



# CMFRI newsletter

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## Artificial Breeding and Rearing of Pearl Oyster- Another Breakthrough in Mariculture



*Pearl culture team at work*

Thousands of spat (young ones) of pearl oyster (*Pinctada fucata*) have been produced for the first time through spawning and rearing of larvae under controlled conditions at CMFRI's Research Centre at Tuticorin. This follows one of the significant achievements of CMFRI in 1973 in developing the technique for production of cultured pearls entirely by indigenous efforts.

One of the major constraints in the development of pearl culture as an industry in the country is the paucity of adequate pearl oyster population in the natural beds of Gulf of Mannar and Gulf of Kutch. Using the technology developed now pearl oysters can be produced on a large scale in hatcheries which can supply mother oyster stock to pearl culture farms. This re-

duces the dependence on natural stocks for farm production of pearls. With this the Institute has the total technology range for controlled production of good quality pearls.

The present breakthrough has been achieved through concerted team effort by Dr K. Alagarwami, Shri S. Dhar-

*(Continued on page 3)*

## TIGER-PRAWN HATCHERY FACILITY NEAR MADRAS

A Hatchery for large-scale production of the seed of tiger-prawn *Penaeus monodon* is being developed at Kovalam near Madras by CMFRI. The tiger-prawn is a high-priced species much in demand for export. But the production of this species from the marine capture fisheries is very low compared to other penaeid prawns. *P. monodon* is relatively more abundant along the east coast in the States of Tamil Nadu, Andhra Pradesh, Orissa and West Bengal compared to the maritime states on the west coast.



For the first time, in the experimental hatchery at Kovalam, the CMFRI scientists have succeeded in breeding the tiger-prawn and rearing the larvae to stocking size. Initially the spawners were collected from the wild for the production of seed. It has now been possible to build up a broodstock in the laboratory itself by adopting unilateral eye stalk ablation. Two batches of breeders have been developed by this process and the larvae have been reared through various stages by feeding them with appropriate planktonic organisms mass cultured in the laboratory.

The success achieved in hatchery production of tiger-prawn seed has immense prospects for increasing production of this highly valued species through culture. CMFRI has accomplished this through a crash programme at its Kovalam Laboratory. In spite of the priority assigned by the States and the interest shown by

*Shri P. Gangadharan Farmer from Nagapattanam receives the first consignment of P. Monodon seeds from Shri. Lakshmikanth an Barathi, IAS, Commissioner and Secretary, Forest and Fisheries Government of Tamil Nadu*

entrepreneurs as well as small and marginal farmers, prawn culture is yet to make a mark in terms of production. One of the major constraints has been the uncertainty of seed availability in the wild. CMFRI has developed hatchery facilities for the white prawn *P. indicus* at Narakkal near Cochin and would concentrate on *P. monodon* hatchery at Kovalam on the east coast, both in view of the natural abundance of the species and also the suitability of the ecosystem for its culture. These two facilities would act as centres for the transfer of hatchery technology both to the States and private sector and also to fishermen co-operatives.

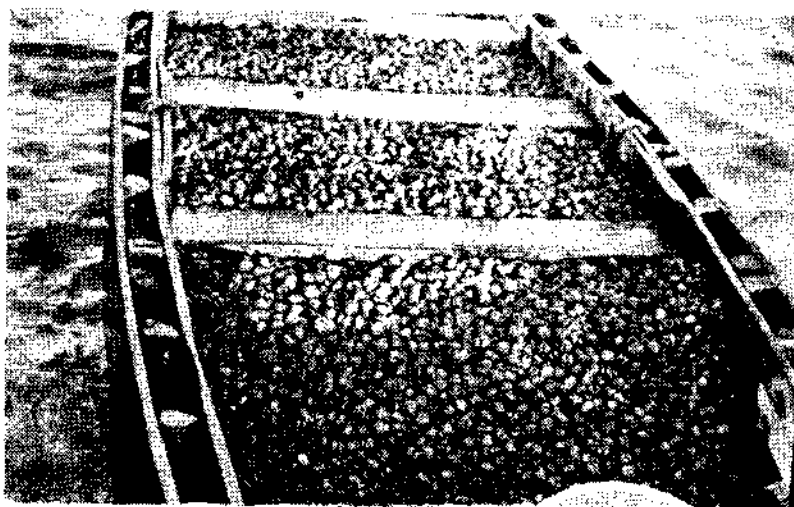
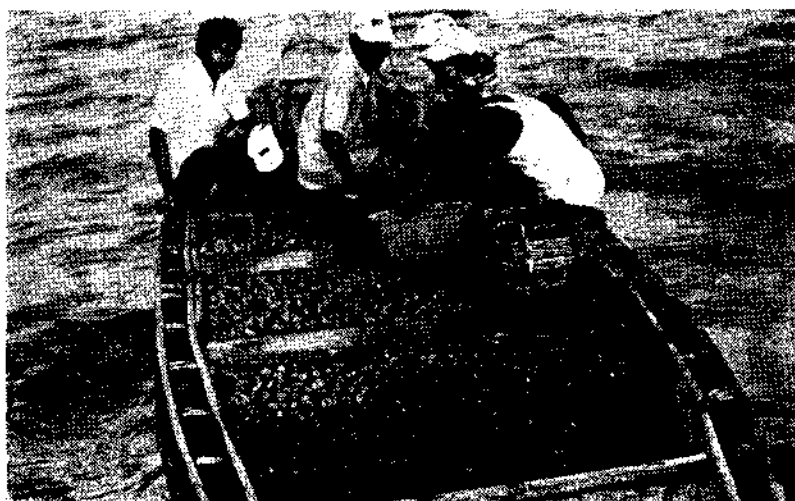
The brackishwater area of 93 acres in Muttukad including

the Kovalam backwater area handed over by the Tamil Nadu Government to CMFRI would be developed into a major R & D centre for mariculture. When the facility is fully developed it would form a useful farm service centre for the fish and prawn farmers of the State on the eastern seaboard of India. A beginning has already been made by free supply of *P. monodon* seed to a farm at Nagapattanam in July and the feed back data are being obtained. The prawn culture team consisting of S/Shri K. Devarajan M. Kathirvel, N. Neelakanta Pillai and S. Kulasekhara Pandian under the leadership of Shri K. H. Mohamed, Scientist S-3 of CMFRI has been working hard for the last three months to achieve this breakthrough.

## Technology For Blood Clam Culture

Simple techniques for collection of blood clam seeds (*Anadara granosa*) and transplanting them in the subtidal mud flats of Kakinada Bay have been developed at the Kakinada Research Centre of CMFRI. Kakinada Bay provides favourable condition for the growth of clams and blood clams have been cultured there successfully for the third time with high production rate.

Seed clams of 17.8mm average length and 2.474g. average weight were stocked at the rate of 300 clams/m<sup>2</sup> in 0.16 hectare farm at Kakinada in first week of April. At harvest in the last week of October, after a growth of seven months, clams measured 41.8 mm in length and 30.63 g in weight. The survival rate was 41.65%. A high production of 6.1 tonnes was obtained from 0.16 hectare. The meat formed about 20% of the weight.



