No. 126 July-September 2010 ISSN 0972-2386

cadalmin
CMFRI Newsletter

http://www.cmfri.org.in

INSIDE

National Workshop on Sea Cage farming at Karwar

Page 6

Unique feature of CMFRI National Marine Fishery Data

see back cover

भाकृ अनुप ICAR

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
P.B. No. 1603, Ernakulam North P.O., Cochin - 682 018

कडलमीन TM cadalmin

Published by

Dr. G. Syda Rao
Director
Central Marine Fisheries Research Institute
Post Box No. 1603, Ernakulam North P.O.
Cochin - 682 018, Kerala, India
Telephone: 0484-2394867
Fax: 91-484-2394909
E-mail: mdcmfri@md2.vsnl.net.in
Website: www.cmfri.org.in

Editorial Board

Dr. R. Sathiadhas, Chairman
Dr. R. Narayanakumar
Dr. C. Ramachandran
J. Narayanaswamy

Editor

V. Edwin Joseph

Secretarial Assistance

P. R. Abhilash

About CMFRI

The Central Marine Fisheries Research Institute, Cochin, is a premier research Institute under the Indian Council of Agricultural Research, devoted to research and training in marine fisheries and mariculture.

CMFRI has three Regional Centres viz., Mandapam Camp, Visakhapatnam and Veraval and seven Research Centres distributed along the Indian coast line, catering to the marine fishery policy needs of all maritime states of the country.

Director speaks

I am glad to inform that we have once again achieved a record harvest of seabass at Karwar (16.7.2010) and at Chemmenchery near Chennai (3.8.2010), which indicates that we are gradually establishing our supremacy in open sea cage farming. The success is the result of our concerted & wholehearted involvement and commitment towards achieving sustainable open sea cage farming.

In our journey towards establishing Open Access Institutional Digital Repository in our library, we have uploaded about 6000 scientific papers of our staff members published since 1953 in CMFRI website as eprints@cmfri which places CMFRI as the first ICAR Institute to reach this stage. CMFRI also ranks first at national level and fifth at global level among the open access repositories on marine sciences.

We have also initiated the exercise of preparing the EFC document for the 12th Five Year plan. We need to put all our energy into the preparation of this document, which will be the blueprint of our programmes for the next five year plan. Our march towards success should build our confidence to face the challenges in achieving our objective of sustainable fisheries management.

With best wishes,

Dr. G. Syda Rao
Director

Front Cover: Dr. P. Krishnaiah, Chief Executive, NFDB inaugurating the National Workshop on Sea Cage Farming at Karwar

Bumper Harvest of Asian Seabass *Lates calcarifer* cultured in open sea cage at Chennai

Thiru K. P. P. Samy, Hon'ble Minister for Fisheries, Tamil Nadu and Dr. G. Syda Rao, Director, CMFRI holding up the harvested fish

A demonstration trial on open sea cage culture of the Asian seabass conducted by Madras Research Centre of CMFRI in Chemmencherry village (Kovalam Panchayat), South of Chennai was successfully completed on 3rd August 2010, with a bumper harvest of 3.5 t of seabass at the end of six months of rearing in the open sea cage.

Ten thousand numbers of seabass seed of 2 g average size, (4.2 cm TL) were stocked in August 2009. The seed were transported to the Kovalam Field Laboratory of Madras RC of CMFRI. Nursery rearing was carried out at the Kovalam Field Laboratory in cement tanks with running water system and FRP tanks with closed recirculatory system using undiluted seawater. The survival rate was about 70% and the seed available for stocking was 7000 numbers. The size at the time of stocking in the cage was 17-22 cm (60-100 g).

The seabass juveniles were shifted to the cage in a mildly anaesthetized condition in 200 L High Density Poly Ethylene (HDPE) barrels with a window cut along the side (20cm x 20cm) and polished edges. 100 L of filtered seawater pretreated with one ppm AQUIS/clove oil was filled in the barrels and the seabass juveniles were transported at densities of 125-150 nos. per trip. Transportation of the fish was carried out with aeration provided by diffusing free oxygen gas through sandstones from compressed oxygen cylinder. The total time for transportation and transfer to cage was one hour and was completed with 100% survival.

The cage was moored in the sea off-Chemmencherry at 12°46.815'N; 080 15.521E in February 2010, about a km from the shoreline. The site being shallow (8 m depth) and with rocky substrates, the cage was modified to have a reduced column height. The circular outer cage net was of 7 m diameter and 4 m depth and the inner cage net was of 6 m diameter and 3 m depth. The nets were suspended as two separate pieces, overlapping at the floating pipe level. HDPE ballast pipe (2 1/2" dia) with 5 mm holes at regular intervals, having three 16 mm steel wires inserted into it is used as sink weight for stabilizing the column structure of the outer cage. Polished marble stones (1-1.5 ft x 0.5 ft) each weighing approximately 15-20 kg, 1 gabion (3x1x1 m) and PP ropes (12 mm and 32 mm) were used for mooring. Indigenous sealed, PUF filled Sintex milk cans were used as buoys. Regular net cleaning and net exchange during the culture period were imperative in order to avert the impact of fouling by other organisms. The cage withstood rough sea conditions, including *Cyclone Laila* in May 2010.

The rearing period was six months. Feed was given twice a day. A combination of different feeds including commercial pellet feeds, fresh shrimp meat and fresh fish meat were given at different stages of the culture phase. The ration size increased as the biomass of the fish inside the cage increased. Periodical sampling was also done to monitor growth and survival of the fish. At the time of harvest, the fishes had attained sizes ranging from 0.8 kg to

1.8 kg weight (25-49 cm total length) with an average weight of 1.3 kg. More than 90% of the fishes were in the weight range of 1.1 to 1.5 kg.

The harvest was conducted at a grand Harvest Mela organized at Chemmencherry on 3rd August 2010. Dr. G. Syda Rao, Director, CMFRI, presided over the function. The harvest was conducted in the presence of the Chief Guest Thiru K. P. P. Samy, Hon'ble Minister for Fisheries, Tamil Nadu State. Dr. A.G. Ponniah, Director, Central Institute of Brackishwater Aquaculture (CIBA), Dr. M. Sakthivel, President, Aquaculture Foundation of India (AFI), Thiru Thillai Govindan, Jt. Director, Tamil Nadu State Fisheries Dept., Thiru S. Janakiraman, President, Kovalam Panchayat, Thiru Fernando, Proprietor, Victoria Sea Foods and other dignitaries and representatives from different R&D organizations and State and Central Departments were also present. The Harvest Mela was inaugurated by Hon'ble Minister, Thiru K. P. P. Samy by lighting the lamp. Dr. G. Mohanraj, Scientist-in-charge, Madras Research Centre of CMFRI welcomed the gathering. Dr. G. Syda Rao delivered the presidential address. Dr. A.G. Ponniah, Thiru Thillai Govindan, Thiru. S. Janakiraman and Thiru Fernando offered felicitations. Thiru K. P. P. Samy in his inaugural address commended the achievement of CMFRI and the active role played by the Madras Research Centre towards promoting open sea cage culture along the Tamil Nadu coast. Dr. Joe K. Kizhakudan, Senior Scientist, Madras Research Centre of CMFRI & Officer-in-charge, Kovalam Field Laboratory proposed Vote of Thanks.

The harvested fish were sold at prices ranging from Rs.180/- to Rs. 200/- per kg. The sale proceeds from the harvest, amounting to Rs.5,02,000/- were handed over to the fishermen of Chemmencherry by Dr. P. Krishnaiah, Chief Executive, NFDB at a function held at Madras RC of CMFRI, Chennai. On behalf of the fishermen of Chemmencherry, Thiru S. Janakiraman, President, Kovalam Panchayat received the demand draft. Dr. P. Krishnaiah briefed the fishermen on the developmental plans of NFDB for promoting open sea cage culture by the fishermen. He invited suggestions from the fishermen which would help them to take up the activity in due course with financial aid from NFDB and technical support from CMFRI. The function was followed by an interactive session between the fishermen and the Scientists of CMFRI wherein the pros and cons of taking up open sea cage culture, seed availability, rearing techniques, economic feasibility etc. were discussed.

