



Fish Technology newsletter

Vol. II No. 10 OCTOBER - DECEMBER 1980



A view of the audience of the Seminar on Fisheries Extension held in December, 1980 at CIFT, Cochin (Report on page 4)

CENTRAL INSTITUTE OF FISHERIES TECHNOLOGY

MATSYAPURI P. O.

COCHIN - 682 029



CONTENTS

	Page
1. Foreword	3
2. Seminar on Fisheries Extension	4
3. Lab-to-Land Programme of CIFT - 12	7
4. Modern Traps for Lobster Fishing	9
5. Development of Fisheries in Konkan	10
6. Fishing Boat for Reservoirs: Fishtech No. 10	12
7. FAO Invites CIFT Scientist	12
8. Dr. Panduranga Rao, CIFT Director	13
9. ICAR Tournaments	13
10. Gleanings from other Journals	14
11. CIFT Appointments	15
12. Meet Our Scientists	16

Foreword

EDITORIAL COMMITTEE

Shri BALASUBRAMANYAN
Chairman

Shri K C. PURUSHOTHAMAN
Secretary

Shri P. MADHAVAN
Member

Dr. P. N. KAUL
Member

Photography Shri K. BASKARAN

Art Shri G. MOHANAN

Abbreviation: Fishtech News

Fish Technology Newsletter issued every month is intended to bring the fishery industry in India in touch with some of the important developments in fisheries technology resulting from investigations carried out at this Institute and elsewhere. It is not a research publication. Every effort has been earnestly made to express the ideas in non-scientific language. Its ultimate aim is the application of the results of contemporary research for the advancement of our fishery industry.

Fish Technology Newsletter does not owe allegiance to any manufacturer, patent, product or development agency unless otherwise specified. Its purpose is to open up a communication channel through which useful ideas can be exchanged, problems discussed and success shared. The process of exchanging views and opinions makes it easier to identify the real issues and that is where problem-solving begins.

We welcome contributions from any source which will help to achieve our above-mentioned aim. The sources of all such contributions will be acknowledged. We sincerely hope that the current events and informations contained in the columns "GLEANINGS FROM OTHER JOURNALS" and "LET'S TALK IT OVER" will be of interest to the Indian fishing and fish processing industries.

We also welcome suggestions from our readers for improvement in the contents and get-up of Newsletter. Any part of this publication may be reprinted in any language if the translation is true and the source is acknowledged.

Editorial Committee.

Seminar on Fisheries Extension

A three-day national seminar on fisheries extension, the first of its kind in the country, was held at the Central Institute of Fisheries Technology, Cochin, from December 8 to 9, 1980.

The seminar was jointly organised by the four Fisheries Institutes of ICAR—Central Marine Fisheries Research Institute (CMFRI), Cochin, Central Inland Fisheries Research Institute (CIFRI), Barrackpore, Central Institute of Fisheries Technology (CIFT), Cochin and Central Institute of Fisheries Education (CIFE), Bombay.

The objects of the Seminar were to review the present status of Fisheries Extension,



Dr. P. N. Kaul, Scientist-in-charge of Extension, Information and Statistics division, CIFT, Cochin, presenting the paper on 'Technology Generation and Transfer for Fisheries Development' on behalf of CIFT. Next to him (sitting) are Dr. C. P. Natarajan, Dr. E. G. Silas, Prof. H. P. C. Shetty, and Dr. C. C. Panduranga Rao.

discuss the problems and evolve an action plan for strengthening and streamlin-

ing the vital field of Fisheries Extension which remains one of the weakest links in the Fisheries development programme.



Delegates visit CMFRI's scientific prawn culture farm at Narakkal in Ernakulam District

Over 75 extension experts/delegates representing the Ministry of Agriculture, Govt. of India, Fisheries Departments of Maritime and Inland States and Union Territories, Agriculture Universities and the four ICAR Fisheries Institutes participated in the seminar.

Thirty four papers on subjects like organisational set-up and linkage, technological needs of Fisheries Extension, Fisheries Extension



Dr. C. C. Panduranga Rao, Director, CIFT inaugurates the Exhibition on Fisheries Extension

Methods, Input supply and Output Management, Extension, Education and Training, Public Policies and Planning for Fisheries Extension etc; were presented and discussed in detail.