*Freshly harvested clams*

(Continued on page 1)

maraj, Shri A. Chellam, Shri A. C. C. Victor and Shri T. S. Velayudhan, Scientists and Shri A. Deivendra Gandhi, Technical Assistant working in the hatchery for the last three years. Dr K. Alagarwami, received the Hari Om Ashram Trust Award in 1979 for developing the techniques for production of cultured pearls for the first time in India.

A major problem in the artificial production of seed was the identification, culture

and determination of feeding dosages of microalgal food organisms for different stages of pearl oyster larvae and this has been successfully worked out. In 22 days from spawning, settlement of spat has taken place and this period could be

reduced by further control of environmental factors and feeding. CMFRI is intensifying researches on these aspects to develop a blueprint and conduct production trials for settling up a large-scale pearl oyster hatchery in the country.

*Anadara granosa* belongs to the family Arcidi and is popularly known as blood clam owing to its red colour flesh due to haemoglobin pigments. The clam is eaten locally to a limited extent. The clam shell is used for production of lime. The species has food value in South East Asian Countries like Malaysia and is traditionally cultured therewith a production rate of 20.7 tonnes per hectare per year.

In clam culture fertilizers and feeds are not used and the investment is very low. The clams sell at Rs 140 per tonne in local market and even at this price the cost-benefit rate is very encouraging.

The clam culture project at Kakinada is handled by Shri K. A. Narasimham, Scientist S-2 and his associates.

### Frozen Clams Exported

For the first time, the private industry has exported frozen clams (backwater clam, *Villorita*) worth about 20,000 dollars to Japan. It is learnt that about 18 tonnes of clams have already been exported and an order for 30 tonnes more is pending with the exporter. This is a breakthrough in diversifying the marine products exports and for the first time clam has entered the market. There are indications that the clam export will pick up and the resource will come under increased pressure of exploitation for meeting the export demand. Clam being a sedentary resource there are possibilities of irrational exploitation. Intensive culture of blood clams with the technology developed at CMFRI will help to maintain the balance to certain extent.

### Marketing Prospects for Edible Oyster

CMFRI has succeeded in getting assistance of the Integrated Fisheries Project (IFP) at Cochin to lift the oysters for processing and sale under its programme of development of diversified products. The IFP had earlier made an economic feasibility study based on the samples supplied by CMFRI. The IFP has taken one tonne of oyster meat at a cost of Rs 15,000 and thus a good beginning has been made in marketing of edible oyster in the country. With the success in IFP's promoting this product it would be possible for the oyster farmers to extend the area under culture and also establish an oyster culture industry in the country.

The technology for culture of edible oysters has been developed at CMFRI and has been transferred to the fishermen in Tuticorin under the Lab - to - Land Programme. CMFRI had arranged demonstrations, retail sale and supply to starred hotels and also participated in the International Seafood Trade Fair at Madras in 1981. Being a nonconventional product CMFRI faced problems in finding out ready market.

### Grey Mullet Fertilized

Artificial fertilization of *Liza macrolepis* has been achieved through hypophysation. The female administered with pituitary hormone injections showed development of eggs up to ripeness but did not spawn naturally. Some eggs were stripped and were artificially fertilized with milt. The

larvae were reared for a week. However, mortality occurred on the fourth day which is critical to mullet larvae rearing. With improvements in water management system and larval feeding it would be possible to spawn and rear the larvae of grey mullet to stocking size.

The above work on mullet breeding is being carried out at Mandpam Regional Centre of CMFRI by Shri G. Mohanraj, Shri A. Raju and Shri V. Gandhi, Scientists S-1 and Shri V. Rangaswamy, Scientist S under the guidance of Dr P. S. B. R. James, Joint Director of the Regional Centre.

### Female Eel Spawned in the Laboratory

Indian short-finned eel, *Anguilla bicolor bicolor* was made to spawn in the laboratory through repeated hormone injections. The eel reached spawning condition and released some eggs 75 days after the first hormone injection. Five days after partial spawning the eel died. Even though the experiments were also started with male eels simultaneously none of them responded to the injections and hence artificial fertilization could not be attempted.

The length of the eel remained constant during the period whereas the weight increased by 6.3%, eye index by 35.6% and pectoral length by 38.9%. The GSI value of the eel at death was 48.1%. The left ovary was found to be longer and heavier than the right ovary. The eggs were spherical, fully transparent and measured approximately 0.9mm in diameter in fresh condition.

It was noticed during the experiment that continuous administration of hormone is necessary for inducing gonadal development in the eel. If at any time the injections are suspended further development in the gonad does not take place. In some cases process of reabsorption in the developed gonads sets in at early stage of maturity.

### **Trial Export of Indian Cultured Eels**

CMFRI assisted MPEDA in its effort to explore export market potential for Indian cultured eels in Europe. Eel cultured from elver stage at the Mandapam Regional Centre of CMFRI, were supplied to MPEDA for processing and product development for trial exports to Europe. If an export market develops based on the current and future efforts of MPEDA, the techniques of eel culture in running water system developed by CMFRI would find application for commercial production.

### **Remote Sensing - Second Phase of Experiments Completed**

The Joint Experiments Programme on remote sensing for fisheries conducted another experiment off Cochin during 21-24 October where CMFRI, Space Application Centre and Exploratory Fisheries Project participated. The experiments were conducted coinciding with the overpass of the satellites LANDSAT and NIMBUS 7. The research and exploratory fisheries vessels took part in the seatruth data collection.

Scanning of chlorophyll was done from the air craft through Ocean Colour Radiometer. Further experiments have been planned for November and December. The data collected from these programmes will be useful in planning of remote sensing technology in fisheries and evaluating the type of sensors to be used by the Indian satellite to be launched in 1985.

### **Destructive Fishery for Catfish Stocks**

The purseine fishery along the Dakshina Kannada coast has, for the second year in succession, started exploiting catfish resources unjudiciously since 29 September. The male catfish in the exploited fishery were in the stage of incubating eggs. Capture of such incubating fish could lead to large-scale destruction of catfish resources. It has been estimated that between 0.4 and 2.9 tonnes of catfish eggs are destroyed by the purseine fishery of Mangalore. A similar situation was observed last September when 37 tonnes of catfish eggs were destroyed. The attention of the Department of Fisheries and Government of Karnataka and also the Department of Agriculture in the Union Ministry of Agriculture has been drawn to take appropriate action. CMFRI has been closely monitoring the purseine fishery to obtain detailed information.