(Madras RC of CMFRI)

Thiru K. P. P. Samy, Hon'ble Minister for Fisheries, Tamil Nadu addressing the gathering at the Harvest Mela organized at Chemmencherry on 03.08.2010

Dignitaries inspecting the harvested fish

Dr. P. Krishnaiah, Chief Executive, NFDB and Dr. G. Mohanraj, SIC, MRC of CMFRI, Chennai, handing over the Demand Draft of Rs.5,02,000/- to Thriu S. Janakiraman, President, Kovalam Panchayat

Harvesting of fish from the cage

◀ Fisherfolk of Chemmencherry with the harvested fish

Shri. Anand V. Asnotikar, Hon'ble Minister for Fisheries, Govt. of Karnataka inaugurating the harvest festival

Seabass Harvest Festival at Karwar

CMFRI and NFDB held a seabass harvest festival at Baithkol fishing harbour, Karwar on 17th July, 2010. Minister for Fisheries, Govt. of Karnataka Mr. Anand V. Asnotikar inaugurated the function in the presence of National Fisheries Development Board Chief Executive Dr. P. Krishnaiah, CMFRI Director, Dr. G. Syda Rao, Dr. K. K. Philipose, Scientist-In-Charge, Karwar RC of CMFRI. Directors and Joint Directors of various maritime states of India, Industrialists and fishermen. All the dignitaries and the media person visited the cage site of Karwar Research Centre of CMFRI by two purse seine boats to harvest the seabass grown in open sea floating cages. They also visited the low cost cage designed by the Karwar Research Centre.

During the inaugural speech, Hon'ble Minister for Fisheries suggested CMFRI to explore the possibilities of developing cage culture in inland waters also. He appreciated the contributions of CMFRI in promoting fisheries in the Karnataka state and also in India. He mentioned that cage culture had come as a boon to the fishermen as an alternative livelihood.

The National Fisheries Development Board Chief Executive Dr. P. Krishnaiah said in his speech that the board had entered into a memorandum of understanding with CMFRI to develop technology for cage culture. He also called upon the scientists to develop sustainable and dependable model for open sea cage culture of fish. For such initiatives the NFDB will provide 100 percent financial support. He congratulated CMFRI for the successful demonstrations of sea cage farming of fishes and the development of cost effective cage structures for open sea cage farming. He has offered 100 more cages to Karwar Research Centre of CMFRI to popularize the open sea cage culture in Karnataka and Goa. He also said he is hoping that Karwar will become the hub for open sea cage farming in India.

Karwar Research Centre's commendable achievement in Open Sea Cage Farming

CMFRI Director Dr. G. Syda Rao said that Karwar was one of the 14 places in the country selected for open sea cage farming. He hoped that at least one lakh tonne of fish would be harvested by culturing fish in open sea cages. He pointed out that this technology had already been developed in China and South East Asian countries long ago. CMFRI had successfully carried out this experiment for the first time in Vishakhapattanam during 2007. But among all experiments Karwar centre achieved commendable achievement in open sea cage farming in India. He also said that the CMFRI is keen to popularize commercial production of seabass in open sea floating cages and the fishermen will be encouraged to take up commercial production in an intensive way.

Dignitories with the harvested fish

Dr. K.K. Philipose, Scientist-In-Charge of Karwar Research Centre of CMFRI explained about the open sea cage culture carried out at Karwar. He gave an insight about the cost-effective metal cage developed at the centre in detail. He also described about the sea bass culture carried out by the centre at Baithkol and about the marine farm developed at the sea of Karwar. Dr. Philipose explained in detail how these cage culture operations can become an alternative livelihood to poor coastal fishermen. He mentioned the potential of Karwar bays for remunerative and successful open sea cage farming practices. He extended all supports to the fishermen and the industry who are interested in open sea cage culture.

Dr. S.R. Krupesha Sharma, Scientist of Karwar Centre of CMFRI explained about the possibility of disease occurrences in the open sea cage systems and the preventive measures against them. He also mentioned the treatments given to the diseased fishes in cage culture environment by citing the experiences he faced during the cage culture of seabass in various seasons at Karwar.

The fishermen group engaged in cage culture activities at Karwar centre of CMFRI was felicitated. Mementos were distributed to the fishermen by the Chief Executive of NFDB at this function.

NFDB and CMFRI hold National Workshop on Sea Cage Farming at Karwar

Dr. K. K. Philipose welcoming the participants

The National workshop on Open Sea Cage Farming was held on 17th July 2010. It was organised by NFDB and CMFRI. Dr. K. K. Philipose, Scientist in charge, Karwar RC of CMFRI welcomed Dr. P. Krishnaiah, IAS, Chief Executive, NFDB, Dr. Syda Rao, Director, CMFRI, Shri. H.S.V. Gowda, Director, Karnataka Fisheries Department, dignitaries and delegates arrived from far and near places to attend the workshop. In his address Dr. K. K. Philipose stressed on the immense potential of Karnataka state in mariculture operations.

In his brief presidential address, Dr. G. Syda Rao, Director CMFRI suggested the participants to utilize the opportunity through discussions about cage farming.

The workshop was inaugurated by the Chief Guest Dr. P. Krishnaiah, IAS, CEO, NFDB, Hyderabad, which was followed by the release of the Video film on lobster cage culture produced by CMFRI.

The Chief Guest expressed his happiness in attending the workshop at Karwar on open sea cage farming. He emphasized the importance of cage culture to Indian fisheries. He made a mention on the Norwegian salmon production involving computerized facilities for monitoring the entire cage farming operation, including daily feeding etc. However, he had been emphasizing on the necessity for compensating the dwindling catches, through cage culture as a consolation for fishermen.

The aim should be towards providing employment to fishermen and to supply protein through fish culture. The Karwar coast having good topography has good potential for cage culture. He has emphasized that money is only one factor in cage culture. With the successful model developed for lobster in Kanyakumari and seabass at Karwar, he hoped that with scientific input by CMFRI and support from fishermen cage culture can be made successful in India, especially at Karwar. CMFRI has launched cages at 14 locations and has come across socio-economic issues, climatic challenges and many other deficiencies. However, all deficiencies have to be taken care and where private sector cannot venture; it is the government departments to initiate new unestablished technologies.

He explained the important aspects to be taken care of in cage culture. CEO, NFDB hoped that at the end of the workshop appropriate policies can be taken up in commercializing cage culture at Karwar. He congratulated Dr. K. K. Philipose in his achievement at Karwar under the able leadership of Dr. Syda Rao, Director CMFRI and he said that together we can take up cage culture which got delayed by 40 years. He appreciated first ever attempt on cage culture of mullet and pearl spot at Cochin and the good production and feed conversion with low inputs towards culture of these species. He has also highlighted the constraints of cage culture like seed availability, policy regulations, social engineering aspects, etc. He emphasized the fact that, to enter into the sea you need support from fishermen and all other things are secondary. He has also highlighted the value added products developed by CMFRI like silo feed by incorporating tuna waste, 'Varna' ornamental fish feed, as well as the Green Mussel Extract, cobia seed production, artificial reef, etc.

Delegates from various states and organizations attending the workshop

Dr. A. P. Dineshbabu, SIC, Mangalore RC of CMFRI made a presentation on 'Regulatory frame work for mariculture management'. He highlighted on the principles to be considered to frame a leasing policy for mariculture practices in open sea in India. China which started cage culture in 1970s, now contributes more than 5 lakh tones of fish production from cages.

Dr. P. Krishnaiah, Chief Executive, NFDB, Hyderabad releasing the Video film on lobster cage culture

Dr. G.Syda Rao, Director, CMFRI presented an overview of cage culture activities of CMFRI and other marine production technologies. Mr. George, Assistant Manager, Matsyafed, Kerala, spoke about the general profile of Matsyafed, Kerala and the materials supplied to CMFRI by Matsyafed for cage culture operations at different localities in a cost effective manner.

Shri Mahesh Kumar, Assistant Director of Fisheries opined that the major concern in cage culture is 'the use of fish for production of fish'. He suggested the use of chicken waste as feed for seabass.

Dr. Chandra Bhat from Karnataka informed that before commercialization of cage culture, it is essential to know how to protect the industry as well as environment when cage culture becomes a major commercial activity.

Mrs. Sharmila, Deputy Director of Fisheries, Goa expressed her concern over sustainability of cage culture technology before its commercialization, which included

- Standardisation of best cost effective feeds and feeding regimes
- Availability of pellet feeds at affordable prices
- Control in the use of antibiotics during commercialization.

Shri. Sahadevan, Joint Director of Fisheries, Kerala, pointed out that water body leasing is prevalent @ Rs. 10-100 per acre in Kerala. However, takers are few, except for some mussel farmers. He raised his concern on going for high value seabass culture at the cost of nutritional fish as feed has to be analysed.

