



# CIFRI NEWSLETTER

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## THE HON'BLE MINISTER FOR AGRICULTURE SHRI RAO BIRENDRA SINGH'S VISIT TO CENTRAL INLAND FISHERIES RESEARCH INSTITUTE, BARRACKPORE.

Sri Rao Birendra Singh, Hon'ble Minister for Agriculture and President, Indian Council of Agricultural Research visited CIFRI on 28th December, 1983. He was received at the Institute by Dr. A.V. Natarajan, Director, Central Inland Fisheries Research Institute. The Minister was given a rousing welcome by scientists and staff of the Institute who had assembled at the portico.

### 'CIFRI, AN INSTITUTE OF HIGH NATIONAL IMPORTANCE'

In his address to the scientists and staff of the Institute the Hon'ble Minister described CIFRI as an 'Institute of high national importance' entrusted with research towards development of inland fisheries sector and thereby providing high quality protein to the people. He exhorted the scientists and other members of staff to fulfil their duties with single minded dedication and live upto the aspirations of the community they serve. He impressed upon the staff that by pursuing the development of in-



land fisheries they are serving a noble cause of feeding the millions.

Earlier, soon after his arrival at the Institute, the Hon'ble Minister was closeted with the



Director and his senior colleagues. The Minister was apprised of the organisational structure, staff strength, major activities and achievements of the 3 Divisions and 4 Coordinated Projects of the Institute.

in the CIFRI stall wherein the achievements of the Institute in fresh and brackishwater aqua-

culture were displayed through live specimens, models, charts, blow-up photographs etc.

### ENORMOUS SCOPE FOR IMPROVING INLAND FISH YIELD

In his address to the staff, Shri Rao Birendra Singh also pointed out that the country was endowed with a variety of inland fisheries resources like lakes, rivers, tanks and brackishwater impoundments. He remarked that there was enormous scope for improving fish production from these inland waters. Comparing the inland fisheries with marine sector, he pointed out that the retrieval from freshwater bodies was much easier than from sea and the former made much less demand on investment for development and exploitation. Logically, there was no reason for inland fish production to trail behind in production from marine sources. The Minister highlighted the rich heritage of fish genetic resources of our country and asked the scientific community to make all efforts to conserve them.

Later, the Minister visited the ICAR Pavilion in Calcutta Maidan. He evinced keen interest

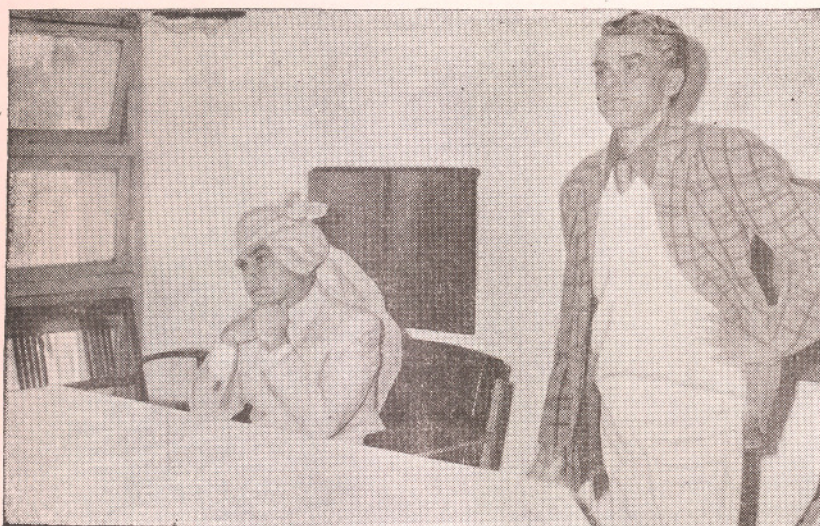


*The Hon'ble Minister being received at the Institute by Dr. A.V. Natarajan, Director.*