### **Heavy Landings of 'Jumbo-flower' Prawn**

An unusually heavy landings of prawn *P. semisulcatus* was observed at Verval during

October. Of the total catch of 88.4 tonnes of penaeid prawn *P. semisulcatus* formed 62% of the trawler landings at this Centre. Boats operating in 60-80 m depth zone yielded better catch. *P. semisulcatus* is a large-sized prawn and commands a premium price in export market. This species has not contributed much to the prawn fishery off the Gujarat area so far. Factors contributing to this successful fishery are being studied based on biological and catch data

### **Oil Sardine Landings off Bombay—An Unusual Phenomenon**

An estimated 28.6 tonnes and 17.5 tonnes of oil sardine (*Sardinella longiceps*) were landed respectively by trawlers operating off Murud (South Bombay) and by dol nets operating at Khandara (North Bombay). The size range of the oil sardine was 16.2 - 20.8 cm. The capture of oil sardine off Bombay is unusual as the northern limits to the regular fishery for this species is Ratnagiri. A moderate fishing was noticed off Worli by cast nets and the fish were smaller (6.5-10.5 cm). The oil sardine fishery which was observed for a short while during the second week of October showed decline from the next week.

Duration of the Training in scientific fish/prawn farming at KVK has been extended to 20 days considering the various practical work included in the course.

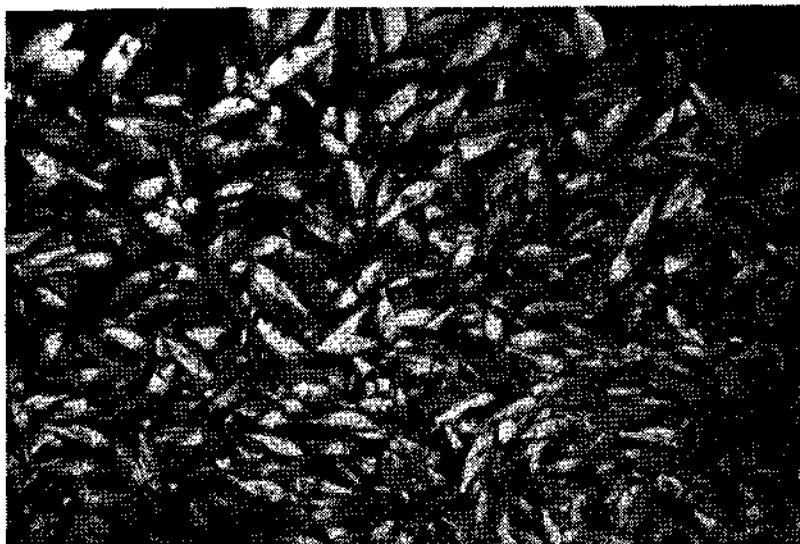
## MUD BANK FISHERY OF ALLEPPEY-THOTAPALLY REGION

The periodic formation of mud banks along the Alleppey-Thotapally coast of Kerala takes place with cyclic regularity in the inshore areas during the south west monsoon reducing the wave action in the sea considerably on an otherwise surf-ridden coast. They provide safe anchorage for fishing crafts and the water in their environs remains calm facilitating good fish catch even while the roughest weather prevails and sea is very rough in the surrounding areas. The topography and the presence or absence of mud banks influence the fishing operations during south west monsoon months. The fishermen from the neighbouring centres congregate there for fishing operations.

During the 1981 monsoon fishing season, a special survey team of scientific and technical staff of CMFRI was deployed for the collection of catch statistics in the Alleppey-Thotapally mud bank region from 20 July to 31 August. The centres covered during the survey were Punnappa North (Parur) Punnappa South, Punnappa Central, Thotapally, Chennangara, Vandaman, Kurusupalli, Ambalapuzha, Kakazham, Neerkunnam, Pallana, Punthala and Purakad. The data on species-wise catch, effort and length-frequency of commercially important fishes like oil sardine, mackerel and prawns were collected on each day of observation as per the specially designed sampling method. The night landings data were also



*Off to the mud bank—fishing vessels leaving the harbour*



*A good catch*

collected by local enquiry. The survey team camped in the Alleppey-Thotapally region and intensive survey was conducted on all aspects of mud bank fishery. The information on the number of fishing boats fitted with outboard engine that were employed in the mud bank fishing, the number of fishing trips made by the fishing crafts and the catch per boat was also collected.

The information on the percentage of prawns that went for processing, drying and local market from each landing centre, the names of companies that purchased prawns, the number of boats that had come from outside Alleppey-Thotapally region for mud bank fishing and the price statistics of important fishes were also collected. The data collected are being analysed centre-wise. The report will be published in the MFIS

The survey work was organised by the Fishery Resources Assessment and the Fishery Environmental Divisions of CMFRI

### **Cyclone Hits Sourashtra Coast**

A cyclone crossed between Veraval and Porbunder in the early hours of 2 November inflicting loss of lives and heavy damages to property in the fishing towns/villages of Junagadh district. The port towns of Veraval, Porbunder and Mangalore were the worst affected. An estimated 12 boats were totally lost, 334 boats were damaged and 8576 units of fishing gear were lost. The total loss/damage in the fishing villages of Junagadh district has been estimated to be



*Ready for disposal*



*At the curing yard*

*(Continued on page 8, Col. 3)*



## Paddy harvest in Lab-to-Land Programme

Under the Lab-to-Land programme at AMSF Harijan Society at Valappu, cultivation of 'Pokkali' paddy was taken up as interim crop during south-west monsoon. The seedlings were planted in July this year in an area of 0.6 hectre and harvest was taken in October. A substantial yield of 2,000 kg of paddy worth Rs 3000 was taken. The production is one of the highest for this paddy variety in brackish water land area of this region. The harvested paddy was distributed to the 136 members of the Society for their domestic consumption. In the Harijan Society farm prawn culture and integrated farming has been showing promising results and it will very soon become an economically viable farm unit.

One important feature of paddy cultivation is that, for the first time 'Pokkali' variety of paddy was cultivated along with finfishes (*Mugil spp*, *Chanos chanos*, *Etropolis suratensis*); marine prawn (*P. indicus*) and giant freshwater prawn (*Macrobrachium rosenbergii*). The harvest of these species of prawns and fishes could be conducted in due course.

## Survey of Paddy Field

A survey of the traditional prawn farming system of Vypeen Island in Cochin was conducted by the CMFRI's Krishivigyan Kendra at Narakkal.

## Coconut Seedlings Planted at Valappu

Seventy-five numbers of coconut seedlings received



*Dr E. G. Silas, Director inaugurating paddy distribution*

from the Central Plantation Crops Research Institute, Kasaragod have been planted in the

bunds of prawn farms under the Lab-to-Land Programme at Valappu.

## TRAINING COURSE IN MUSSEL CULTURE

A short term training course in mussel culture has been started at the Karwar Research Centre of CMFRI. The course was inaugurated on 14 December by Shri. I. Devendran, IAS, Project Director, Rural Development Society, Karwar. Shri P. M. Tandel, Chairman North Kanara District Cooperative Fish Marketing Union, Karwar presided over the meeting.

The training will be offered in three phases of two weeks each. First phase of the training was conducted during 14-26 December. The second phase of the training will be conducted in February 1982 and the third phase in May 1982. The entire curriculum of training is practical and field oriented and will include biology, culture technology, farm maintenance and post-

harvest technology of mussel. It is for the first time that training course in mussel culture is offered in India.