Dr. G. Syda Rao, Director, CMFRI, clarified the doubts raised by Shri. Sahadevan and pointed out that the entire fishmeal currently produced is being used in poultry and cattle feed industry which has no rationale in it. He told that fish has to be used for fish production also instead of its use as fishmeal. It is ideal to use fish as a feed in cage culture. Use of edible grains for human consumption as substitute for low value fish is not practical, because in India, no feed grade grain production exists. Also, the cost of available grain is higher than that of low cost fish. Since sardine is available in plenty in Karwar and there are no local market preferences, storage or processing facilities for such bulk quantities, it can be fed to seabass in cages.

Shri. G.V. Maddikkeri, Joint Director of Fisheries, Karnataka, queried whether NFDB can draft a policy for leasing seawater for mariculture activities. He suggested that based on seed availability culture systems have to be encouraged. He has also suggested on the possibility of establishment of hatcheries by NFDB, for cage culture to start in a big way. He pointed out that the livelihood of fishermen has to be taken care of and incentives to be provided for fishermen who are all actively involved in cage culture.

Dr. Kirupakaran, NIOT, Chennai, suggested that we have to transform the fishermen from sole capture based livelihood dependence to capture and culture based dependence in due course by encouraging cage culture activities. For that target we must identify ideal species for cage culture.

Shri. Srinivas Raju, progressive fish farmer from Andra Pradesh, pointed out that still people depend only on *P. monodon* culture and no one shows interest for finfish aquaculture in Andhra Pradesh. Cobia and seabass are waiting to be taken off as a new aquaculture ventures in Andhra Pradesh. He also pointed out his concern over availability of seed, feed, etc. for cage culture to start in a big way.

Shri. Rao, Departmentof Fisheries, Andhra Pradesh pointed out that suitable site for cage culture has to be identified by CMFRI all over Indian coast line.

Dr. K. Krishnaiah,IAS, CEO, NFDB, Hyderabad, pointed out that everything is not rosy in cage culture and there do exist problems also. He opined that due to the risks, gaps, doubts and many more issues, no private sector can do cage culture without Government support in India. Investments involved in launching 100-200 cages are huge and nobody will invest blindly like that. Also, none of the Indian private sector is eager in doing R&D in cage culture activities. But as in the case of cement and steel industries which were not owned by many private entrepreneurs till recent past has been revolutionized with the arrival of more and more entrepreneurs at present. Cage culture also needs some time to get popularize. It is the private sector that is responsible for industrialization and they have to take a role in cage culture promotion in India.

Regarding the regulatory frame work, he suggested that if more cages are to be installed regulatory mechanisms are essential. He suggested that if the policy document framed by Tamil Nadu is applicable to Marine Fisheries Regulatory Act, it can be adopted very well. But it is essential to finalize by the State depending on their policy in leasing. He suggested

brainstorming meetings with fishermen and industry stakeholders to frame a model base policy. Environmental issues are to be considered in consultation with Coastal Aquaculture Authority, State Forest Department, Department of Environment, Pollution Control Board and Coast Guard while framing model marine lease policy. To protect investment, insurance is the only solution and it will take time for companies to get convinced and come forward. Zonalization of cage culture, based on climatic and geographic condition, has also to be defined. Quality study on cage reared and wild caught fish, though a future concern can be initiated by Research institutes like CMFRI, CIFT, etc.

Brooder quality has to be taken care for good genetic characters. Proper molecular genetic studies must be conducted for the brooders to ensure superior quality seed production. Otherwise as in the case of scampi, inbreeding would result in poor performance of the seed. NFDB is funding for broodstock development ventures like 'broodstock banks', from where private people can take brooders for commercial seed production. CMFRI has been identified to shoulder the responsibility of management of cage culture in the Indian subcontinent. PPP (public/private /participatory) mode of cage culture operation is recommended. A good model, as like the one developed in Karwar centre of CMFRI has to be developed for taking up cage culture and NFDB will take up second generation model for cage culture in the current year.

In his concluding remarks for the day's session, Dr. G.Syda Rao, Director CMFRI highlighted that, CMFRI is doing broodstock management at different centres, like cobia and Pompano at Mandapam, groupers at Visakhapatnam and red snappers at Karwar, Calicut and Cochin. Finfish broodstock maintenance to be entrusted only with Research Institutes, as it will be a costly and scientific affair. Cage site selection, seed bank/culture calendar, etc., have to be taken care in future by CMFRI. Biosecurity/disease issue/genetic variability studies, etc, have to be given more thrust in future cage culture researches of CMFRI.

The session on 18-07-2010 started at 10:00 hrs by an informal welcome by Dr. G. Syda Rao, Director CMFRI. He has given opportunity for Mr. Raju an entrepreneur from Andhra Pradesh to highlight his experience in seed availability of seabass along A.P. coast. Mr. Raju gave a vivid picture on coastal aquaculture scenario in A.P. and his experiences in entire aquaculture operations including diversification of species for coastal aquaculture.

Workshop Recommendations

- Comprehensive survey and assessment has to be undertaken in different maritime states of the country with the sponsorship from agencies like NFDB for the identification of suitable sites for sea cage farming. Simultaneously environment impact assessment studies have to be undertaken to assess the environment status before and initiation of cage farming in these sites.
- Each State has to come out with a policy for utilization of their coastal waters for mariculture and demarcation of the zones with the same with special reference to the social engineering aspects prevailing in the area.
- Appropriate leasing policies for inshore waters of each State for cage farming have to be formulated for each maritime State. NFDB can bring out suitable national guidelines to frame the policies by the maritime states.
- CMFRI has pioneered in creating resources necessary for sea cage farming and taken the front stage in this direction, by their successful demonstrations at different parts of the country. The positive lessons learnt have to be assessed rigorously for further technological development and expansion of cage farming.
- The technologies pursued further can be aimed at two distinct sectors; artisanal sector for small-scale livelihood and industrial cage farming where capital intensive modern cage farming can be developed. In both these sectors cost-effectiveness and preferability should be given top priority.
- Seed availability is the major concern for the expansion of cage farming. In the case of seabass, where seed production technology is available, private hatcheries have to be sponsored by NFDB.
- Since we don't have standardized technologies for cobia, pompano, grouper and snapper seed production, R&D have to be strengthened for development and standardization of seed production.
- Biosecured and genetically healthy broodstock is the prime requirement for the seed production of marine finfishes. So NFDB can finance a few broodstock centres through R&D institutes like CMFRI.
- Whenever availability of high value finfishes from wild habitats is available the same can be utilized for Capture Based Aquaculture.
- Nursery rearing of hatchery produced seeds to stockable sizes for grow-out cages has to be promoted in private sector by financial assistance by NFDB. This enables the grow-out farmers to get sufficient quantity of nursery reared fingerlings directly from private sector.
- Bank finance and crop insurance have to be taken up with appropriate agencies.
- Cost effective, species specific formulated, nutritionally balanced feeds has to be developed and tested for different candidate species of cage cultured finfishes.
- The carrying capacity of a particular cage culture site, stocking density regarding to species and Environment Impact Assessment studies during cage farming to assess the impact of cage farming has to be taken up by the R&D agencies.

Workshop on by-catch and its Impact on Marine Fisheries

Inaugration of one day workshop at Mangalore

The Mangalore Research Centre of Central Marine Fisheries Research Institute, Mangalore organised a one day workshop on by-catch and its impact on Marine Fisheries on 18th August, 2010 at H.N. Siddiquie Auditorium, Geological Survey of India, Pandeshwar, Mangalore. The Workshop was inaugurated by Shri. V. K. Shetty, Managing Director, Karnataka Fisheries Development Corporation. In his inaugural address Shri. Shetty appreciated CMFRI for bringing out a timely workshop on bycatch and its impacts on marine fisheries of Karnataka. He pointed out that multiday trawlers bring in large quantity of bycatch and its utilization with value addition is very much essential. He emphasized the role of CMFRI in formulating policy on the optimum fishing effort in Karnataka waters to make it sustainable. Dr. E.V. Radhakrishnan, Head, Crustacean Fisheries Division, CMFRI, Kochi, Shri. Sureshkumar, Deputy Director of Fisheries, Shri. Nithin Kumar, President, Trawl Boat Meenugarara Sahakari Sangha Mangalore, Dr. S.M. Shivaprakash, Professor and Head, Marine Fisheries Research and Information Centre, Ankola were the guests of honour for the inaugural function.

Dr. E. V. Radhakrishnan, Principal investigator for the National project on bycatch, presented the key note address "*By-catch in marine fisheries: Indian Scenario*". Considering the fact that major portion of the bycatch comprised juveniles of commercially important fishes, he stressed the importance of allowing juveniles to grow to a breeding size. He encouraged the fishermen to use bycatch reducing devices as well as using square mesh in the cod end for reducing juvenile fish catch. He further added the development of infrastructure for bycatch storage and better utilization of low value bycatch which are generally thrown overboard the vessel. Participatory approach for establishment of marine protected areas and compensation for encouraging the use of bigger meshed cod end was also highlighted. As fishing down the food web in Indian fisheries has started, a precautionary approach in fisheries is very much essential. He appealed to the law enforcement and State Fisheries Authorities to enforce the 35 mm mesh size at the cod end.