While welcoming the delegates on the opening day, Dr. E. G. Silas, Director, CMFRI, said the present seminar would fulfil a long felt need for discussing the problems of fisheries extension in the country. "The character of the fisheries development", he said, "is vastly changed today and we are in the threshold of a new era armed with better knowledge of the fisheries resources, the possession of an Exclusive Economic Zone in our seas, improved and new technologies for increasing production through culture, a well established processing industry,

greater research support and above all, a realisation of its potential is one of the nation's major assets". Dr. Silas emphasised the need for evolving a national policy on Fisheries Extension and to provide necessary technical, administrative and financial support.

The status reports presented by the delegates from the states/union territories pointed out that extension had not received proper share of their fisheries development programmes. The extension wings wherever now available had been established only in the recent years. According to them many states did not have an extension set up at all.

The delegates identified several gaps which needed to be bridged in order to put the available technology into use for increasing fish production and improving the socio-economic conditions of the rural fisheries section. One of the senior participants, Shri A. K. Kawatra, Director and Warden of Fisheries, Punjab, stated that the



A view of CIFT Pavilion

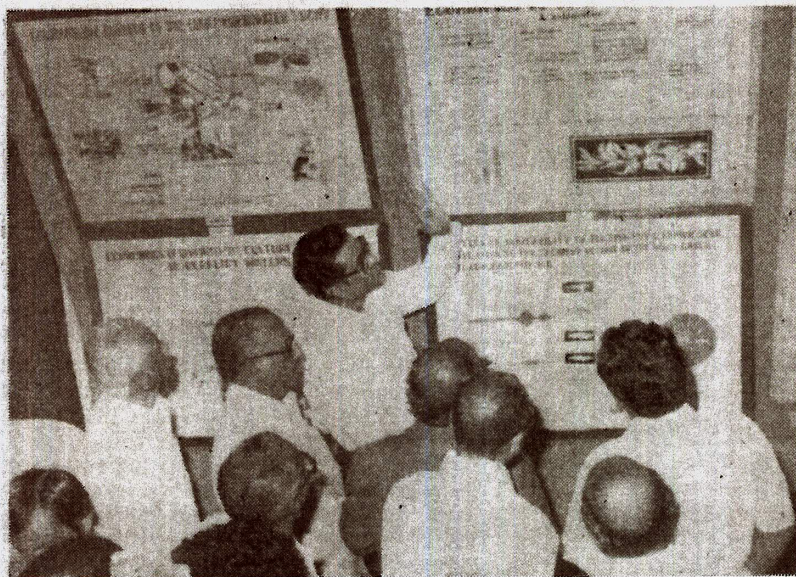
Central Scheme for fisheries extension should be reviewed.

Besides presentation of and discussion on papers, the delegates formed themselves into six task forces to develop strategies and action plans in identified subject areas, including organisational set-up, extension methods and extension education.

Earlier, Dr. C. C. Panduranga Rao, Director, CIFT, opened an exhibition on Fisheries Extension organised in connection with the Seminar at CIFT premises.

The second day session of the seminar was presided over by Shri A. G. Vasavan, Director of Fisheries, Kerala.

Prof. H. P. C. Shetty of the Fisheries College, Mangalore, urged the need that



CIFRI Pavilion



CIFE Pavilion

everybody concerned with extension education must be trained in extension methods also. "We have all to learn from one another", he said.

After much deliberations and group discussions, the seminar formulated specific

recommendations and action programmes to be submitted to the Govt. of India for approval.

Some of the major recommendations are:

1 There should be explicit linkage among the extension wings of the Centre, States, ICAR and Universities. To ensure prompt transfer of technology services and welfare programmes, finance and other input supply systems should be established at different levels.

2 Taking into consideration that traditional fish production techniques in this country are fairly old, while all advantages for the incorporation of modern technology be taken wherever necessary and applicable, suitable blending of traditional practices

LAB-TO-LAND PROGRAMME OF CIFT - 12

One of the highlights of the Golden Jubilee celebrations of the Indian Council of Agricultural Research observed last year was a country-wide programme of transfer of technology known as the Lab-to-Land programme to which CIFT is also contributing in a humble way. In the previous issues we published reports on such programme held at Mangalore, Bombay, Kumarakom, Calicut, Kumbalam, Vaikom, Veraval, Madras, Cochin, Kakinada Elathur and Badagara. In this issue we present a report on programmes taken up again at Cochin. Kerala.