*Minister in discussion with the Director and senior scientists of CIFRI*

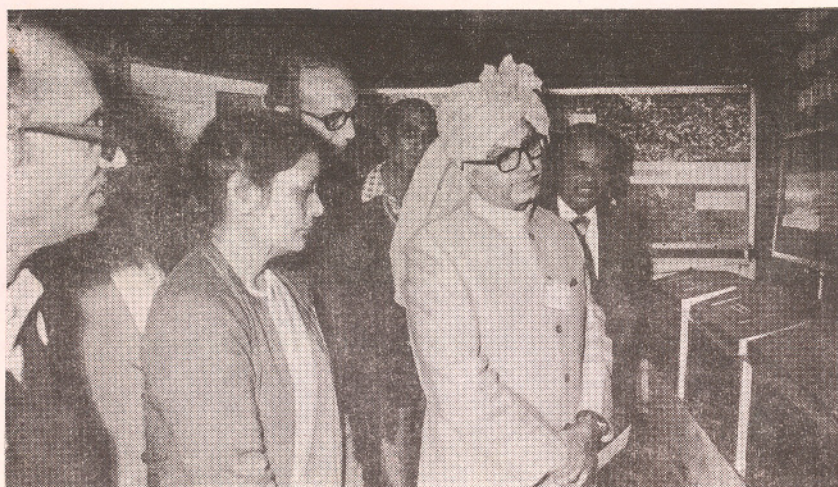
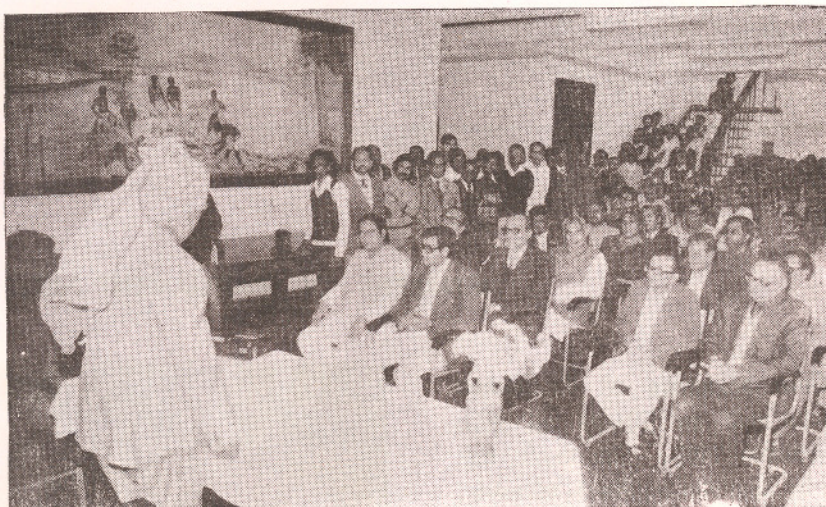






Dr. A. V. Natarajan,  
Director welcomes the  
Minister.

The Minister addressing the scientists  
and staff of CIFRI.



The Minister visiting the CIFRI Pavilion  
at the All India Exhibition, Calcutta.





The Minister in discussion with scientists at the CIFRI Pavilion.

## MEMBERS OF PARLIAMENT VISIT CIFRI

Four Members of Parliament paid a visit to CIFRI on 29th December, 1983. The team was led by Shri Ranbir Singh, Member, Lok Sabha. The MPs evinced keen interest in the activities of the Institute. Dr. A V. Natarajan Director, CIFRI briefed them on the work of the Institute and the achievements made in areas like freshwater fish culture, brackish water fish culture and capture fisheries.



MPs being briefed by the Director on CIFRI's achievements.



## *Culture of Giant freshwater prawn in treated sewage-fed ponds*

Giant freshwater prawn, *Macrobrachium rosenbergii* grows very well in treated sewage-fed ecosystem. In integrated farming experiments in designed paddy fields using treated sewage water the prawn gave a production rate of 264 kg, paddy 1,700 kg and silver carp 163 kg respectively in one ha of paddy plot. The silver carp was introduced to control the algal blooms.

## *Record fish production in semi-arid zone at Karnal (Haryana)*

Fish production to the tune of 8,208 kg/ha/8 months was obtained at Karnal Centre of CIFRI. This is the highest production from the region so far in experimental trials on composite fish culture in Haryana. A six species combination of catla, rohu, mrigal, silver carp, grass carp and common carp at a stocking density of 4,000 fingerlings under scientific management resulted in this record production.

## *Fish genetic engineering*

Artificial gynogenesis based on inactivation of sperm and diploidisation of maternal chromosomes was used for producing

gynogenetic populations of catla and silver carp. Gynogenesis is an important tool in fish genetic research to produce inbred lines with a high degree of homozygosity of characters aimed at improving productivity of fish.

## *Low input carp culture technology*

A low cost composite fish culture technology without resorting to any artificial feeds has been successfully demonstrated at the Jaunpur Research Centre (U. P.). Management measures included intensive fertilisation with nitrogenous or phosphatic fertilisers. A six species combination yielded 3,333 to 3,985 kg/ha in 9 months. From a 0.1 ha pond fish worth Rs. 3,576 to Rs. 4,241 were raised against an input level Rs. 376 to Rs. 479 only.