The keynote address was followed by two theme presentations "*Recent trends in marine fisheries of Karnataka*" by Dr. Prathibha Rohit, Senior Scientist, Mangalore R C of CMFRI and *By-catch in trawl fisheries of Karnataka: Present status, its impacts and possible solutions by* Dr. A. P. Dineshbabu, Scientist-in-Charge, Mangalore RC of CMFRI.

Dr. Prathibha Rohit detailed the trends in the fishing pattern during the past 20 years in the gear, craft and catch composition. She emphasized the changes in the dominance of different species in the marine fishery landings of Karnataka. She gave an account of the impact of mechanization of fishing craft

Recommendations of the workshop

- The quantity of discards should be assessed and revalidated in collaboration with the fishing industry.
- The potential yield from marine fisheries needs to be revalidated on the basis of the data generated on discards for framing any policies and legislation on Conservation and Management of Marine Fisheries.
- Policy intervention at the manufacturer level to stop the production of legally banned mesh size net production.
- The statutory mesh size for cod-ends should be strictly imposed under the Marine Fishing Regulation Act. Fishermen can be compensated/given subsidy for relinquishing by-catch.
- It is necessary to make technical modifications in the design and operation of trawl gears to make bottom trawling more eco friendly in order to minimize the mortality and devastation of benthic organisms.
- More studies on spatio-temporal distribution on commercial and non-commercial species in their different life stages have to be carried out.
- Effective utilization of presently discarded species has to be charted out.
- "Marine Protected Areas" in selective regions along the Karnataka coast may be established as a measure to rejuvenate the benthic communities for the sustenance of fishery.
- Minimum landing size of fishes needs to be fixed and implemented to stop landings of juveniles and young ones.
- There is an urgent need for regulating the fishing effort in consultative with fishing industry.
- Cold storage facilities for multi-day fishing trawlers should be increased in consonance with their endurance.
- Awareness programmes with the participation of all stakeholders.

A view of the participants at the workshop

on fishery and added that modifications in the trawlers have made a significant impact on the fishery. Fish production that was dominated by purseseines in the nineties was slowly replaced by trawl. Exploitation of demersal fishes like threadfin breams, bullseye flatheads, lizardfish, and pufferfish increased by the modification of trawlers

In the second theme presentation Dr. Dineshbabu, stressed on the International commitment of India for reduction of bycatch under Code of Responsible Fisheries. He explained the discard and trash fish scenario in Mangalore on the basis of research conducted by CMFRI on the trawl fishery of Karnataka. He pointed out that during the last three years the trash landing has increased from 3% to 15 % whereas discarded bycatch percentage showed a reduction. An estimated 64% (by numbers) of discarded bycatch was constituted by juveniles of commercially important fishes questioning the sustainability of these resources. He emphasised the use of spatio-temporal data on commercial and non-commercial juveniles in catch and discard in trawling grounds for resource mapping. He highlighted the importance of GIS based mapping of fishery resources for helping the policy makers to recommend operation based discard reduction practices.

The presentations were followed by discussion with the active participation of marine fisheries experts, Dr. Shanbhogue S.L., Former Director of Instructions (DI), College of Fisheries, Mangalore, Dr. Ramachandara Bhatta, Professor and Head, Dept of Fisheries Economics, College of fisheries, Mangalore, Dr. S. M. Shivaprakash, Professor and Head, Marine Fisheries Research and Information Centre, Ankola, Shri. Sureshkumar, Deputy Director Dept. of Fisheries Karnataka, Shri. Rajkumar Naik, Assistant Director, MPEDA and stake holders especially trawl boat owners and operators Shri. Nithin Kumar, President, Trawl Boat Meenugarara Sahakari Sangha Mangalore, Shri. Shashi Kumar, Capt. Jayaprakash Mendon, Nagesh Bolar, Harish Chandra Mendon, Thukaram Bengare trawl owner's representative and others.

Dr. Meenakumari takes charge as Deputy Director General (Fisheries), ICAR

Dr. B. Meenakumari, Director, Central Institute of Fisheries Technology, Cochin assumed the charge as Deputy Director General (Fisheries) at Indian Council of Agricultural Research, New Delhi. She is the first ever woman scientist to occupy this prestigious position. Dr. Meenakumari, who is having more than 32 years of service in ICAR is a distinguished scientist in the field of Fishing Technology with about 100 research publications to her credit. Earlier she was the Director since November 2008. She has done extensive research in the areas of development of new fishing gear for coastal and deep sea fishing, conservation of fishery resources, up-gradation of gear systems for reservoirs, introduction of ecofriendly fishing methods, remote sensing and validation of PFZ, pollution monitoring, environment impact assessment, marine corrosion and 'biodeterioration', fisheries policies of Kerala state etc.

Dr. Meenakumari is a recipient of Young Scientist Award of Govt. of Kerala (1989), Fellow of Academy of Environmental Biology, Lucknow, Fellowship Award (2002) from Bioved Research Society, Allahabad, Panjabrao Deshmukh Women Agricultural Scientist Award (2002) of ICAR, Vasvik Award (2003)WATI National Award (2007), Fellowship of the Academy of Science, Engineering and Technology (F.ASET), Fellowship award from Zoological Society, Calcutta (2008) and Dr. R.C. Dalela Oration Award (2009), ICRISAT, Hyderabad.

She undertook studies at International Ocean Institute, Canada on UN Convention on the Law of the Sea and its implementation (1977), Bedford Institute of Oceanography, Canada on receiving POGO-IOC-SCOR fellowship (2002) and Plymouth Marine Laboratory, U.K. to attend First Chlorophyll Workshop and Meeting (2006).]

Hazardous oil spill in Mumbai Port and adjacent fishing areas

Containers spilled from accident vessel MSC Chitra

(Photo courtesy NDTV)

A catastrophic collision of two merchant ships occurred in Mumbai Port on 7th August 2010 which resulted in spilling of about 800 t bunker oil and tumbling of 293 cargo containers with hazardous chemicals in the sea. The oil and the spilled chemicals are hazardous to the inshore and nearshore fishing areas around Mumbai while the sunken and floating containers have threatened navigational safety of several mechanized and non-mechanized fishing boats operating in the harbour area.

The bunker oil with long hydrocarbon chains (alkanes, cycloalkanes and aromatics) and the spilled chemicals (Aluminum phosphide, Parathion and sodium hydroxide) are toxic to aquatic ecosystem and have tendency to accumulate in fish. These materials by nature of their composition will have short term and long term impacts on the coastal environment and fishery resources. The Maharashtra Pollution Control Board (MPCB) has analyzed seawater samples from open sea to the inshore creeks and the basin of the port. The oil spill and fish landed from the affected areas were inspected by the scientists of Mumbai Research Centre, which indicated that the oil spill and other chemicals spread over 3 coastal districts affecting 33 fishing villages. Owing to monsoon winds, tides and circulation a portion of the spilled oil entered the creeks and rivers adjoining the harbour and spread along the inshore areas and the mangrove swamps covering an estimated area of 56 km^2. The oil spill has occurred just when the mangrove seedlings are getting formed, which usually start germinating soon after the monsoon. Clean up operations for removal of oil from mangrove were initiated by the MPCB with the help of fishing community and zapping with microbes by Tata Energy Research Institute. As these mangrove swamps serve as nursery grounds for variety of fishes and prawns the long term effects on the fishery could be distressing. The clean up operations of mangroves, beaches and retrieval of containers were taken up by the coast guard and the Mumbai Port Trust under the supervision of DG Shipping.

Despite long lasting effects of oil spill on marine life, the effects on the fishery resources were relatively short and no mass mortality of fish was reported in the affected area. Most of the fin-fishes perhaps avoided the oil spill area and returned after the spill drifted. However, stranding of about 100-150 sting rays (*Himantura Uarnak*) and a dolphin was reported along the beaches at Uran and Mandva respectively. The inner portion of the port where the spill drifted is the productive fishing area for a large number of small scale fishers, operating traditional fishing gears and contrivances in creeks and inshore waters, especially during monsoon months when open sea fishing is suspended due to inclement weather conditions. The area is known for diversity of 73 species of fin fishes, crustaceans and molluscs. The prominent fish varieties in the fishing ground are penaeid and non-penaeid shrimps, Bombay duck, golden anchovy, pomfrets, perches, croakers, ribbonfishes, catfishes and lobsters. Preliminary analysis of fishery data for August 2010 showed decrease in fishing effort by mechanized vessels by 29% and decline in landings by 6% while the non-mechanized fishing recorded 49% decline in landings. The bag net fishing in the harbour suffered heavily as the landings in August 2010 declined by 73.4% despite increase in average catch rate from 151.9 kg/unit (2005-2009) to 172.9 kg/unit. The value of bag net catch in August 2010 recorded 77% decline as compared to the same month of last year.