Preparation of low priced Fish Products

As part of the Lab-to-Land Programme of CIFT a demonstration on the preparation of poultry feed mixture and fish soup powder was organised on September 6, 1980 at Chellanam village near Cochin. All the members of 35 families adopted

by CIFT for implementing its Lab-to-Land programmes at this fishing village attended the demonstration.

The programme was inaugurated by Dr. P. N. Kaul, Scientist-in-Charge (Extension) of CIFT, in a meeting presi-

ded over by Fr. Marcel paliath, Chrch priest of Chellanam Village. In his presidential address, Fr. Marcel paliath explained the efforts of CIFT under Lab-to-Land Programme at Chellanam and called for the cooperation of participants to try the new

and sophisticated modern technology be made.

3 The Research Institutes and Agricultural Universities should devote attention to develop location of specific technologies, taking into consideration the diverse biogeographical and hydro-geographical situations existing in the Marine and Inland States and Union Territories

4 The Research Institutes and Agricultural Universities should announce the technologies as ready for transfer only after repetitive field testing and adoptive trials and after proving their suitability for particular locati-

ons and establishing the economic viability.

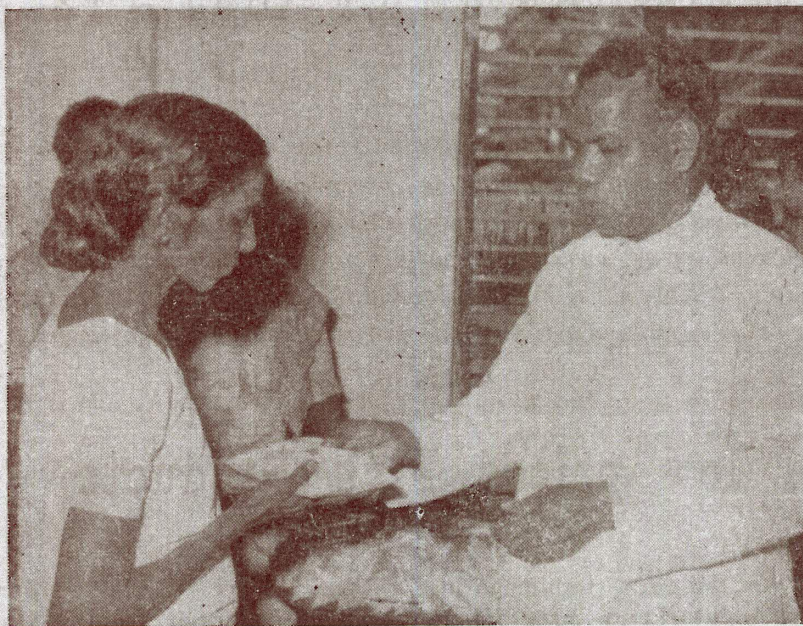
5 The Fisheries Departments of the States and Union Territories should plan accelerated training programme for extension workers on the effective use of mass media such as Radio, Television, News Papers, Exhibition etc. and other allied aspects on extension and communication systems in the Agricultural Universities and ICAR Institutes which have multi disciplinary activities and are equipped for imparting such training.

6 Researches in extension education and extension meth-

ods be taken up in order to evolve extension systems and methods suitable for different fisheries sectors.

7 The Govt. of India may make policy decision to give priority to fisheries extension as part of programme planning for fisheries development.

8 The Centre as well as the States should make adequate financial outlay for fisheries extension programme and support the programme with necessary infra-structure. Such financial outlays should be reasonably adequate to cover the needs of Fisheries Extension. □



Fr. Marcel Paliath of Chellanam Church distributes sample packets of fish soup powder

technologies developed at CIFT.

Shri M. K. Kandoran, Scientist S-2 (Extension), welcomed the gathering and Shri S. Balasubramanian S-1 (Extension), expressed the vote of thanks.

Shri Ramachandran Nair, Scientist-S-1 (Fish Processing), demonstrated the preparation of poultry feed mixture and fish soup powder. The participants were told that during peak seasons of fishing, the low priced fishes could be utilised for preparing the fish soup powder which would be a nutritious food to children suffered by malnutrition, especially, during off seasons of fishing.

The advantages of preparing a nutrition feed for poultry with the locally available materials like prawn shell waste, dried fish powder, tapioca powder, rice brans, and ground nut cake at a

low cost were also explained to the participants. Leaflets regarding the preparation of poultry feed mixture and fish soup powder were distributed to the participants.