## *A new therapy for a fish bacterial disease*

An uncommon bacterial disease that infected *Clarias batrachus* in a private farmer's pond at Port Canning was successfully treated with sulphadiazene. Symptoms of the disease included loss of barbels or swelling at the root of barbel, reddish mouth, fin rot and dermal ulcers. Sulphadiazene

was administered @ 100 mg/kg of feed for seven days and after treatment an almost total recovery was achieved.

## *Culture of common carp in Kashmir rural ponds*

Common carp was cultured in village ponds in Kashmir adopting low inputs and a production @ 3,000 kg/ha/7 months was achieved. Pond fertilisation was done by diverting the domestic and cattle wastes of the village into the pond. Fingerlings were stocked at the rate of 7000/ha and the fish grew from 40 g to 500 g in just 7 month rearing period.

## *Breakthrough in larval rearing of *Macrobrachium malcolmsonii**

Larvae of freshwater prawn *M. malcolmsonii* were reared on a new diet to post larval stages at the Kakinada Centre of CIFRI. The parent stocks were collected from the wild and the zoea were reared on a formulated feed made of flesh of blood clam and broken rice. The larvae completed all the stages of metamorphosis in 51 days under ambient water temperature of 26 to 31.5°C.





△  
1

1. A panoramic view of the pen erected in Manika man Muzaf
2. Harvesting fish from the pen
3. Progressive farmers and fishery co-operatives erect pen under
4. Nationalised Banks based on CIFRI Technology
4. A haul of fish from the pen

3  
▽







## *PEN CULTURE IN OX-BOW LAKES IN BIHAR*

Pen culture of Indian major carps recording a production rate of 4 t/ha, suitable for adoption in reverine wetlands, has been demonstrated successfully at a 0.1 ha pen erected at Manika man (ox-bow lake) in Gandak system, Mazaffarpur, Bihar with a production of 400 kg consisting of catla, rohu and mrigal in a rearing period of 6 months. Pen culture in ox-bow lakes and wetlands holds immense promise as an additional source of fish production from such waters. The pen culture ensures a 76.2% return on investment.

World Food Programme team also deeply appreciated the significant success achieved by CIFRI in Pen culture and is taking up projects on similar lines.

farpur, Bihar

er financial aid from

2▷





## PADDY-CUM-FISH CULTURE IN SALINE TRACTS IN LOWER SUNDERBANS

The collaborative research efforts of CIFRI and CSSRI have demonstrated the technical feasibility of brackishwater paddy-cum-fish culture in low lying saline tracts in lower Sunderbans. This technology adds a new dimension to the concept of integrated farming providing potential for more than 1 t of fishes and prawns per hectare without reducing the rice yield in any manner.

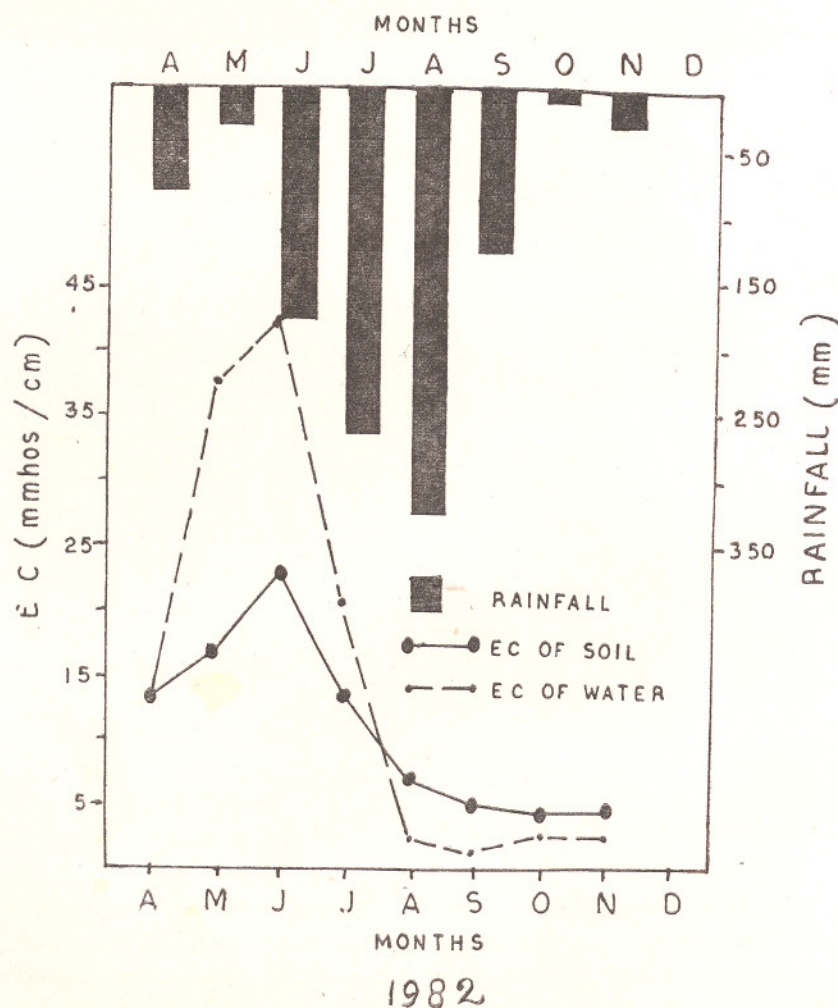
The coastal saline soil permits only one rice crop during kharif season and the land remains fallow for the rest of the year due to high salinity and lack of good irrigation water. The experiments were mainly aimed at utilising the paddy plots for brackishwater aquaculture during the summer months, when normally the fields remain fallow. Later freshwater fishes and prawns are grown along with paddy.