CMFRI has developed the techniques for the farming of green mussel (*Perna viridis*)

*(Continued from page 7)*

around Rs. 45.6 lakhs. Fish production from these centres has been affected. The state Government has taken steps to ameliorate the cyclone-stricken fishermen.

## Cadalmin IV

Cadalmin IV allotted for Tuticorin Research Centre of CMFRI reached Tuticorin on 12 December. Specific fishing programme for the vessel is being drawn up involving participation by scientific staff of various divisions of CMFRI.



and brown mussel (*Perna indica*) and high production rates have been achieved for both the species. CMFRI has conducted Lab - to - Land transfer of technology programme in mussel culture at Calicut and Madras and there are on-going programmes at Karwar. To further the interest of mussel culture development in India, CMFRI has organised this training course, particularly for the benefit of the department of fisheries of maritime States. For the present course, the States of Gujarat, Karnataka and Andhra Pradesh have deputed officers for training.

The following officers are undergoing training in mussel culture at Karwar.

Shri Harish B Supt of Fisheries, Mangalore, Karnataka

Shri B. Dave, Senior Research Assistant, Fisheries Department, Jodhpur, Gujarat.

Shri R. R. Pathak, Senior Research Assistant, Fisheries Department, Port Okha.

Shri Y. Balaramaiah, Inspector of Fisheries, Nellore, Andhra Pradesh.

Shri D. Nagaraj, Field Assistant, Mangalore Research Centre of CMFRI, Mangalore.

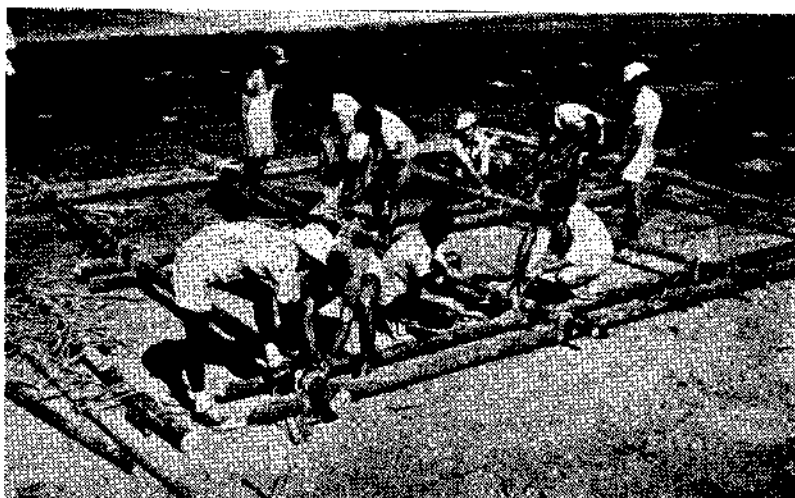
Shri VVSPRU Prasad, Research Assistant, Fish Farm, Andhra Pradesh.

Shri C. Somasekharan, Assistant Director (Mariculture), Karnataka.

Shri M. H. Dhulkhed Officer-in-charge, Karwar Research Centre is overall in-charge of the training course and Dr P. S. Kuriakose is the Scientist-in-charge of the technical programme. Other scientific and technical staff are assisting in the conduct of the course.



*Shri P. M. Tandel delivering presidential address*



*Trainees fabricating the raft*



*The culture rope being seeded*

## VISITORS

### FAO Mission

The FAO Mission consisting of Dr J. P. Troadec, Chief, Fisheries Development and Planning Service, FAO Rome and Dr H. D. Ranga Iyengar, Senior Officer, Trust Funds Operations Services, Fisheries Department, FAO Rome visited Cochin from 15 to 18 September. The Mission came to India at the invitation of the Government of India to discuss management of fisheries of Exclusive Economic Zone of India. The objective of this Mission was to identify the areas in which FAO could be of assistance and to draw up the terms of reference and composition of a larger mission which could come to India at a later date for about six to eight weeks duration to make detailed studies.

Dr E. G. Silas, Director of CMFRI chaired the meetings held on 15 and 17 September at CMFRI which were attended by the Members of the FAO Mission. Dr. C. C. P. Rao Director, Central Institute of Fisheries Technology, Shri. K. M. Joseph, Director Central Institute of Fisheries Nautical and Engineering Training, Shri R. Sathiarajan Director, Integrated Fisheries Project, Dr S. V. Bapat, Joint Director and Shri K. H. Mohamed, Dr K. Alagaraswami and Shri T. Jacob Scientists of CMFRI also attended the meeting.

The Mission visited the various fisheries organisations at Cochin including the CIFNET, IFP, CIFT, EFP and CMFRI and held discussions with the Chairman of Marine

Product Export Development Authority.

### IFAD Mission

Prof. George R. Allen, Newton Tracey, Devon England who is a Consultant for the International Fund for Agricultural Development (IFAD), accompanied by Shri Arjun Thapan, Under secretary (Fund Bank Division) Department of Economic Affairs, Ministry of Finance, Government of India, visited Cochin from 22 to 24 September. Prof. Allen had come on an identification mission to examine certain proposals given by the Government of India and to submit a feasibility report to IFAD for taking up specific projects with IFAD assistance.

A meeting with the Mission was held on 22 September at CMFRI Cochin. Dr E. G. Silas, Director CMFRI, Chaired the meeting. Dr R. Raghu Prasad, Emeritus Scientist, Dr S. V. Bapat, Joint Director, Shri K. H. Mohamed and Dr K. Alagaraswami, Scientists of CMFRI; Shri M. K. Pavithran Deputy Director and Shri S. Ravindran Nair, Fisheries Department, Kerala attended the meeting. The Mission showed keen interest in two specific areas, development of brackish water prawn culture and provision of mechanised boats. The mission evinced interest in establishment of prawn hatcheries, construction of prawn culture ponds and making them available to small fishermen and landless labour and advisory and extension service in brackishwater prawn culture. The Mission visited the Lab - to - Land programme of CMFRI

at Valappu, Krishi Vigyan Kendra on Mariculture of CMFRI at Narakkal and had a brief chat with the trainees. Prof. Allen was very much appreciative of the concept of adopting a Harijan Society consisting of over 130 families as a whole and assisting them in prawn culture. He was also impressed by the prawn production already achieved in the farm during the last two years and the integrated programme combining paddy, coconut and vegetable cultivation. After visiting the prawn culture Laboratory of CMFRI at Narakkal, the Mission left for Azhikode to see the Regional Shrimp Hatchery of the Fisheries Department of Kerala.



*Mrs Ajana*

Mrs Agnes Ajana, Principal Research Officer, Nigerian Institute for Oceanography and Marine Resources, Nigeria was at CMFRI from 24 October. Mrs Ajana gave a talk on Nigeria and Nigerian Fisheries.