At the end of the programme, for motivating the participants to adopt the new technologies, free samples of fish soup powder and poultry feed mixture which would be sufficient for a month were distributed.

From the bench mark survey of the 35 families at Chellanam, data such as number of birds/family, number of children/family were taken and accordingly, quantity of fish soup powder and poultry feed mixture per family were calculated. The fish soup powder was given to the children below 12 years @ 0.150 gm. per child per family for a period of 1 month and 33 families received it.

(Continued on page 10)



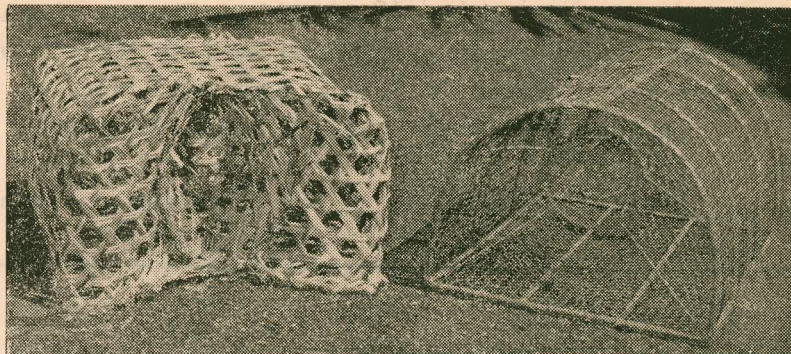
Children of the fishermen families being fed fish soup

Modern Traps for Lobster Fishing

Rock Lobsters or Spiny Lobsters are a highly favoured item of sea-food in foreign countries. Increased demands from abroad for Indian lobsters have given a new filip to this hitherto less exploited fishery.

An important lobster fishery worthy of its name now exists only along the rocky inshore waters of the south-west of India covering the maritime States of Tamil nadu and Kerala while in other coastal areas the fishery is less significant.

Survey conducted by CIFT has revealed a number of traditional methods of lobster



Indigenous trap (left) and the modern metal trap (right) for lobster fishing

fishing as practised by the local fishermen. Indigenous traps, anchor hooks spears, scoop nets and gill nets are the common fishing tackles used at present.

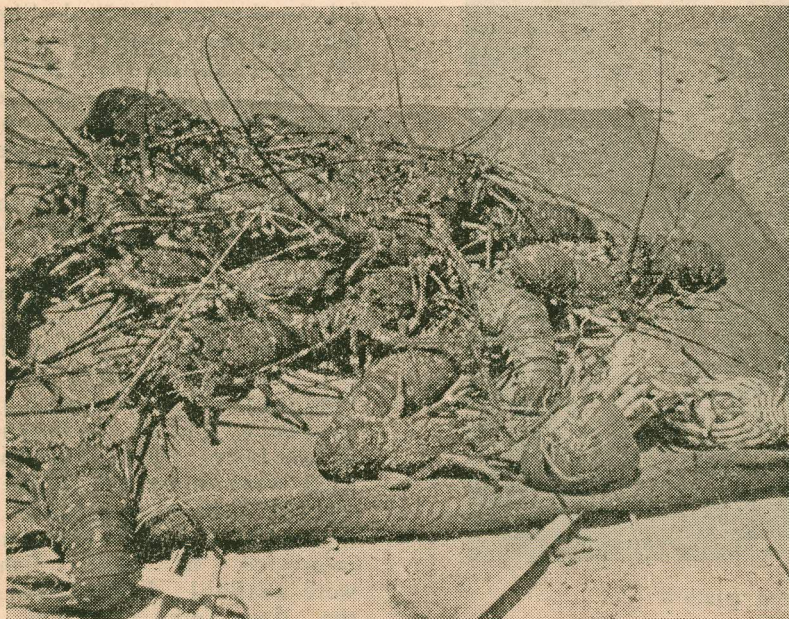
As result of comprehensive field studies so far made,

CIFT has developed a number of modern designs of lobster traps. Prototypes of wooden traps, bamboo traps and metal traps have been put to extensive field tests and trials and their efficiency is being compared with the traditional traps.

Improved bottom-set gill nets based on CIFT design and recommendations are already in wide use.