The oil spill created panic among the fish eating public. Civic authority of Mumbai Municipal Corporation disallowed landing of contaminated fish at the landing centres and wharfs immediately after the spill. Owing to this the fish prices plummeted significantly by 25-50%. Consequently, the fishermen suffered and lost livelihood means from the day of oil spill as the fish catch was contaminated and navigation in the port area was dangerous because of floating and sunken cargo containers. The preventive orders and notifications from various Government Agencies and wide publicity by media to refrain from eating fish lead to poor consumer demand and subsequently fall in fish prices.

Although oil as such may not be highly toxic, the spill with other chemicals and pesticides is likely to produce synergistically far more hazardous long term impacts on the marine ecosystem. Further investigations are being carried out by the scientists of Mumbai Research Centre.

(Prepared by V. D. Deshmukh, V. V. Singh, Anulekshmi C. and Gyanaranjan Dash of Mumbai Research Centre of CMFRI)

Research Highlights

Mass mortality of stingrays at Uran, Maharashtra

Mass mortality of stingrays was observed at Mankeshwar Beach near Kharkhand village, Uran, District Raigad on 22-08-2010. About 100 – 150 fishes were reported to have stranded in rocky embankments of the intertidal zone. These 'bundh' like structures of stones are about 1 to 1.5 m in height, which are used by the local fishermen to fix nets to catch fishes during tidal movement. The species was identified as *Himantura uarnak*, (Forsskål 1775) commonly called as 'Honeycomb sting ray'. This seems to be the first incident of mass mortality of stingrays along Maharashtra coast in recent years.

Sting rays stranded at Uran

Biological studies were carried out on the site. The Disc length (DL) of the rays ranged between 99 – 112 cm. The Disc width (DW) could not be measured as the local fishermen had chopped the discs laterally for consumption, however one individual was found intact and the DW was recorded as 112 cm. The species attains at least 200 cm disc width (DW). These are reef-associated species commonly found off sandy beaches, shallow estuaries and lagoons and may sometimes enter fresh water. They also occur in offshore to depths of at least 50 m. *H. uarnak* is widely distributed in the Indo-West Pacific from the Mediterranean Sea to northern Australia.

Maturity studies revealed that all the dead individuals were ripe females with one or two fully developed pups in their uterus. The species is Viviparous. Sexual maturity is attained at a disc width (DW) of 100 cm which corresponds to age of 4 to 5 years. Size of pups at birth is 21 – 28 cm DW. Fecundity is low with only 1 - 2 embryos. Embryos feed initially on yolk and then eventually receive additional nourishment from the mother by indirect absorption of uterine fluid enriched with mucus, fat or protein through specialised structures. According to the villagers just before dying they had released their pups. Gut content revealed that they fed mainly on crabs and fishes. Normally they feed on small fishes, bivalves, crabs, shrimps, worms and jellyfishes.

This incident took place immediately after the oil spill off Mumbai coast caused due to collision of MSC Chitra and MV Khalijia-3.

These stingrays may have been swimming toward shallow sandy beaches for spawning purposes but due to the spilled oil and chemicals off Mumbai coast, they might be disoriented from their routine migration and drifted to Mankeshwar beach. Petroleum hydrocarbons produce serious consequences by interfering with chemoreception as chemical senses play a major role in mediating critical aspects in the behavior of marine organisms, including feeding, reproduction, habitat selection and predator recognition. During high tide they might have entered intertidal zone but when water started receding at low tide, they were trapped in rock crevices and 'bundhs'. Further studies are being carried out on the causative factors leading to this mass mortality.

(Reported by: Thakur Das, S.D.Kamble, Vaibhav Mhatre, Ramesh Rao and Sujit Sundaram. Mumbai Research Centre of CMFRI.)

Sea cow *Dugong dugon* (Muller) washed ashore dead at Rameswaram

The sea cow Dugong dugon (Muller), a highly endangered marine mammal is listed under the Schedule-I, Part I of the Wildlife (Protection) Act, 1972. On 6th April, 2010 was a sea cow washed ashore dead at Rameswaram fish landing centre. A deep cut measuring 147cm was observed on the ventral side of the animal, which indicated an attempted slaughter of the animal. The sea cow was a well-grown adult female and weighed approximately 500kg.

(Reported by K. Vinod, V. S. Kakati, N. Ramamoorthy and Sethuraman)

The dead sea cow washed ashore at Rameswaram fish landing centre

Revival of bivalve *Catelysia opima* (Gmelin) fishery along Dadar beach, Mumbai

Hand picking bivalves

Sudden abundance of bivalves in large numbers was observed during March-June'09 along Dadar beach in Mumbai in the intertidal zone. About 200-400 men, women and children from the nearby areas began excavating and hand picking the bivalves daily from the sand. There is very good demand for these bivalves and they fetched a good price in the local market.

The bivalve was identified as *Catelysia opima* (Gmelin) (Class: Bivalvia, Order: Veneroida, Family: Veneridae). The shells were moderate in size and ranged in length (L) between 10 mm to 33 mm with the corresponding body weight (W) ranging from 0.211 to 4.693 g. The length-weight relationship was estimated as $W = 0.00058_{*} L^{2.5207}$ and the average density of animals was 24 per square meter. The other bivalve species which were found along with this species were *Gafrarium divaricata* (Chemnitz) and *Meretrix meretrix* (Linne) but were less in number. These bivalves were exploited maximum during full moon and new moon days when the tides are extremely low and large intertidal area is exposed.

Catelysia opima

Local fishermen were of the opinion that such population eruption occurs every five year but an eruption of this magnitude was observed after a period of twenty years. The reason for such eruptions can be attributed to the comparatively cleaner water along Mahim bay due to the closure of a textile mill which used to indiscriminately discharge chlorine rich effluents in to the sea. Secondly, the commissioning of the 'Marine outfall sewage project' along Mumbai coast has also improved the sea water quality and reduced the total suspended solids from the sewage that was deteriorating the beach due to decomposition and purification of organic matter causing hypoxic conditions.

(Mumbai Research Centre)

New record of fish from Andaman waters

Centroberyx rubricaudus

On 28 March 2010, a single specimen of the Red alfonsino, *Centroberyx rubricaudus* of total length 215 mm was collected from a vessel operated in the Bay of Bengal and landed at Bamboo Flat, Andaman Islands. This is the first report of the species from Indian waters. The morphometric and meristic characters of the specimen was studied as per standard format. This fish has been reported earlier only once from the southern coast of Taiwan.

Species in the genus *Centroberyx* have their habitat on the shelf and upper slope to a depth of 700 m. Of the seven species recorded, three species (*C. lineatus, C. affinis, and C. gerrardi*) are distributed in the Indo-Pacific and three from Indian Ocean (*C. spinosus* on the South African shelf, *C. druzhinini* on the Saya de Malha Bank and *C. australis* on southern Australia) and one from *C. rubricaudus* in Northwest Pacific, endemic to Taiwan. This report of *C. rubricaudus* is the first record from the East coast of India and the first from Andaman Islands and indicates a marked extension of the distribution from its type locality.

(Demersal Fisheries Division)

Congregations of squids in inshore waters at Mumbai

Squids are known to form large congregations in inshore waters during spawning season. Spawning congregations of squids at staggered intervals along Kerala-Karnataka coast (September – October) have been reported which generally occur along the southwest coast of India with varying intensities during the post monsoon period. The studies suggest that spawning of squids usually occur when water temperatures increase. According to reports, along the southwest coast of India, the surface and sub-surface seawater temperatures in the inshore areas evince a sudden increase during September -October after the southwest monsoon and this could probably explain the congregation of squids. However some experts opine that species of squids congregate along the shore for feeding.

A similar phenomenon of congregations of squids from inshore waters of Mumbai is reported for the first time. The local fishermen were of the opinion that they have never observed such a phenomenon before in their lifetime and hence occurrence of this incidence from Mumbai waters gains more importance. During this phenomenon the sea around Mumbai was very squally with intermittent rains. The squids were mainly *Loligo duvauceli* (90%) followed by *Loligo (Doryteuthis)* sibogae (10%).