The experiments were conducted in two 0.015 ha rice plots at Canning. In April 1982, the fallow rice plots were filled with saline tidal water from the nearby river using a sluice gate. Tiger prawn (*P. monodon*) and mullet (*L. parsia*) were reared for 86 days yielding 0.65 t of fish & prawn/ha in June. Water salinity ranged from 12.5 to 40.0 mmhos/cm which increased soil salinity from 7.8 mmhos to 24 mmhos/cm.

Monsoon precipitation lowered the soil salinity after June. EC dropped to 7 mmhos by August when one month old seedlings SR and Assam(S) were transplanted in each plot. Standard cultivation practices were followed. As the monsoon conti-

nued, EC, declined to an average 4.8-5.8 mmhos/cm. During kharif season, some freshwater fishes and prawns like *L. rohita*, *C. catla*, *C. mrigala*, *H. molitrix* and *M. rosenbergii* were also stocked at the rate of 23,500/ha along with paddy; the prawn fish ratio being 2 : 1.

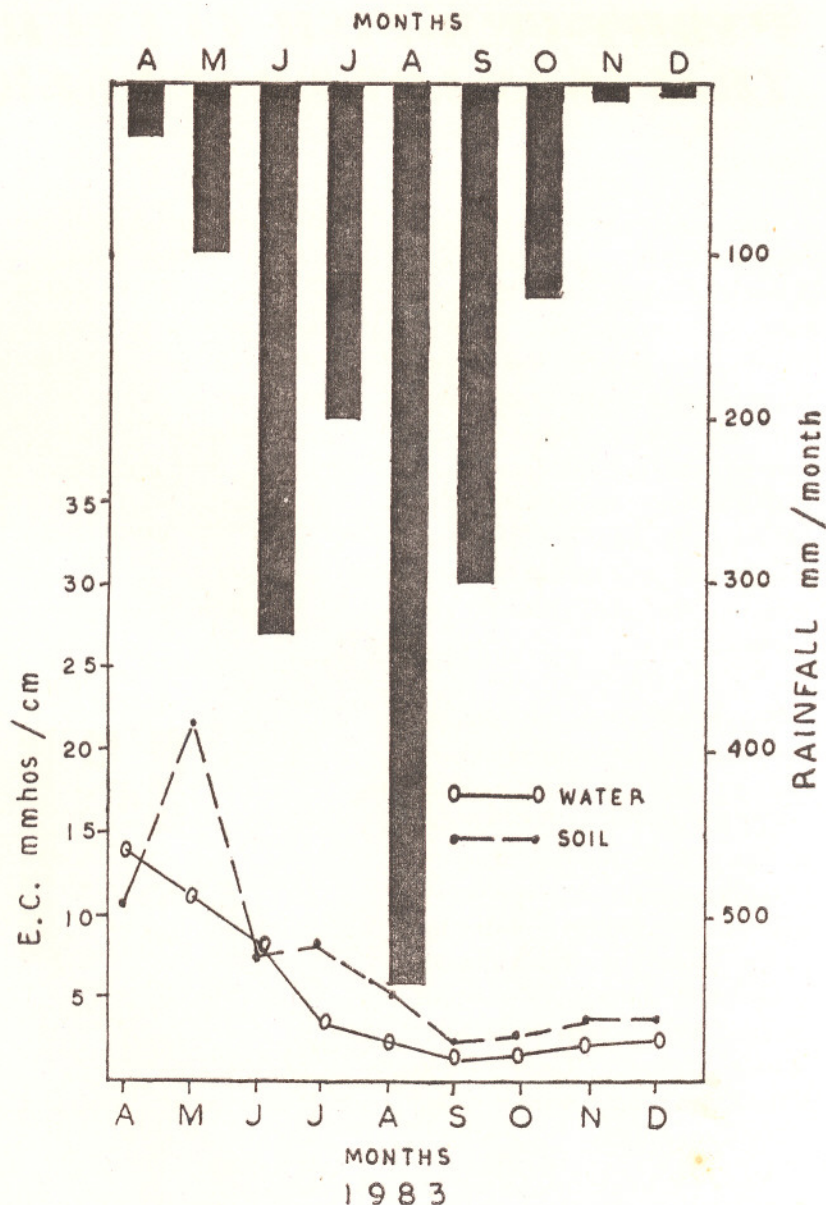
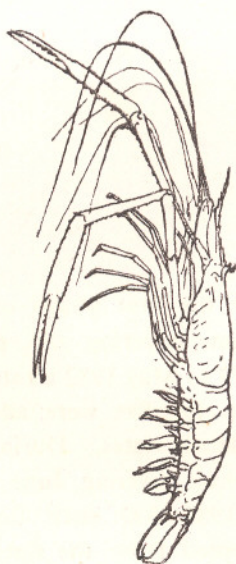
Rainfall and salinity at paddy-cum-fish culture plots 1982