TECHNOLOGY FORECAST

1. Juvenile lobsters (young ones) if spared in large numbers to grow to more valuable sizes may contribute substantially to replace the adults removed by fishing.
2. Berried females (carrying eggs) if left alive, will keep up the breeding reserve.



Lobsters caught by traps

Development of Fisheries in Konkan

The State of Maharashtra is fortunately endowed by nature with marine resources which comprise a part of the Arabian Sea along the four maritime districts, Thana, Bombay, Kulaba and Ratna-

giri, having a total coastline of 720 kms. The area of continental shelf off Maharashtra, i. e. upto 100 fathom line, is 87,000 square kilometres.

In Maharashtra, the in-

shore area upto 10 fathom depth has been intensively fished by the indigenous sail boats and also small mechanized boats. So far as the offshore area, i. e. from 10 to 40 fathom depth is concerned,



Supply of poultry feed mixture

(Continued from page 8)

Poultry feed mixture was supplied @ 3.15 Kg. per bird per month and 24 families having birds in their houses received it during the programme.

After one month, as a follow up work of the programme, the extension division of CIFT assessed the response of the participants about the usefulness of the fish soup powder and poultry feed mixture and problems, if any.

Regarding the poultry feed mixture, all the 24 families, reported that it was very useful for them as the birds liked the feed very much. Majority of the families (87.5%) did not like to prepare the feed themselves as they have only 2-3 birds in their houses. But they were prepared to purchase, if it is made available in the market at moderate rate.

Regarding Fish soup powder, out of the 33 families children from 18 families (54.5%) liked it while in 15 families (45.5%) they were not interested due to difference in the taste. Only 3 families (9%) were interested to prepare the fish soup powder in their houses. Others were not interested as fresh fishes were available during most of the days and also due to financial constraints. □

fairly intensive fishing is done from 10-20 fathoms. Comparatively the intensity of fishing from 20 to 40 fathoms is much less. Fishing beyond 40 fathoms is almost non-existent except for a few mechanized boats operating from Thana District with gill nets for pomfrets. There is, therefore, scope to intensify the fishing efforts in the area from 20 to 40 fathoms and extend the fishing operations beyond 40 fathoms depending upon the economics of the operation. The Government of India has completed a survey of fishing resources off Maharashtra, Goa and Gujarat from 30 to 100 fathoms in collaboration with the Government of Poland.

There are some organizations in the private sector who would be willing to take up deep sea fishing projects provided the necessary infrastructure such as good harbour, sites for establishing processing plants, communication, shipping facility etc. are made available. Government's role at this stage could be to provide the aforesaid facilities and encourage foreign collaboration wherever necessary. This will also facilitate exploitation of fisheries resources in the 200 mile economic zone. The State Government is also making efforts to undertake Deep Sea Fishing with foreign collaboration through

the Maharashtra Fisheries Development Corporation Limited, a State Government undertaking.

The mechanization of the fishing craft was really a turning point in the development of the fishing industry. This has brought about extension in the fishing operations and increased production of fish. So far 2,697 mechanized boats are introduced by availing of the Government finance. Similarly, as an incentive to change over from cotton to synthetic fibres for fabrication of gear, subsidy is given by the Government. All these efforts have resulted in increasing the fish production from 1.34 lakh metric tonnes during First Five Year period to 3.58 lakh metric tonnes at present.

Associated with mechanization are other essential steps to be taken so as to make the programme a success. To impart knowledge of diesel engines and their maintenance to the members of the fishing community and to train them in improved methods of fishing, four training centres, one in each marine district, have been established where 176 fisher youths are trained every year.

Preservation of fish on landing is an important task in the development of marine

fisheries since fish is a quickly perishable commodity. Hence liberal financial assistance to fishermen's co-operative societies for establishment of ice and cold storage plants, purchase of transport trucks is being given by the Government.

During the Five Year Plan 1978-83 it is proposed to introduce about 368 mechanised boats expecting an increase in fish production of about 20,000 metric tonnes per annum.

The Maharashtra Fisheries Development Corporation Limited, which is planning to expand its activities, will also be assisted financially to undertake (1) deep sea fishing project, (2) processing and marketing of diversified fisheries products and (3) processing and export of shrimps. Thus, systematic efforts are made to develop the marine fisheries of the Konkan coast in all its aspects by associating the fishermen as closely as possible so that along with the development of fishing industry the socio-economic condition of the fishing community will also be improved. (INDIA to-day & tomorrow.)