Huge congregation of this species was observed along Versova-Juhu beach and inshore waters from 3-10-09 onwards and the phenomenon lasted for about a week. This phenomenon was observed almost all along the coastline of Mumbai, but at Versova it was of a higher magnitude. In fact at Versova, squids were observed in creeks also and fishermen caught them with scoop nets. At Versova nearshore waters trawl nets, drag nets and even shore seines were used to exploit them. Trawling operation was carried out at nearshore waters at about 2 m depth. The catch rate of the species in trawl was 150 kg/haul at low tide.

Harvested squids

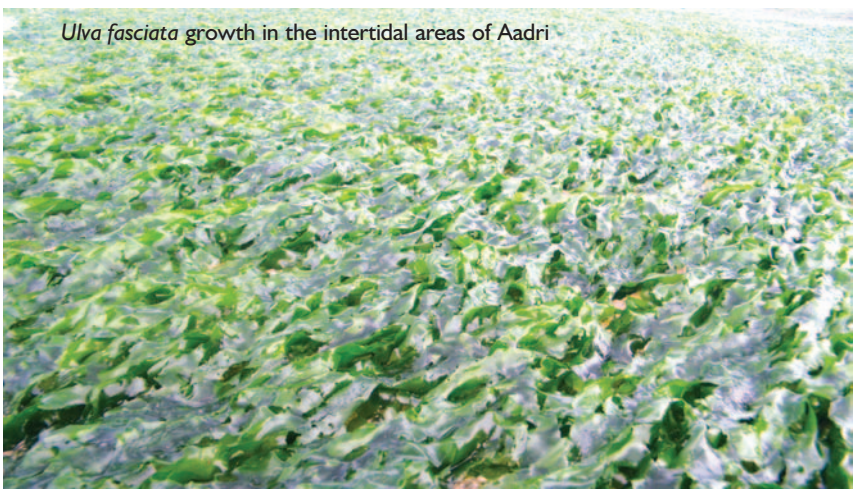
The dorsal mantle length of males ranged from 120 – 180 mm and females ranged between 121 to 195 mm. On further biological analysis of the specimens brought to the laboratory, it was observed 100% of the females and 95% of the males were in mature condition and almost all had empty stomachs (95%). The occurrence of such sizeable quantity of mature squids during the period indicates that the squids might have congregated for spawning. The squids could not move out with the receding tides, probably because of spawning exhaustion and therefore they were hand picked by people on the beach. The catch was later marketed in local market and they fetched comparatively higher value because of its freshness.

Studies are being carried out to ascertain the probable causes of this phenomenon along the Mumbai coast.

(Reported by: Sujit Sundaram and V.D. Deshmukh, Mumbai Research Centre of CMFRI)

Unusual growth of *Ulva fasciata* at Aadri of Saurashtra Coast, Gujarat

Heavy growth of *Ulva fasciata* is seen in the intertidal areas of Aadri of Saurashtra Coast. Aadri is a coastal village 15 kms away from Veraval. The shoreline is rocky and could be considered to have species which are common in structured communities. Sparids and Pomacentrids form the major catch of fishermen operating handlines from shore. Bumper catch of *Megalaspis cordyla* was reported from Magrol landing centre in gillnet fishery on 15th September.



Ulva fasciata growth in the intertidal areas of Aadri

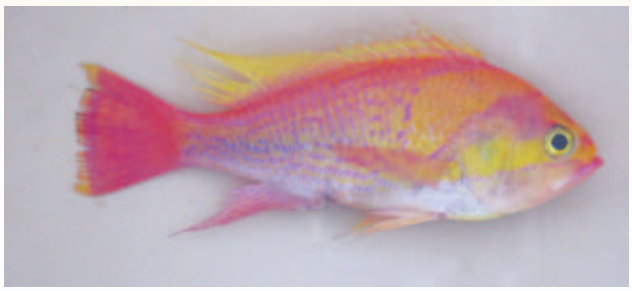
Unusual occurance of *Porpita porpita* in Aadri beach, Gujarat

Large numbers of Blue button, *Porpita porpita,* washed ashore in Aadri Beach near Veraval during monsoon. It is a gelatinous Cnidarian, resembling Jellyfish but belongs to Class Hydrozoa. The blue button lives on the surface of the sea and consists of two main parts: the float and the hydroid colony. It competes with other drifters for food and mainly feeds on small fish, eggs, and zooplankton.

(Veraval Regional Center of CMFRI)

Porpita porpita

Rare fishes landed at Puthiappa landing Centre, Calicut



Pseudanthias sp

Chelidoperca investigatoris (Alcock, 1895)

During a routine visit to Puthiappa fish landing centre on 13-8-2010 while observing the trawl landings a few brightly coloured rare fish specimens were also observed along with the landings of threadfin breams and lizard fishes. The rare specimens were later identified as

1. *Pseudanthias* sp.,
2. *Chelidoperca investigatoris* (Alcock, 1895)
3. *Roa jayakari* (Norman, 1939)

It is noteworthy observation that these rare specimens were caught soon after the end of the trawl ban period. During this period, sea condition was rough with surface to bottom churning and inshore water remained murky. Water temperature was between 24-25°C.

(Reported by K.P. Said Koya, Calicut RC of CMFRI)

Roa jayakari (Norman, 1939)

On a large sized Indian halibut, *Psettodes erumei* (Bloch & Schneider, 1801)

Psettodes erumei

Fishery of Indian halibut, *Psettodes erumei* (Bloch & Schneider, 1801) declined considerably in the recent past. During the recent years their fishery was very sporadic and catches were represented by relatively smaller fishes below 30-40 cm along the southwest coast of India. In August 2010 a large sized *Psettodes erumei* measuring 60 cm TL was observed at Cochin Fisheries Harbour, Kerala. The reported maximum size of the species is 64 cm TL.

(Reported by K.V. Akhilesh, K.K.Binnesh & R. Shanis, SRFs, Pelagic Fisheries Division)

A new anthine fish

Pseudanthias sp.

An anthine fish belonging to genus *Pseudanthias sp.* (Serranidae) collected during early 2008 from Cochin and Quilon, Kerala was confirmed as a new species. The type specimens are deposited in the National Referral museum at CMFRI, Cochin, India and SAIAB museum, South Africa.

First record of pelican flounder, *Chascanopsetta lugubris* from Malabar region

Chascanopsetta lugubris

Pelican flounders are distributed in the Eastern Atlantic: Gulf of Guinea round the Cape to Natal, South Africa. Western Atlantic: Florida, USA and northern Gulf of Mexico to Brazil. Indo-Pacific: off the eastern coast of Africa and off India and Sri Lanka to Japan. Few specimens of *Chascanopsetta lugubris* (Alcock), 1894, belonging to the family Bothidae was observed in the discard sample collected from Puthiappa Fisheries Harbour on 16.8.2010. The specimens measuring 218 - 222 mm in length and weighing 48 - 51 g were caught by a trawler operated off Calicut at a depth of 160m. The distinguishing characters of this species is that the body is elongate, laterally compressed and eyes are on left side. It is having a uniform dark grey colour, maxilla long extending backward well beyond posterior edge of eye. Large mouth with small teeth and gillrakers absent. Dorsal fin rays 115-118, origin of fin well in front of eyes; anal fin rays 71 to 82; pelvic fin bases unequal in length, that on eyed side much longer. Scales small, cycloid on both sides and 189 in lateral line. It is having greyish colour in eye side; fins dusky; peritoneum black, visible through the thin abdominal walls. Blind side uniformly light. It is usually found in the deeper continental shelf to depths of almost 1,000 m. It is very rare in the trawl catches.

(Reported by P. P. Manojkumar, Calicut Research Centre of CMFRI)

Rediscovery of Quagga shark *Halaelurus quagga* after a century

Quagga shark, *Halaelurus quagga*

One of the world's rarest shark *Halaelurus quagga* (Alcock, 1899) Scyliorhinidae was collected from Cochin and Quilon landing centres of Kerala. This is the second specimen from India and available third report in the world.

(Pelagic Fisheries Division)

A red listed (IUCN) Juvenile of Giant grouper caught at Korapuzha

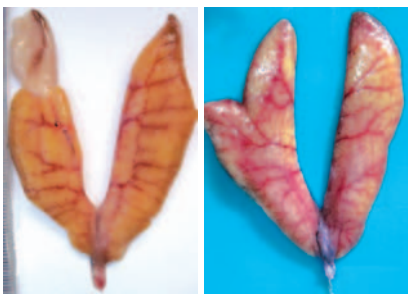
Lateral view of Giant grouper *Epinephelus lanceolatus* maintained in the Marine Reseach Aquarium

A juvenile Giant grouper *Epinephelus lanceolatus* (Bloch, 1790) was caught by the gillnet at Korapuzha estuary, Elathur near Calicut in June 2010. *Epinephelus lanceolatus* is included in the IUCN red list of threatened species under the vulnerable (VU) category. The total length of the specimen caught is 236mm. This is maintained in the marine research aquarium of the Calicut centre .