Paddy was harvested in late November, 1982; the average yield worked out to be 3.1 t/ha. Fishes and prawns harvested at the same time yielded 0.51 t/ha after 83 days of rearing.

The experiment was repeated in 1983 in two plots of the same dimensions. Tiger prawn (*P. monodon*) and mullet (*L. parsia*) (1:1) stocked at the rate of 43,000/ha yielded 0.41 t/ha in 90 days in summer season. During paddy season, *P. javanicus* and freshwater prawn (*M. rosenbergii*) yielded 0.48 t/ha and paddy 3.2 t/ha.



Rainfall and salinity at Paddy-cum-fish culture plots 1983

## MANPOWER DEVELOPMENT

Dr. H. C. Joshi, Scientist attended the School on Toxicology of Pesticides from 17-19 November, 1983 at the Regional Research Laboratory Hyderabad. The

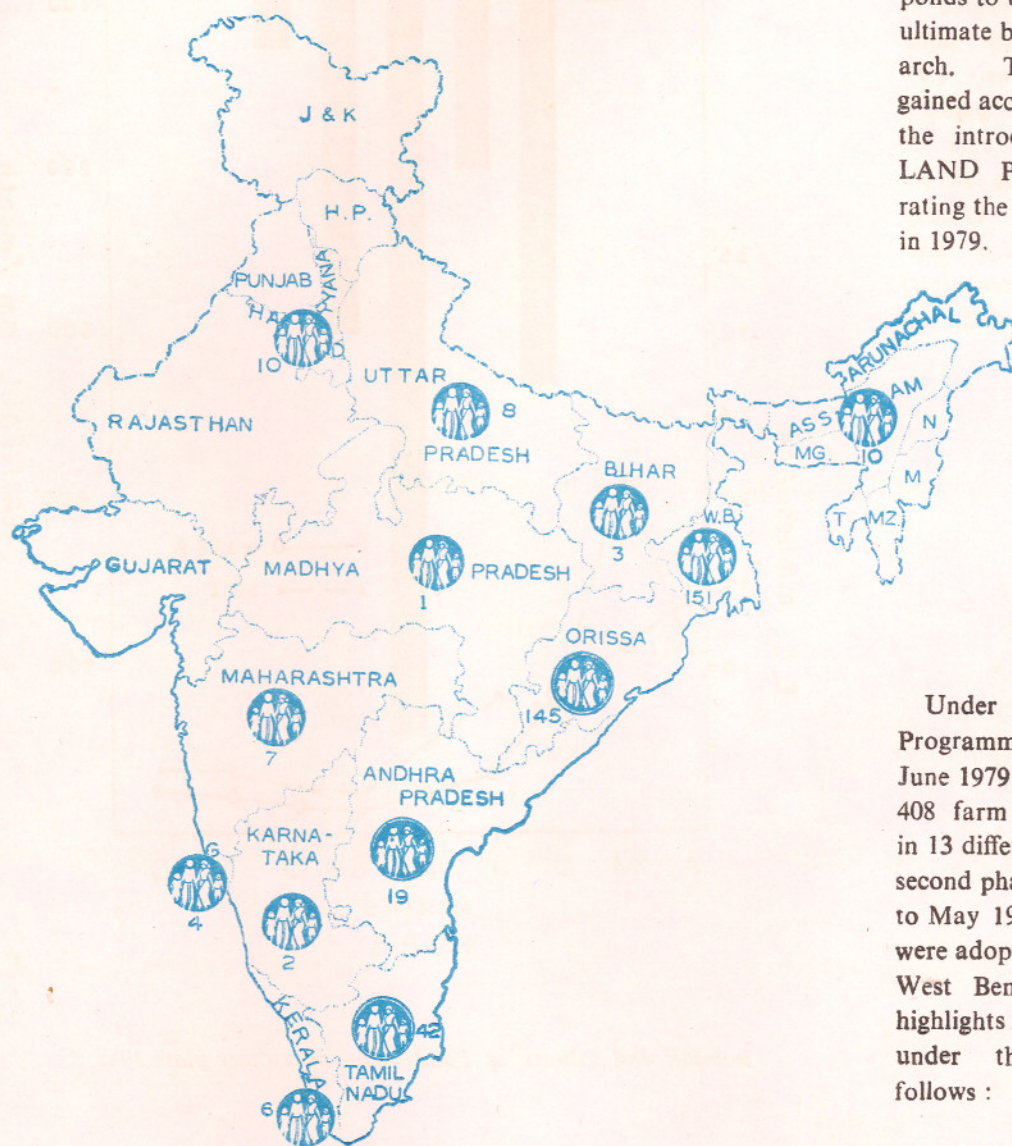
School comprised lectures and workshop on biological and toxicological evaluation structure activity relationship, target enzyme interaction, selectivity, neurotoxi-

city and delayed neurotoxicity, *in vitro* and *In vivo* metabolism, persistence and decomposition, residue analysis and computer aided statistics.



## CIFRI's achievements under Lab to Land Programme

It has always been the endeavour of CIFRI to disseminate the knowhow developed at the laboratories and experimental ponds to the farmers who are the ultimate beneficiaries of farm research. The extension activities gained accelerated momentum with the introduction of LAB TO LAND Programme commemorating the Golden Jubilee of ICAR in 1979.



Map showing number of farm families adopted by CIFRI in various States.