Fishing Boat for Reservoirs: Fishtech No. 10

The Regional Research Centre of the C. I. F. T. at Burla (Orissa) has recently

acquired a new mechanized wooden boat for carrying out investigations on experimental

trawling in the Hirakud Reservoir and thereby boost up fish production of our inland waters

BOAT PARTICULARS:

Length over-all	:	9.14 M (30 ft.)
Beam maximum	:	2.82 M
Draft	:	1.20 M
Displacement	:	4.6 tons (approx.)
Main engine	:	45 BHP at 1800 r.p.m. with a 3:1 reduction gear
Propeller	:	775 mm dia./3 bladed
Deck machinery	:	2 drum trawl winch (CIFT design)
Speed	:	6 to 7 knots

The above boat was constructed at Cochin under the technical supervision of CIFT Scientists and as per CIFT design and specifications.

FAO INVITES CIFT SCIENTIST

Fishing Craft and Gear Technology

Specialists from Governments of member-countries and voluntary organizations directly involved in programme activities related to the subjects were invited to attend the consultation meeting convened at Madras during September 1980 (22 - 26th) and October, 1980 (13 - 17th) by the FAO/SIDA for the Development of Small Scale Fisheries under their Bay of Bengal Programme.

Shri R. Balasubramanian, Scientist-in-Charge of the Craft and Gear Division of C.I.F.T.,

Cochin, attended the above consultation meeting and actively participated in the deliberations. Specific subject matters were reviewed and discussed.

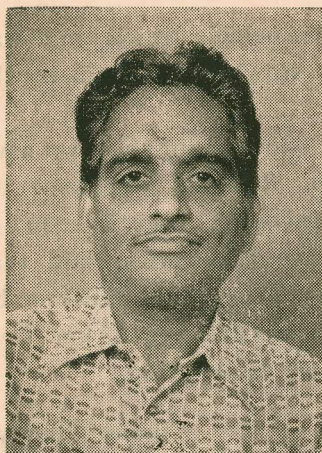
India, Bangladesh, Sri Lanka, Thailand and Malaysia were the participating countries besides BOBP Project Staff and Consultants.

The purpose of the consultation was to review the results, performance and scope of the work undertaken by the BOBP on fishing Craft, Gear and Methods so as to gener-

ate ideas and guidelines for (1) dissemination of conclusive results (2) suitable operational arrangements for ongoing and future activities and (3) future areas of work in the participating countries.

Under Fishing Craft technology (1) traditional fishing crafts (2) Beach Craft development and (3) Materials for boat-building formed the main field of discussion while consultation on Fishing gear and methods covered gill netting, demersal fishing, trawling and allied subjects.

Dr. Panduranga Rao, CIFT Director



Dr. C. C. Panduranga Rao, Scientist - S3 and Scientist-in-Charge of Kakinada Research Centre of CIFT took charge as Director of CIFT on December 1, 1980. The post of Director had fallen vacant following the death of Shri G. K. Kuriyan.

Dr. Rao, senior Bacteriologist of CIFT, hails from Bhimavaram, West Godavari District of Andhra Pradesh. He took his B. V. Sc degree from Madras University in 1954 and worked as Veterinary Asst. Surgeon/Extension Officer(A. H.) in Andhra State Service before joining the first batch for M. V. Sc. at Indian Veterinary Research Institute (IVRI), Izatnager/Mukteswar, U. P. in 1958.

After obtaining the Master's Degree, he joined the IVRI as Asst. Bacteriologist and carried out research work on different aspects of Veterinary and food bacteriology in addition to post-graduate teaching in Bacteriology and Immunology.

Dr. Rao under went training in Epideminology and Control of Communicable Diseases in man at the National Institute of Communicable Diseases, New Delhi in 1969-70 and proceeded to the United States of America for specialised training in Veterinary Public Health with special reference to Food Hygiene under a W. H. O. Travelling Fellowship.

On return. he joined the teaching staff of the Veterinary Public Health Division of IVRI.

He took his Ph.D. degree in 1972 and joined CIFT in 1975 as Scientist-S3.

ICAR Tournaments

In the second ICAR Zonal (Zone IV) sports meet held at Coimbatore from Nov. 16 to 23, 1980 CIFT retained all trophies of last year.