E. lanceolatus is the largest reef-dwelling fish in the world. Being such a large predator, it is rare even in areas unexploited by fishing.

(Reported by P. K. Asokan, Manojkumar P. P. and Said Koya K. P., Calicut RC of CMFRI.)

Abnormalities in Indian Mackerel



Ovo-testis gonad of Indian mackerel

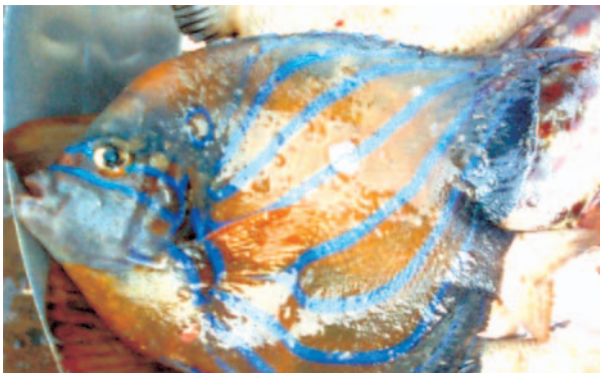
Tri-lobed gonad of Indian mackerel

Gonadial abnormalities in *Rastrelliger kanagurta* (Cuvier, 1817) particularly hermaphroditism has been reported by many authors in the past. In the present observation, out of 37 samples one specimen (220 mm TL and 128 g total weight) landed at Puthiappa Landing Centre by one carrier boat of a ring net on 20-8-2010 had hermaphroditic (ovo-testis) gonad (7 g total wt). In another occasion, one of the specimens of Indian mackerel (273mm TL: and 253 g Total wt.) landed at Puthiyappa by one gill netter on 1-9-2010 had tri-lobed ovary (8.0 g total wt.).

(Calicut Research Centre)

Fishermen's awareness to save a 'Blue-ringed angel fish' at Versova fishing village, Mumbai

Fishermen from Versova fishing village were in for a surprise when they found a live Blue-ringed angel fish, *Pomacanthus annularis* (Bloch, 1787) in their trawl catch. The fish was caught at a depth of about 40-50 m off Versova on 15-11-09. The fish measured about 300 mm in total length and was in a very healthy condition. On seeing the beauty of the fish the fishermen immediately transferred it to a container containing sea water. After unloading the catch the fishermen took the fish to their house and transferred it to a huge glass aquarium. The tank was filled with synthetic sea water which the fishermen had procured from local marine aquarium store. The Scientific staff of CMFRI, visited the place and gave necessary help for the upkeep of the fish. The Fish was fed with marine algae and small pieces of prawns which it readily accepted. The tank was fitted with an aerator and water filter. The fish survived and very well acclimatised to its new environment. It was very moving to see the care given by the fishermen for this fish and after a month the fishermen were of the opinion that the fish should be released back to the sea, which they eventually did. This gesture has contributed to the rehabilitation and conservation of such a beautiful coral fish.



Pomacanthus annularis

(Reported by Sujit Sundaram and S.G.Raje, Mumbai Research Centre of CMFRI.)

Training Programme

Training programme on 'Ornamental fish culture' at Vizhinjam Research Centre

A training programme on Marine ornamental fish culture was successfully organized and conducted at Vizhinjam Research Centre of CMFRI with financial support from NFDB, Hyderabad from 15th to 24th July 2010.

Twentyfive participants from different parts of the country attended the training. The training programme commenced with an impressive inaugural function in which Shri. S. Sharma, Hon'ble Minister for fisheries, Govt. of Kerala delivered the inaugural address and released the manual. The function was presided by Adv. George Mercier, MLA, Kovalam. Officials from Department of Fisheries, Port, Harbour, Coast guard and CPWD attended the function. In addition to trainees, fishermen, fish farmers, and other interested general public participated in the programme.

Release of Training Manual by Shri. S. Sarma, the Hon'ble Minister for Fisheries received by Adv. George Mercier, MLA, Kovalam

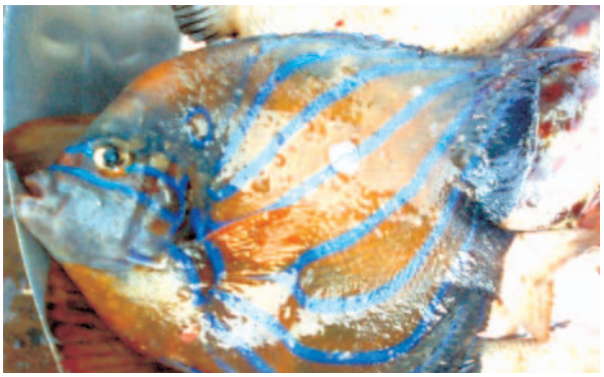
Training programme for students of CIFE, Mumbai at Tuticorin RC

Students with faculty members

A hands on training programme was conducted at Tuticorin RC of CMFRI for the M.F.Sc., (Fisheries Resources Management) students of Central Institute of Fisheries Education, Mumbai from 5th to 13th August 2010. Five boys and three girl students attended. The course programme was coordinated by Dr. I. Jagadis, Senior Scientist under the guidance of Dr. M.S. Madan, SIC, TRC of CMFRI. Theory / practical classes on marine capture fisheries resources, bivalve hatchery and mariculture were taught. Field visits to major landing centres were also conducted by the Scientists of the Centre in their field of specialization.

Fishermen's awareness to save a 'Blue-ringed angel fish' at Versova fishing village, Mumbai

Fishermen from Versova fishing village were in for a surprise when they found a live Blue-ringed angel fish, *Pomacanthus annularis* (Bloch, 1787) in their trawl catch. The fish was caught at a depth of about 40-50 m off Versova on 15-11-09. The fish measured about 300 mm in total length and was in a very healthy condition. On seeing the beauty of the fish the fishermen immediately transferred it to a container containing sea water. After unloading the catch the fishermen took the fish to their house and transferred it to a huge glass aquarium. The tank was filled with synthetic sea water which the fishermen had procured from local marine aquarium store. The Scientific staff of CMFRI, visited the place and gave necessary help for the upkeep of the fish. The Fish was fed with marine algae and small pieces of prawns which it readily accepted. The tank was fitted with an aerator and water filter. The fish survived and very well acclimatised to its new environment. It was very moving to see the care given by the fishermen for this fish and after a month the fishermen were of the opinion that the fish should be released back to the sea, which they eventually did. This gesture has contributed to the rehabilitation and conservation of such a beautiful coral fish.



Pomacanthus annularis

(Reported by Sujit Sundaram and S.G.Raje, Mumbai Research Centre of CMFRI.)

Training Programme

Training programme on 'Ornamental fish culture' at Vizhinjam Research Centre

A training programme on Marine ornamental fish culture was successfully organized and conducted at Vizhinjam Research Centre of CMFRI with financial support from NFDB, Hyderabad from 15th to 24th July 2010.

Twentyfive participants from different parts of the country attended the training. The training programme commenced with an impressive inaugural function in which Shri. S. Sharma, Hon'ble Minister for fisheries, Govt. of Kerala delivered the inaugural address and released the manual. The function was presided by Adv. George Mercier, MLA, Kovalam. Officials from Department of Fisheries, Port, Harbour, Coast guard and CPWD attended the function. In addition to trainees, fishermen, fish farmers, and other interested general public participated in the programme.

Release of Training Manual by Shri. S. Sarma, the Hon'ble Minister for Fisheries received by Adv. George Mercier, MLA, Kovalam

Training programme for students of CIFE, Mumbai at Tuticorin RC

Students with faculty members

A hands on training programme was conducted at Tuticorin RC of CMFRI for the M.F.Sc., (Fisheries Resources Management) students of Central Institute of Fisheries Education, Mumbai from 5th to 13th August 2010. Five boys and three girl students attended. The course programme was coordinated by Dr. I. Jagadis, Senior Scientist under the guidance of Dr. M.S. Madan, SIC, TRC of CMFRI. Theory / practical classes on marine capture fisheries resources, bivalve hatchery and mariculture were taught. Field visits to major landing centres were also conducted by the Scientists of the Centre in their field of specialization.