Under the first phase of the Programme, covering the period June 1979 to May 1982 a total of 408 farm families were adopted in 13 different states. During the second phase covering June 1982 to May 1984 300 such families were adopted from the states of West Bengal and Orissa. The highlights of extension activities under the programme are as follows :



**Composition of farm families :**

	<i>I Phase</i>	<i>I year of II phase</i>
Total No. of families	408	300
No. S/C farm families	79	101
No. S/T farm families	18	2
No. Landless farm families	160	77
No. Marginal and small farm families	248	223
Total water area	94 ha	37 ha

**Extension activities :**

	<i>I Phase</i>	<i>I year of II Phase</i>
No. personnel trained	4284	217
Fish Farmers' Days	38	3
Extension literature published	44	
Film shows	137	10
Radio/TV Programme	11	

**Fish seed production obtained during Lab to Land demonstrations :**

	<i>I Phase</i>	<i>I year of II Phase</i>
Indian major carps spawn	10 lakhs	10.6 lakhs
-do- fry		7.56 lakhs
-do- fingerlings		87,000
Common carp spawn	150 lakhs	16.4 lakhs

**Fish production obtained and demonstrated under different technologies under Lab to Land Programme :**

<i>Sl. No.</i>	<i>Technology adopted</i>	<i>Maximum production obtained</i>
1.	Composite fish culture	6626 kg / ha / yr
2.	Magur culture	3260 kg / ha / 8 months
3.	Monoculture of <i>P. monodon</i>	476 kg / ha / 4 months
4.	Monoculture of <i>P. indicus</i>	374 kg / ha / 3½ months
5.	Polyculture of brackishwater fish and prawn	2240 kg / ha / 11 months
i)	Paddy-cum-fish farming	Paddy 4976 kg / ha / yr Fish 1107 kg / ha / yr
ii)	Duck-cum-fish farming	Fish 3500 kg / ha / yr
iii)	Pig-cum-fish farming	Fish 4600 kg / ha / yr