The Institute's Men team bagged the championship in Foot ball and Badminton, both singles and doubles. The

Ladies team were the runners up in badminton,(Singles and doubles).

First places in High Jump, Triple Jump and Javelin Throw were won by the athletic team. In all, the Institute secured 76 points.

The Zonal winners will

take part in the Interzonal Meet at Cochin for athletics and at Karnal for team events.

Dr. K. Ravindran, Scientist-S2 and Shri A. Vasanth Shenoy Scientist-S1 served as members in the Zone IV Manegement committee for sports.

GLEANINGS FROM OTHER JOURNALS

Indian Exports to U. S. touch a Billion Mark

Indian Exports to the United States touched US \$1 billion mark during the fiscal year 1979-80, as against US 986 million recorded in 1978-79—an increase of 12%. Some of the major commodities which registered increase in exports during 1979-80 over the previous year included jute, engineering goods, shell fish, tea spices etc.

—Indian Seafoods

Fishery Research Vessel

“R. V. Skipjack”, the first fishery research vessel built indigenously for the Central Marine Fisheries Research Institute, Cochin, was launched at Calcutta by Dr. E. G. Silas, Director of the CMFRI. The vessel is equipped with modern navigational and fishery equipment and sophisticated acoustic instruments.

The 107. ft. vessel was built at the Garden Reach Shipyard, Calcutta, based on Norwegian design. Dr. Silas

said at Cochin that the vessel would increase the capability of the CMFRI to conduct research and survey cruises in the Indian Ocean, the Arabian Sea and the Bay of Bengal.

The Vessel, which can stay at the sea for 24 days at a stretch can carry out different types of fishing operations including purse-seining for tuna in the high seas and deep-sea trawling and carry out acoustic surveys for estimating the fish stocks.

Simultaneously data would be collected on fishery oceanography and marine meteorology to get integrated Pictures of the resources and environment. The vessel has a laboratory and can accommodate five scientists besides the crew.

Purse - seine banned in shore waters

The Government has banned the use of purse seine and four other types of fishing gear within the territorial waters.

The other types are ring

seine, pelagic trawls, mid-waters trawls and bottom trawls.

Announcing this two news men, Revenue Minister P. S. Sreenivasan who is also in charge of fisheries, said that these gear could however be used outside the 22 km territorial water zone.

— Indian Express

Indian Marine Products in demand in S. E. Asia

Indian marine products have good demand in the South East Asian region and particularly in Hong Kong and Singapore, according to a market survey conducted by the marine Products Export Development Authority (MPE DA), reports UNIFIN.

The survey says as Indian marine products are concerned, there is an increasing demand for frozen items in Hong Kong. Any good looking fish in frozen form is acceptable to the Hong Kong consumers. Hong Kong market is prepared to pay attractive prices because of the high demand. Hong Kong annually imports about 10,000 tonnes of frozen fish.

CIFT Appointments

1. Shri K. J. Francis Xavier joined as skipper(T-7) at Headquarters, Cochin

2. Shri P. J. Joseph, Superintendent, was appointed as Asst. Administrative Officer at National

Bureau of Soil Survey and Land Use Planning Research Centre, Bangalore

Hong Kong is the second largest frozen shrimp importing country in the east. It annually imports about 17,000 tonnes and needs only second grade variety. The quality of Indian shrimp is accepted to be good but our prices are high. If prices could be brought down to competitive level India would be able to export about 10,000 tonnes annually. The country exported only 23 tonnes last year, the report adds.

The survey says Hong Kong which is the world's largest shark-fin market, imports about 39,000 tonnes annually. Indian shark-fins are well known among the importing countries but all of them have the same complaint that India cannot fulfil its commitments.

As regards Singapore, the survey says it is basically a fish importing country and regularly imports fish meal, crustaceans and molluscs. Part of the imports are re-exported to other countries.

Singapore is a traditional market for the Indian dried marine products. Occasionally, India also exports fish meal to Singapore.

According to the survey, India having the advantage of proximity will be able to complete effectively in the Singapore market with her fresh and frozen fish. The Singapore buyers are prepared to pay a higher price for similar items in frozen form. Singapore is the second largest fish meal importing country in the east and its annual imports are about 50,000 tonnes. India could supply large quantities of fish meal to this market if our production base is strengthened adequately, it adds.