### **Bay of Bengal Project Team Impressed by Resource Assessment Work**

An FAO team consisting of Dr S. C. Venema, Fishery Resources Officer of FAO and Mr Bergestran of UNDP, Bay of Bengal Project visited CMFRI during 19-21 November. The mission of the team was to have detailed discussions and to collect information on fisheries development and management in the Exclusive Economic Zone, in connection with the proposed Bay of Bengal project on promotion of Fishery Development and Management in the Bay of Bengal for discussion at Bengal Committee meetings at Colombo in November.

The team was very much impressed with the work done at CMFRI particularly in the area of collection of catch statistics and associated data in estimating marine production and assessment of fish stocks.

Shri Francisco Sardinha, Minister for Agriculture Government of Goa accompanied by the Directors of Agriculture and Animal Husbandry, Goa visited CMFRI on 23 October. The Minister was impressed by the integrated farming system combining prawn culture with paddy, coconut and vegetable cultivation under the Lab-to-Land Programme. The Minister also visited the Prawn Culture Laboratory and Krishi Vigyan Kendra at Narakkal.

A team from Ministry of Agriculture, Forests and Irrigation Lao, PDRY consisting of following persons visited Mangalore Research Centre of CMFRI.

Mr Singsounha Pengke, Head of Fisheries, Directorate of Livestock, Lao.

Mr Thongsa Xaisanl, Chief of Livestock and Veterinary Division, Pakse Province.

Mr Phitsarath Ouday, Manager, State Farms, Vietiane Province.

Mr Sourya Bounxu, Manager, State Farms, Savansaket Province.

Mr Phommasone Phemma, Chief of Veterinary Division, Luangprabang Province.

Mr Thoomphavanh Chanty, Assistant Chief of Agriculture Division, Xam Neua Province.

Dr O. P. Gautam, Director-General and Dr R. M. Acharya, Deputy Director - General (Animal Sciences), ICAR visited the Madras Research Centre of CMFRI on 27 October and had discussions with Officer-in-charge and Senior Officers.

Shri Sujan Singh, Member of Parliament and Member of Governing body of ICAR visited Bombay Research Centre of CMFRI on 5 July.

Shri K. Lakshmi Kanthan Bharath, IAS, Commissioner and Secretary to Government, Forest and Fisheries Department accompanied by Director of fisheries, Tamil Nadu visited Field Laboratory at Tuticorin, 21 August.



*Shri. Sardinha at Valappu with CMFRI staff*

### **Expert Consultant on Fish Nutrition**

Dr Akio Kanazawa, Professor, Faculty of Fisheries, Goshima University, Japan is working as an Expert consultant in Fish and Shell Fish Nutrition at the CAS in Mariculture CMFRI, Dr Kanazawa will be at CMFRI for 8 weeks from 26 November.

The following persons also visited different Centres of CMFRI during the period.

Line Gery, French Consortium to the Fisheries Development, France.

Dr C. C. Panduranga Rao, Director, CIFT, Cochin.

Shri P. K. Thomas, Director, CTCRI, Trivandrum.

Dr T. J. Varghese, Professor of Aquaculture, College of Fisheries, Bombay.

Shri G. Secunder, Professor of Zoology, Mercy College Palghat.

Shri A. S. Nagaraj, College of Fisheries, Mangalore.

Shri N. M. Kamat, Headmaster, Popular New English School, Chendia, Uttar Kannada.

Students of Regional College of Education, (NCERY) Mysore.

Professor P. D. Deodhar, K. J. Somayya College, Bombay.

Shri P. V. Arvi, Lecturer in Zoology, Christ College, Bangalore.

Dr Anant Saraya, Brackishwater Fisheries Division, Department of Fisheries, Ministry of Agriculture and Co-operatives, Bangkok.

Ka Samsart Chalayondesja, Senior Fishery Biologist, Brackishwater Fisheries Division, Bangkok.

Captain A. K. Mehra and Captain O. A. Nair, Indian Navy Coast guard.

Shri F. J. Vaz, Commissioner and Secretary, Forests and Fisheries, Tamil Nadu.

Y. R. Runov, Vice Consul, USSR Consulate, Madras.

Shri T. E. Sivaprakasam, Joint Director, Exploratory Research Project, Bombay.

Ten candidates for the award of Senior Fellowship under Ph. D programme for the year 1981-84 and 12 candidates for the Junior Fellowship under the M. Sc programme for the year 1981-83 have been

selected under the CAS in Mariculture, CMFRI

The Academic council of the University of Cochin has approved regulations for the Degree of M. Sc in Mariculture under the CAS in Mariculture, CMFRI (*vide* University Gazette notification No AC. B3 Rhlns/81 dt 24 January, 1981).

Madras University has recognised Madras Research Centre of CMFRI for conducting research leading to Ph. D programme of the University subject to the fulfilment of the usual conditions.

Dr B. Krishnamoorthy and Dr E. Vevekanadan Scientists have been recognised as Research Guides by the Madras University for conducting research leading to Ph. D at Madras Research Centre of CMFRI.

### **CMFRI Headquarters Building Sanctioned**

A Sanction of Rs. 256.52 lakhs for the construction of the Headquarters Laboratories at Cochin has been received by CMFRI. The pile foundation work for the building has already been completed. The present sanction is for five storeys. CMFRI offices and laboratories at Cochin are at present located in rented commercial and residential buildings. Construction of its own laboratories will facilitate greater turn over and improvement of work quality.

The XXVI meeting of CMFRI Staff Research Council was held on 28 September. The meeting was presided by Dr E. G. Silas, Director of CMFRI. Dr P. R. S. Tampi, Assistant Director-General (Fisheries), ICAR was also present.

### **Zonal Workshop Of The FRAD Field Staff**

The Zonal Workshops of the field staff of Fisheries Resources Assessment Division of CMFRI posted in the various maritime states of India were held at Cochin, Karwar, Bombay, Madras and Waltair during October-December. The purpose of the workshop was to explain to the field staff the method of giving codes for various types of data collected in the landing Centres in respect of species-wise catch, effort and price statistics which are to be furnished in various fishery survey forms devised for this purpose. The coding of the data is being done as a prelude to computerisation of the same for quick dissemination.

In this connection, the list of landing centres which forms the frame was updated on the basis of the recent census. Similarly the names of various types of fishing crafts and gears were updated for giving the codes to them. At these meetings, region-wise lists of commonly occurring fishes were finalised. Refresher courses were conducted in identification of fin and shell fishes and the method of collection of catch data.

The difficulties faced by the field staff in respect of collection of data in the landing centres as well as their personal problems were discussed.

# STAFF NEWS

## Deputation

Shri S. Mahadevan, Scientist S-2 was deputed to undergo advance training in Fish Diseases under FAO/UNDP training programme at the Virginia Institute of Marine Sciences, Marine Laboratory, Aberdeen and in the Institute of Aquaculture, University of Stirling for a period of 3 months from 8 September.

Shri S. Mahadevan, also proceeded on deputation to USA and Scotland for training under FAO/UNDP Programme.