## National Workshop on Inland Fishery Resources

A National Workshop on Inland Fishery Resources jointly organised by Government of India, Indian Institute of Management and Indian Society of Agricultural Economics was held at I.I.M. Ahmedabad during 1-3 November, 1983. The main objective of the workshop was to delve deep into economics of production marketing and development of inland fisheries based on findings of a study viz., 'Marketing of Inland Fish in India'. His Excellency, the Government of Gujarat, Prof. K. M. Chandy was the Chief Guest. The inaugural address by Shri S. B. Chavan, Union Minister of Planning was delivered in absentia by Dr. K. Kanungo, Advisor (Agriculture) Planning Commission, New Delhi. The workshop was well attended by a cross section of administrators, planners, academicians, researchers and functionaries of cooperative and funding organisations. ICAR was represented at the highest level by participation of Dr. O. P. Gautam Director-General, Dr. R. M. Acharya, Deputy Director-General, Dr. P.S.B.R. James, Assistant Director General and Dr. A. G. Jhingran, S-3 (fisheries).

Dr. A. V. Natarajan, Director, CIFRI was invited with the request to act as a discussant in a technical session on Freshwater Culture Fisheries. S/Shri K. K. Ghosh and S. Paul, Scientists of CIFRI also attended the workshop.

### Technical sessions

The workshop spanned into eight technical sessions and one plenary session. The technical sessions on overview of inland fish marketing, fish seed production, fresh water culture fisheries, reservoir fish system, brackishwater culture, cooperatives and role of financial institutions, riverine fish system and data base for planning and control were chaired by S/Shri S.P. Jakhanwal, Joint Secretary (Fisheries), B. C. Sharma, Secretary (Fisheries) West Bengal, Dr. P. V. Dehadrai, Fishery Development Commissioner, Dr. R. M. Acharya, DDG, ICAR, S.N. Rao, Chairman, Vijao Ranchon, IAS, Commissioner, Gujarat Fisheries and V. D. Singh, Dy. Commissioner, Fisheries respectively.

### Unrealistic sampling

While acting as a discussant in a technical session on Freshwater culture fisheries Dr. A. V. Natarajan pointed out that the FSL of the average pond area of the country shown as 5.3 ha based on the multi-stage stratified sampling was unrealistically high reflecting total inadequacy of the sampling size. There was also a mix-up of pond and reservoir resources needing segregation.

### Yield rate vis-a-vis area

Since the yield rate as well as input rate both are negatively related to the pond size it is not correct to assume that the pond area in the class range 0-0.4ha (average size 0.18 ha) are the optimum pond size for carp culture. It is technically feasible to get the same yield rate for 10 ha water area as effectively as 0.18 ha pond area provided the input rate in terms of seed, feed and fertilizer are on same level. It was also pointed out by Dr. Natarajan that the concept of effective storage level arrived on the basis of first degree polynomial equation is defective in many respects and has no particular merit for adoption. All these remarks were accepted by Prof. Gupta of Indian Institute of Management, Ahmedabad. Dr. Natarajan pointed out that large water bodies required large working capital like Rs. 2½ to 3 lakhs per 10 ha water area and as such would not be utilised effectively by resourceless poor farmers. It is pragmatic if a policy decision is taken up so that ponds of water area of 1 ha and below is leased out to small and marginal farmers while big water bodies are handled by cooperatives, corporations or private entrepreneurs.



### Scope for higher production

It was pointed out on the basis of IIM Report that average rate of stocking is as much as 2000 standard fingerlings per ha and may be considered good enough. Dr. Natarajan was of the view that the rate of application of fertilizer and feed in fish culture practices in the country as per IIM Report was very low and adoption of carp culture technology was partial in terms of species-mix and input-mix resulting in low average production of the order of 369 kg per ha from carp pond. The production can be easily raised to 3 lakh tonnes at the existing rate of stocking at existing utilised pond water area of 3 lakh ha as against 1 lakh tonne presently harvested, Dr. Natarajan pointed out.