- ECONOMIC TIMES

Marine Exports

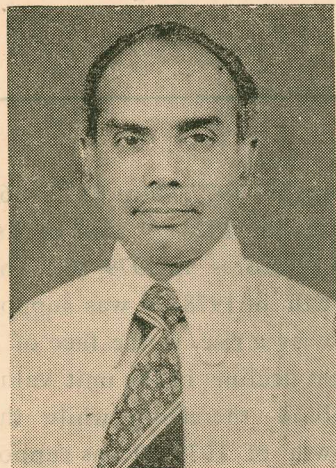
Export of marine products from India, consisting largely of shrimps, rose from Rs. 180.95

crores in 1977-78 to Rs. 234.62 crores in 1978-79 and to Rs. 248.82 crores in 1979-80. The growth of 1978-79 was supported by a rise in the face of a slight decline in the unit value realised therefrom while the growth of 1979-80 was supported entirely by a gain in unit value realisation. It had been expected that advantage would be taken of the sustained (though gradual) rise in unit value to export a larger quantum (somewhat over 86,000 tonnes in 1978-79 and in 1979-80) during 1980-81 to garner an export income of Rs. 300 crores. Available data, however, suggest a slippage from the target. During the first quarter, April-June, 1980, marine exports amounted to Rs. 48.24 crores against Rs. 73.23 crores in the corresponding quarter of 1979-80. It is of course possible to make up the Rs. 25 crore shortfall during the remaining three quarters of the year.

- Economic Times



K. KRISHNA RAO



The need to have reliable data on some important aspects of fisheries, is keenly felt many a time. The present availability of data in fisheries, is restricted to a few areas and in many others, either it is not available or is available only in scant or obsolete form. Shri K. Krishna Rao, a scientist in Statistics section of the F.I.S. Division(CIFT, Cochin), keeps this in view to obtain, if not exact, atleast reliable data on some of the technological aspects in fisheries, which might be useful in any programme in future.

Shri Rao joined Central Marine Fisheries Research Institute, Mandapam Camp, as Research Assistant(Statistics) in December, 1956. On selection by UPSC, he joined as Asst. Research Officer (Statistics) at CIFT, Cochin, in October, 1963. He was junior

Statistician in the Co-ordinated Research Project on 'Transportation of Fresh Fish and Utilisation of Trash Fish' from November 1971 to April 76, when he went on deputation to Pelagic Fishery Project (PFA) at Cochin, as Senior Biologist(Assessment). On termination of the deputation, he was reverted back to CIFT in September 1979 and at present is officiating as Scientist S-2 in Statistics.

Shri Rao had occasion to work on different areas in fisheries during the course of his twenty five years of official career. In the course of his duties at CMFRI, he was dealing with the estimation of marine fish landings in the maritime states, and with the statistical analysis and interpretation of biological data. At CIFT, he had research projects on statistical applications in quality control. He made a study of the ISI Standards on frozen shrimp and worked out criteria for modifications in the existing standards, and for the formation of pre-shipment inspection lots of frozen shrimp for the sampling inspection to be effective. On the Co-ordinated project, he was dealing with the economics of transportation of fresh fish between pairs of selected centres, in frozen and iced forms. At PFP he was associated with

the estimation of pelagic fishery resources in the Project area (Ratnagiri on the west coast to Tuticorin on the East Coast). He has participated in some of the cruises of the PFP Research vessels in this context. He was also on the team which undertook the aerial frame survey for estimation of fishing craft in the Project area. At CIFT, he is at present studying the pattern of utilisation of commercially important fish, as a component of which he is estimating the quantities of raw material received by the freezing factories at selected centres like Cochin, and the main sources of supply of such raw material.

Shri Rao was born in May, 1934. He received his earlier education at different places in Andhra and had his B.A. (Hons) in Mathematics from the University of Madras in 1954 and M.Sc. in statistics from Andhra University in 1956. He has published about twenty technical/research papers. He has visited the FAO head quarters at Rome during January-February 1979 in connection with the preparation of the project report of PFP.

CIFT is at your Service

It transfers Fishery Technology by way of:

- ◆ Demonstrations of Fishing and Fish Processing techniques evolved by it
- ◆ Answering Technical queries
- ◆ Supplying project reports and design drawings
- ◆ Training courses of fishing and fish processing

Please contact:

Director,
C. I. F. T.,
Matsyapuri P. O.,
Cochin - 682 029