Shri K. Nagappan Nayar and Dr P. Vedayasa Rao Scientists S-3 participated in the World Conference on Aquaculture and International Aquaculture Trade Show at Venice, Italy from 21-25 September and visited fisheries research laboratories in Italy, Spain and France under FAO/UNDP training programme for observation and study tour, September-November.

Dr M. J. George, Scientist S-3 was deputed to attend the Workshop on the Scientific Basis for the Management of Penaeid Shrimps at Key West, Florida, USA, 18-24 November.

## Officials of CMFRI attended the following meetings

Dr E. G. Silas, Director attended the following meetings.

Discussion with the Hon'ble Minister for Agriculture, Seychelles relating to setting up of fisheries corporation as instructed by Director, DARE at Bombay, 3 August.

Central Board of Fisheries Meeting at Delhi.

Expert Committee Meeting of R. V. SKIPJACK at GRSE Calcutta.

The Meeting of the Technical Advisory Committee on new and renewable sources of energy Department of Science & Technology at Madras, 1 July.

The Second Meeting of the Expert Panel for Living Resources Programme at Madras, 2 July

Parliamentary Consultative Committee Meeting at Delhi.

Meeting convened by Hon'ble Minister of Fisheries and Forests to discuss Kerala Fisheries Ordinance and connected issues at Trivandrum.

Fourth Meeting of the Task Force for Marine Products set up by the Ministry of Commerce, Government of India at Delhi, 25 July.

FAO Advisory Committee of Experts on Marine Resources Research (ACMRR) at Rome, 2-6 November.

Third Management Committee Meeting of the Operational Research Project at Madras, 26 November.

XXIV Meeting of the General Council and 108th Meeting of the Executive Committee of the Kerala Agricultural University at Trichur, 28 November.

## Dr E. G. Silas has been nominated as:

Member on the Sub-Group on Coastal Area Planning of the Task Force to Prepare the Eco-Development Plan for the Goa set up by the Planning commission.

Representative of ICAR & DARE on the MPEDA.

Participant in the Marine Resources Survey Programme on ICUN and Department of Environment team visiting Andaman & Nicobar for Marine Resources survey.

Member of the National Committee for Scientific Committee on Oceanic Research (SCOR) for 1981-84 under the chairmanship of Dr S. Z. Qasim, Department of Environment (Government of India) by Indian National Science Academy, New Delhi.

Member, Nominated by ICAR in the Management Committee Section of Krishi Vigyan Kendra, Mitraniketan Vellanadu, Trivandrum for a period of 3 years from November, 1981.

## Advisory Committee on Marine Research

Dr E. G. Silas, Director CMFRI, represented India as member at the Tenth Session of Advisory Committee of Experts on Marine Research (ACMRR) of FAO held at Rome during 2-6 November. The session discussed the following items (1) Promotion of fishery research in developing countries (2) Research aspects of fishery management (3) New law of the sea (4) Study of country needs (5) Environmental aspects of fishery research (6) Aquaculture (7) Review of activities of other working parties and related matters. (8) Matter referred to the committee. Some of the areas discussed and recommendations made are: close interaction between University group (to tackle more theoretical studies) and fishery institutes and FAO (to examine ways of

fostering such collaboration); continuous review and close feed back between the users and the scientists, so that they later adopt their methods and line of study to local needs; FAO to arrange to study the impact of research on the development and socio-economic performance of fisheries through number of case studies, possible establishment of International Institute of Fishery Management which could help strengthen regional capacities and training of fishery managers; administrators and instructors; production of manuals and regional fisheries journals; holding a World Conference on fishery management; development of relevant socio-economic information to guide decision making on fisheries management and development, advancement in scientific understanding of the effects of environmental variability on fish production, and review of the need for special ACMRR-sponsored group on accounting research to be made at the 1982 Bergen Symposium on Fisheries Accounts.

The following working parties have been recommended to be constituted

1. Working party on Aquaculture
2. Working party on the principles of Fisheries Management in the New Ocean Region
3. Working party on Living Resources Management of Fisheries in Nearshore, Tropical waters.

Dr. E. G. Silas has been proposed to chair the working

party three and other Indian scientists have been proposed to work as members in other working parties.

Shri R. Dorairaj, Superintendent was deputed for Refresher Inservice Training Course for Section Officers and Equivalents at the Institute of Secretarial Training and Management, New Delhi, 5 October-13 November.

Dr P. S. B. R. James, Joint Director, Mandapam Regional Centre of CMFRI participated in IV workshop of All India Coordinated Research Project (ICAR) on Brackishwater Fish Farming at Kakinada, 24-25 October.

Shri M. Srinath and Smt. Krishna Srinath Scientists S-1 attended India International Trade Fair at New Delhi, 14 November - 4 December.

Dr Ramamoorthy, Scientist S-3 attended the State Level Committee for Coordination of Marine Fisheries Work at Bombay on 18 November. Dr Ramamoorthy is the Member Secretary of the above Committee.

Dr K. Radhakrishna, Dr T. Appa Rao, Shri Appanna Sastry and R. K. M. Nair, participated in the Bay of Bengal Programme meeting at the invitation of Fisheries Department at Waltair, 27 November.

Scientists of Waltair Research Centre attended the meeting on Oceanographic Research organised by Dr E. G. La Fond at Andhra University, 16-17 November.

A talk on 'A general review of marine wealth and status

of fish industry of India and prospects of marine wealth and conservation of fishery resources in India' was given by Shri P. T. Meenakshisundaram, Scientist S-2 in the training course by Export Inspection Agency Training and Documentation Centre, Madras.

Dr B. Krishnamoorthi, Shri P. T. Meenakshisundaram, Shri Girijavallabhan and Smt. Geetha Bharathan attended the Seminars on Algae and their Utilisation at Madras University.

Dr B. Krishnamoorthi, gave a talk on Management of Fishery Resources under the auspices of Agricultural Refinance Development Corporation, Madras, 11 December.

Shri V. M. Deshmukh, Scientist S-2 attended Seminar on the Management of Indian Exclusive Economic Zone organised by the Central Institute of Fisheries Education, Bombay, 16 December.

Shri N. S. Radhakrishnan, Shri J. C. Gnanamuthu, Dr T. Appa Rao, Shri S. Ruben and Shri P. Sam Bennet Scientists S-1 attended the Sixth Orientation Course in Agricultural Research Management at National Academy for Agricultural Research Management, Hyderabad from 1 December.

Dr K. Satyanarayana Rao, Officer - in - charge, Mangrove Research Centre of CMFRI attended the meeting of officers and scientists of Central Government, State Government and University of Agricultural Sciences convened by the University of Agricultural Sciences

## Appointments

Shri D.C.V. Easterson as scientist S-2 under CAS, Cochin, 2 July.

Dr Paul Raj, as Scientist S-2 (Animal Nutrition) under CAS, Cochin, 9 September.

Shri K. V. George, Senior, Technical Assistant (T-6) at K V K, Narakkal as Technical Officer (T-7) under C A S, Cochin, 18 July.