### Reservoir management

The IIM, report on the Reservoir Fisheries was reviewed by Dr. Raghavachari. During discussions Dr. A. V. Natarajan expressed the view that many technical and remedial prescriptions contained in the report were perfunctory and had no technical merit. Stocking rates, mesh size etc. given in the report were arbitrary. Reservoirs markedly varied from one to another in ecological parameters, production characteristics and biotic communities and as such no general norm could be given in terms of stocking rate, species-mix, mesh size and fishing efforts etc. except in general way, Dr. Natarajan pointed out.

In a session on riverine fisheries Dr. Natarajan emphasised the need for the inclusion of beel fisheries alongwith rivers as the two were components of a single system for the purpose of management.

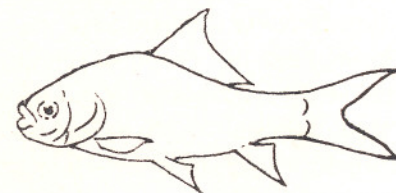
In a session on brackishwater, Dr. A. V. Natarajan pointed out the dissimilar character of traditionally practised large size filtration system and brackishwater pond culture system both in terms of production units and culture practices.

Shri K. K. Ghosh presented a paper outlining the inadequacies of data base in inland fisheries.

Shri S. Paul, Economist, CIFRI during the course of discussions

made an indepth analysis of issues pertaining to demand and supply imbalances, price behaviour, investment criteria, possessory rights of water bodies, conservational aspects and development possibilities in near future.

The workshop concluded on the afternoon of 3rd November, 1983 with valedictory address by Dr. O. P. Gautam, Director-General, Indian Council of Agricultural Research. □



## STAFF NEWS

### Kohli joins CARI

Shri M. P. Singh Kohli S-I at Gauhati Centre joined Central Agricultural Research Institute, Port Blair as Scientist-2. □

Dr. D.V. Pahwa, Scientist-2 at FARTC Dhauli is transferred to the Headquarters of ICAR. □

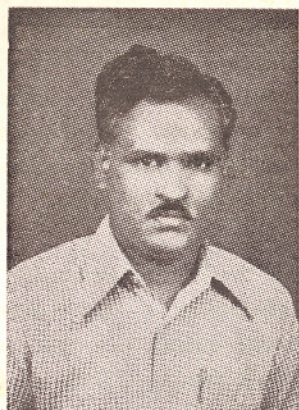
Shri A.K. Srivastava, Jr. Clerk at FARTC Dhauli is transferred to Allahabad. □

## PH. D. AWARDS

K. J. Rao

Shri K. Janardhana Rao, Scientist, Tadepalligudem Centre obtained doctorate from Andhra University, Waltair on the thesis entitled 'Studies on the fishery and biology of important prawns of Lake Kolleru in Andhra Pradesh with an account of *Macrobrachium rosenbergii* culture in pond ecosystem'. He has made an objective assessment of living aquatic resources of Kolleru Lake with special emphasis on the two freshwater prawns, *Macrobrachium rosenbergii* and *M. malcolmsonii*.





Dr. K. J. Rao

that abound the lake. Pond culture of these two prawns in combination with Indian and exotic carps has been tried with a view to evolving suitable production technologies. The thesis also throw enough light on the age and growth, maturity, spawning and population dynamics of the two freshwater prawns of Kolleru Lake. □

K. V. Ramakrishna

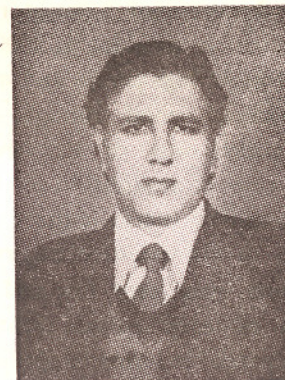
Shri K. V. Ramakrishna, Scientist, Madras Research Centre

of CIFRI has been awarded the degree of Ph.D, by the Andhra University, Waltair for his thesis 'Studies on the ecology, biology and culture of edible oyster, *Crassostrea madrasensis* of Pulicat, India'. He has studied the ecology of oyster beds, oyster biocenosis and various aspects of oyster biology. The thesis gives a good account of the food and feeding habits, breeding, age and growth of the oyster. Different methods of oyster culture are tried. The work indicates the possibility of evolving new techniques to culture the oyster in combination with some fishes. □



K. V. Ramakrishna

M. A. Khan



Agra University has conferred the degree of Ph. D. to Shri M. A. Khan, Scientist of Allahabad Centre. Dr. Khan's thesis entitled 'On some aspects of biology of *Notopterus notopterus* of Tila-ya Reservoir, Bihar' deals with feeding and breeding biology, age and growth and raciation of *Notopterus*. □

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