30 June, 1978).

PERSONALLIA

Shri Ujjwal Kr. Ghosh, Junior Steno to the Project Co-ordinator, Air-breathing Fish Culture Project, obtained the degree of Bachelor's of Law (LL.B.) of the Calcutta University.

DR. V. G. JHINGRAN VISITS GUYANA

Dr. V. G. Jhingran, Director, CIFRI, was deputed by the Ministry of External Affairs, Government of India, as an Adviser for Aquaculture to the Government of Guyana, South America during 27 June-10 July, 1978. Dr. Jhingran rendered expert's suggestions to the Government of Guyana on verious aspects contributing to the development of freshwater and brackishwater aquaculture of the country with particular emphasis on the utilisation of sugar cane fallow fields of the Guyana Sugar Corporation Ltd.

The Guyanese newspaper "GUYANA CHRONICLE" in its edition of 29th June, 1978 highlighted Dr. Jhingran's visit in detail under the caption 'INDIAN EXPERT HERE TO LOOK AT GuYSUCO FISHERIES PROJECT'.

DR. V. R. P. SINHA IN HUNGARY

Dr. V. R. P. Sinha, Scientist$_3$ of the Institute has been deputed for three months by the ICAR to Hungary on an assignment as FAO Consultant in fisheries to the Government of Hungary. Dr. Sinha left for Hungary on May 1st, 1978.

LIBRARY

The following books were added to the Central Library of the Institute :—

Suffet, I. H *ed.*
Fate of pollutants in the air and water environments Part 2 : chemical and biological fate of pollutants in the environment.

Lockwood, A. P. M.
Effects of pollutants on aquatic organisms

Lehninger, Albert L.
Biochemistry : The molecular basis of cell structure and function.

Rao, K. Ranganatha
Textbook of biochemistry

Gulland, J. A.
Fish population dynamics

Shigueno, Kunihiko
Shrimp culture in Japan

OBITUARY

The members of the staff of the CIFRI express deep sense of sorrow at the untimely passing away of Shri C. R. Halder (36 years), Peon at Headquarters, who expired on 3. 4. 1978, after a brief spell of illness.

May God grant peace to the departed soul.

APPOINTMENTS

The following appointments were made during the period April-June, 1978 :

Name	Post	Place of Posting
Shri J. C. Malhotra, Scientist-2	Scientist-3	Allahabad
Shri R. D. Chakraborty, Scientist-2	Scientist-3	Cuttack
Dr S. B. Singh, Scientist-2	Scientist-3	Cuttack
Dr. A. G. Jhingran, Scientist-2	Scientist-3	Allahabad
Shri S. D. Tripathy, Scientist-2	Scientist-3	Barrackpore
Shri D. D. Halder, Scientist-1	Scientist-3	Kakdwip
Shri M. A. Khan, Scientist-S	Scientist-1	Barrackpore
Shri J. P. Verma	Sr. Training Asstt.	Kausalyagang
Shri R. N. Mahato	Junior Clerk	Barrackpore
Shri R. K. Ghosh	Junior Clerk	Barrackpore
Shri S. K. Tikadar	Junior Clerk	Kakdwip
Shri Balaram Das	Watchman	Cuttack
Shri Debahari Behera	Watchman	Cuttack
Shri K. C. Naik	Watchman	Cuttack

CIFRI RECREATION CLUB HOLDS ANNUAL MEETING

The Annual General meeting of the CIF Recreation Club was held on April 18, 1978. The meeting was presided over by Dr. V. G. Jhingran, President of of the Club. While welcoming the newly elected Executive Body, Dr. Jhingran praised the out-going Executive Committee for their efficient conduct of the activities of the Club during the past year. Smt. K. Jhingran, kindly consented to be the Chicf Guest for the prize distribution ceremoy and gave away the prizes to the winners of different sports and games events for the year 1977-1978. The following were elected as the members of the Executive Committee by the General Body for the year 1978-79. The meeting was concluded with a vote of thanks to the chair.

President	Dr. V. G. Jhingran
Vice-President	Shri K. K. Ghosh
Joint Secretaries	Shri G. Lahiri
	Shri Amitabha Ghosh
Treasurer	Shri S. Dasgupta
Cultural Secretary	Shri Ujjwal Kr. Ghosh
Sub-Committee	Shri A. Sengupta
	Shri B. C. Dutta
	Shri D. C. Bose
Sports Secretary	Shri T. Chatterjee
Sub-Committee	Shri H. Chakladar
	Shri R. K. Chakraborty
	Shri Ajoy Ghosh
Library Secretary	Shri G. B. Das
Sub-Committee	Shri T. K. Mazumdar
	Kumari Namita Choudhury
	Smt. S. Das

CULTURAL WING CELEBRATES RABINDRA JYANTI

The Cultural Wing of the Club celebrated Rabindra Jyanti on May 12, 1978. The highlight of the function was staging of Tagore's one-act drama 'Roger Chikitsa' by the children residing in the campus. The drama was highly appreciated by the audience.

Edited & compiled by Shri B. N.Saigal

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