Shri B. S. Ramachandrudu Technical Officer (T-7) (Farm Engineering) under C A S, Cochin, 29 August

Shri S. Srinivasarengan, Technical Assistant (T-4) inducted in to A. R. S. as Scientist S, 15 December.

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to discuss interinstitutional collaboration in research work convened by the University of Agricultural Sciences at Bangalore.

Dr A. Laxminarayana, Scientist S-1, Shri S Dharmaraj, Technical Assistant and Shri B. S. Ajitha Kumar Senior Research Fellow attended the First Indo-Pacific Symposium on Invertebrate Reproduction at Marathwada University at Aurangabad, 27-29 December

Shri P. Karunakaran Nair, Senior Training Assistant at KVK attended the meeting at Land Mortgage Bank, Ernakulam where the representatives from various agricultural financing agencies including fisheries discussed problems faced by fishermen in availing loan facilities.

## With effect from 1 July, 81

Shri Varughese Jacob Computer (T-II-3) as senior Computer (T-4) at Cochin.

Shri G. Krishnankutty Nair, Computer (T-II-3) as Senior Computer (T-4) at Cochin.

Shri P. Sivaraman Computer (T-II-3) as Senior Computer (T-4) at Cochin.

Shri V. Rajendran Computer (T-II-3) as Senior Computer (T-4) at Cochin.

Smt. V. P. Annam, Computer (T-II-3) as Senior Computer (T-4) at Cochin.

Shri K. Ramachandran, Nair Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Vizhinjam.

Shri A. C. Sekhal, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Madras.

Shri P. S. Sadasiva Sarma, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Vizhinjam.

Shri P. K. Mahadevan Pillai, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Cochin.

Shri K. Ramakrishnan, Nair, Technical Assistant (T-II-3) as Technical Assistant (T-4) at Cape Comorin.

Shri R. Bhaskaran Achari, Technical Assistant, (T-II-3) as Senior Technical Assistant (T-4) at Vizhinjam

Shri N. Ratnasami, Technical Assistant, (T-II-3) as Senior Technical Assistant (T-4) at Cochin.

Shri K. C. Yohannan, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Cochin.

Shri K. Nandakumaran, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Calicut.

Shri M. Ayyappan Pillai, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Cochin.

Shri M. Badreuddin, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Mandapam Camp.

Shri T. K. Sudhakaran Deckhand (Senior) (T-2) at Cochin, 24 August

Shri S. Mohideen Meerasa, Deckhand (T-1) as Deckhand (Senior) (T-2) at Cochin, 17 August.

Shri V. Maria Alwaris, Deckhand (Senior) (T-2) at Cochin, 29 August.

Shri K. P. Vijayan as Deckhand (Senior) (T-2) at Cochin, 26 August.

Shri F. Soosai V. Rayan, as Skin Diver (T-I-3) at Tuticorin.

Shri S. Haja Najmudin, Computer (T-2) as Computer (T-I-3) at Cochin.

Shri C. Kasinathan, Junior Technical Assistant (T-2) as Technical Assistant (T-I-3) at Mandapam Camp.

Shri J. Antony Pitchai, Skin diver (T-2) as Skin Diver (T-I-3) at Tuticorin.

Shri P. D. Chidambaram as Oilman-cum-Deckhand (T-2) at Cochin, 1 September.

Shri N. K. Mohanan, S. S. Grade III (Fieldman), as Junior Clerk at Calicut, 24 November,



Shri K. Balachandran, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Cochin.

Shri A. Bastian Fernando, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Tuticorin.

Shri C. V. Seshagiri Rao, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Kakinada.

Shri S. Kalimuthu, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Mandapam Camp.

Shri K. N. Gopalakrishnan, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Cochin.

Shri S. B. Chandrangathan, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Quilon.

Shri M. V. Somaraju, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Waltair.

Shri S. Kandasamy, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) at Madras.

Shri K. Rasachandra Kartha, Technical Assistant (T-II-3) as Senior Technical Assistant (T-4) without prejudice to his appointment as Training Assistant (T-4) at KVK, Narakkal.

Smt. Abha Kant, Technical Assistant (Stat.) (T-II-3) IASRI, New Delhi as Technical Assistant (T-II-3) at Cochin, on interinstitutional transfer, 29 September.

Shri L. Joebai Fernando as Oilman-cum-Deckhand (T-2) at Cochin, 4 September.

Shri S. Mohan as Field Assistant (T-1) at Madras, 28 August.

Smt. Lalitha Sekharan as Field Assistant (T-1) at Calicut, 5 September.

Shri Makodia Bhupatray Vallabh as Field Assistant (T-1) at Veraval, 27 August.

Shri Harilal Arjam as Field Assistant (T-1) at Veraval, 27 August.

Shri V. V. Suryavanshi as Field Assistant (T-1) at Bombay, 19 September.

Shri Govind Nathu Chudasma as Motor Driver (T-1) at Veraval, 1 October.

Shri K. C. Devassy, S. S. Grade III (Fieldman) as Deckhand (T-1) at Cochin, 18 September.

Shri M. Rengan, S. S. Grade III (Lab Attendant) as cook (Boat T-1) at Mandapam camp.

Shri V. Varadaiah, Motor Driver (T-1) as Motor Driver (T-2) at Karwar, 1 July.

Shri K. K. Prabhakaran, Cook (Boat) (T-1) as Cook (Boat) (T-2) at Cochin, 1 July.

Shri K. Alagirisamy as Motor Driver (T-1) at Tuticorin, 29 July.

Shri B. B. Chavan as Field Assistant (T-1) at Bombay, 13 August.

Shri G. Yerinindra Rao as Field Assistant (T-1) at Waltair, 14 August.

Shri P. Bhaskaran as Deckhand Senior (T-2), 22 August.

Shri A. K. Unnikrishnan as Cook (Boat) (T-1) at Cochin 22 August.

Shri P. M. Hariharan, S. S. Grade I (Oilman) as Deckhand (7-1) at Cochin, 6 November.

Shri R. G. Kavikar as field Assistant (7-1) at Bombay, 6 November.

Shri G. Vijayan as S. S. Grade I (Watchman) at Cochin, 13 July.

Shri V. Gopi as S. S. Grade I (Safaiwala) at Calicut, 19 August.

Shri V. R. Arunachalam as S. S. Grade I (Messenger) at Cochin, 3 August.

Shri V. Kochunaryanan Nair as S. S. Grade I (Watchman) at Calicut, 8 August.

Shri S. Antony as S. S. Grade I (Messenger) at Calicut, 9 September.

Miss V. Savithri as S. S. Grade I (Safaiwala) at Cochin, 6 November.

Shri T. V. Shaji as, S. S. Grade I (Messenger) at Cochin, 7 November.

Shri M. B. Xavier as S. S. Grade I (Messenger) at Cochin, 9 November.

Shri N. P. Mohanan, as S. S. Grade less I (Safaiwala) at Cochin, 9 November.

Shri V. C. Gopi as S. S. Grade I (Safaiwala) at Cochin, 9 November.

Shri T. Vijayakumar, as S. S. Grade I (Messenger) at Cochin, 10 November.

Shri K. N. Balan as S. S. Grade I (Safaiwala) at Cochin, 12 November.

Shri P. K. Achuthan as S. S. Grade I (Watchman) at Cochin, 12 November.

(Continued on page 18)

## Relief

Shri. M. G. Dayanandan, Technical Officer (T-7) on superannuation, 30 April

Dr V. Balakrishnan, Scientist S-3 and officer-in charge, K V K on superannuation, 30 June.

Shri S. Rajagopalan, Senior Administrative Officer on superannuation, 31 August.

Shri T. Tholasilingam, Scientist, S-3 on superannuation, 31 August

Shri S. D. Dhuri, Field Assistant (T-1) on resignation, 31 July.

Shri N. Narayana, Field Assistant (T-1) on resignation, 10 August.

Shri Mascarenhas Robert, Field Assistant (T-1) on resignation, 10 August.

Shri P. Kuttappan Pillai, SS Grade III, L. A. on superannuation, 31 May.

Shri K. Kathiresan, S. S. Grade III (L. A) on invalid pension, 30 June.

Shri A. Kathavarayan, S. S. Grade III (L. A) on Voluntary retirement, 30 June.

Shri K. Raman, S. S. Grade IV (L. A) on invalid pension, 30 June.

Smt. P. J. Theresia, S. S. Grade I (Safaiwala) on retirement, 31 July.

Shri P. K. Londhe, S. S. Grade I (Messenger) on resignation, 22 July

Shri P. Viswanathan, S. S. grade IV (Fieldman) on retirement, 30 September.

Shri R. V. Ajay Kumar, Junior Stenographer on resignation, 8 October.

Shri. E. J. Dassan, S. S. Grade IV (L.) on voluntary retirement, 30 November.

Shri A. Pitchai, S. S. Grade III on superannuation, 31 December.

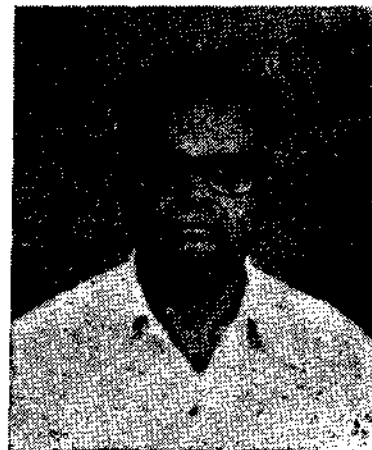
Shri Dalvi Babu Rajaram, Junior Clerk on resignation, 18 November.



*Dr V. Balakrishnan*



*Shri Rajagopalan*



*Shri T. Tholasilingam*



*Shri E. J. Dassan*



*Shri P. Kuttappan Pillai*

(Continued from page 16)

Shri A. Palanichamy as S. S. Grade I (Messenger) at Mandapam Camp, 4 November.

Shri K. Jayabalan as S. S. Grade I (Messenger) at Mandapam Camp, 30 November

Shri M. P. Mohandas as S. S. Grade I (Messenger) at P F L Cochin, 2 December.

Shri R. Dalayya as S. S. Grade I (Safaiwala) at Waltair, 2 December

Shri T. M. Abdul Azeez as S. S. Grade I (Messenger) at Cochin, 8 December.

Shri M. Ragavan as S. S. Grade I (Messenger) at Bombay, 24 December.

### Transfers

Kumari Gracy Mathew, Scientist S-1 from Tuticorin to Calicut.

Shri K. V. Somasekharan Nair, Scientist S-1 from Calicut to Cochin.

Shri P. Ramadoss, Technical Assistant (T-II-3) from Calicut to Madras.

Shri N. P. Kunhikrishnan, Technical Asst (T-2) from Karwar to Cochin.

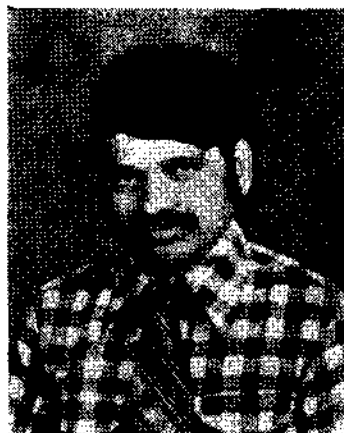
Shri K. Balachandran, Junior Technical Assistant (T-2) from Karwar to Cochin.

Shri M. Lakshmanan, S. S. Grade III (Fieldman) from Madras to Mandapam Camp.

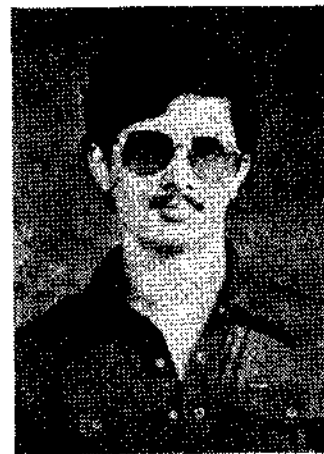
Shri R. Vellayan S. S. Grade III (L A) from Madras to Mandapam Camp.

Smt. V. Parukutty, Junior Clerk from Calicut to Cochin.

### Award of Degree



Shri. A. Laxminarayana, Scientist S-1 at NPCL has been awarded Ph. D degree for his studies on Energy Utilization in some crustaceans by Madurai Kamaraj University, November, 1981.



Shri K. Sunilkumar Mohamed, son of Shri K. H. Mohamed, scientist S-3 of CMFRI secured First Class and First Rank in M. Sc. Marine Biology & Oceanography from centre of Advanced Studies in Marine Biology of Annamalai University, Porto Novo.

Shri N. Chennappa Gowda, Field Assistant (T-1) from Bhatkal to Karwar.

Shri Maruti Shankar Nair, Field Assistant (T-1) from Karwar to Bhatkal

Shri Jainulabdeen, Serang (T-2) from Mangalore to Mandapam Camp.

married Kumari K. Suseela at Kundrakudi, 2 September.

Kumari E. Sasikala, Hindi Typist at Cochin married Shri M. Madhusudhanan at Cochin, 11 September

Shri V. B. Sadasiva, Lascar at Mangalore Research Centre married Kumari Yamuna, 16 October.

### Weddings

Shri C. Manimanran, T-1 at Tuticorin married Selvi N. Sundary at Sengamangalam, 8 July.

Shri Michael, Chief Engineer (T-6) R. V. Skipjack married Kumari Celine at Palai, 23 August.

Shri S. Kalimuthu, Technical Assistant at Mandapam

### Obituary

Shri M. K. Purushothaman, SS Grade I (Peon) at PFL, Cochin expired on 1 October.

A sum of Rs 1426 contributed by the staff of CMFRI, Cochin was handed over to Smt T. K. Leela, Wife of Late Shri M. K. Purushothaman.