Training programme on 'Spherical nucleus implantation'

Chief Guest Dr. M.C. Nadheesa, Dean, Fisheries College and Research Institute, Tuticorin addresses the meeting

A ten days second phase training programme on 'Spherical nucleus implantation' for the beneficiaries from Sippikulam village under the project 'Demonstration and transfer of technology of pearl culture' funded by CMLRE, Kochi was inaugurated at the 'Training cum Nucleation Centre' developed at Sippikulam village on 03.09.2010. Dr. M.C. Nadheesa, Dean, Fisheries College and Research Institute, Tuticorin was the Chief Guest, who inaugurated the training programme and distributed the training material. Dr. M.S. Madan, SIC, Tuticorin RC of CMFRI presided over the function. The function was attended by Rev. Fr. Selvan, village headman Shri. Sakayam, trainees and Scientists of Tuticorin RC of CMFRI. Dr. I. Jagadis, Principal Investigator of the project welcomed and briefed the details of the training programme.

Training for skilled workers from Lakshadweep

A training programme on fish landing data collection methodology and fish identification to skilled workers appointed at Minicoy, Agatti, Kavaratti, Androth and Bitra was conducted from 19 to 24 July 2010 at CMFRI, Cochin. The skilled workers were trained in fish identification, fishery data collection, data entry and fishery biology by the Associate Investigators, Shri. K. P. Said Koya, Dr. J. Jayasankar and Smt. U. Ganga supported by the Research Associates and Senior Research Fellows under the project. A methodology manual was prepared and released during the training programme. The certificates were given to the participants by Dr. G. Syda Rao, Director, CMFRI in the presence Dr. E. V. Radhakrishnan, Consortium Principal Investigator (NAIP).

Training Programme on 'Familiarization of cage culture techniques on seabass'

Trainees attending the Rastriya Krishi Vikas Yojana (RKVY) Programme conducted at Mangalore RC of CMFRI

The Mangalore Research Centre of CMFRI conducted a one day training programme on '*Familiarization of cage culture techniques on seabass*' for fishermen leaders and fish farmer entrepreneurs of MATSYSFED, Kasargode, Kerala on 07.08.2010. The training programme formed part of the implementation of *Rastriya Krishi Vikas Yojana* (RKVY) Programme. Dr. Dineshbabu, Scientist-in-Charge, Dr. Sujitha Thomas, Senior Scientist and Dr. Geetha Sasikumar, Scientist interacted with the participants and imparted hands on training to them.

New Heights

Dr Vinay D Deshmukh, SIC of Mumbai RC of CMFRI was appointed as Member of the Committee of experts on assessment of loss of fish stock and compensation to the fishermen by Govt of Maharashtra.

9th Indian Fisheries Forum

CMFRI to host 9th Indian Fisheries Forum at Chennai during 19-23 December 2011.

CMFRI won Rajarshi Tandon Award

CMFRI has won the Rajarshi Tandon Award (2nd prize) for Best Official Language Implementation activities among major institutes of ICAR for the year 2009. Dr. G. Syda Rao, Director, CMFRI received the award from Hon'ble Union Minister of State for Agriculture Prof. K.V. Thomas at a function organized in connection with the ICAR Foundation Day on 16th July, 2010 in the presence of Shri. Sharad Pawar, Hon'ble Union Minister for Agriculture, Government of India.

Dr. G. Syda Rao, Director, CMFRI receiving the award from Hon'ble Union Minister of State for Agriculture Prof. K.V. Thomas.

Hindi Workshops

Veraval

Dr. Thangavelu R. and Mr. Sreenath K. R. have attended TOLIC meeting of Veraval held at LIC office, Veraval on 27.08.2010.

Tuticorin

A one day workshop was conducted at Tuticorin Research Centre of CMFRI on 15-07-2010. During the workshop classes were held on the subjects Hindi Grammar, Noting and Drafting. Total 38 officers and staff attended the workshop.

Hindi day was celebrated on 15.09.2010 at Tuticorin RC of CMFRI

Mumbai

A one day workshop was organized at Mumbai Research Centre of CMFRI on 18-08-2010 on the subject Oil spill of Mumbai. All members of staff attended the workshop.

'Hindi Saptah' was inaugurated on September 15 as a part of hindi language implementation.

Conducted Hindi Trimonthly meeting of the centre on 18.08.2010

Organized Hindi workshop on 18.08.2010, Shri Punam Khandagale, Tech Assistant (T-3) & Shri Vaibhav Mhatre, Field Assiatant (T-1) presented a lecture on Oil Spill off Mumbai in Hindi.

OLIC meeting

82nd quarterly meeting of the the Official Language Implementation Committee of the Institute was held on 23-06-2010 under the Chairmanship of Dr. G. Syda Rao, Director. All Heads of Divisions and Sr. Administrative Officer attended the meeting. Necessary suggestions for the improvement of Official Language Implementation and action plan for the period 2010-11 were chalked out in the meeting.

Hindi Week at Mangalore Research Centre

Hindi day celebrations at Mangalore RC of CMFRI

The Mangalore Research Centre of CMFRI Mangalore celebrated the Hindi week during 14-18 September 2010 and the valedictory function was conducted on 18th September 2010. Shri. K.M. Shetty, Deputy General Manager, BSNL, Mangalore and Smt. K. Jayalakshmi, Assistant Manager (Official Language), BSNL, Mangalore were the chief guests of the day. Various competitions in Hindi were conducted for the staff members of the Research Centre. All staff members actively participated in the events. The Chief Guest Shri. K.M. Shetty, Deputy General Manager, BSNL, Mangalore distributed the prizes to the winners.

Staff of the Mangalore Research Centre of CMFRI, Mangalore also actively participated in the different competitions held by the Town Official Language Implementation Committee in connection with Hindi week celebrations. Shri. G.S,Bhat, Technical Officer won the first prize in Hindi essay Competetion and Dr. Bindu Sulochanan won the Third Prize for 'Varnanukram Lekhan" competition and brought laurels to the Research Centre.

Dr. B. Meenakumari, Deputy Director General (Fisheries) visits Visakhapatnam, Mumbai and Calicut centres

At Visakhapatnam RC on 7.09.2010

At Mumbai RC on 31.08.2010

At Calicut RC on 19.07.2010

Visit of Joint Secretary (Fisheries) and Director General, FSI

Shri. Tarun Sridhar, Joint Secretary (Fisheries), Ministry of Agriculture, Government of India and Dr. M. Vijayakumaran, Director General, FSI, Mumbai visiting the National Repository Museum on 31-8-2010 at H/Qs.

Programme participation

Dr. G. Syda Rao, Director

- Attended the ASRB-NAIP Launching Workshop held at ICAR, New Delhi on 01.07.2010
- Attended the 217th meeting of the Governing Body of ICAR Society held at New Delhi on 02.07.2010
- Attended the Directors meeting held at ICAR, New Delhi on 14.07.2010
- Attended the ICAR Foundation Day meeting and received the Rajarshi Tandon Award for the Hindi implementation 2nd prize held at ICAR on 15.07.2010.
- Presided over the Seabass harvest festival and National Workshop on open sea cage farming held at Karwar Research Centre of CMFRI on 17.07.2010.
- Attended the Open Sea Cage Fish Harvest Mela organized by Madras Research Centre of CMFRI on 03.08.2010.
- Convened a joined meeting with the Scientists of CMFRI and CIBA in connection with the 9th Indian Fisheries Forum on 04.08.2010 at Chennai
- Attended the 218th meeting of the Governing Body of the ICAR Society held on 3 to 9, September, 2010 at New Delhi.

Dr. R. Sathiadhas, Head, SEETTD participated in the National Review Workshop of ATIC on 3rd July, 2010 at New Delhi and presented the progress report.

Dr. C. Ramachandran, Programme Co-ordinator participated in the SAC meeting of KVK at Thrissur on 05-09-2010.

Dr. Vipinkumar. V. P., Senior Scientist participated in the innovation-4-industry meet held at Visakhapatnam on 8th September 2010.

Dr. Shyam.S.Salim, Senior Scientist attended the capacity building workshop on 'WTO and Trade Issues' under the UNCTAD-DFID project "Strategies and preparedness for trade and Globalization in India held at New Delhi during 20-22 July 2010.

Dr. Veerendra Veer Singh Participated as nominated member in Institute Management Committee of NBFGR at Lucknow on 28.08.2010.

Shri. F. Pushparaj Anjelo, SMS, Agricultural Extension, participated in the inaugural function of 'Kalpagam-2010' the Technology week celebration of KVK of CPCRI, Kayamkulam on 01-09-2010.

Innovation-4 Industry Meet at Visakhapatnam

Dr. B. Meenakumari, DDG (Fy) and dignitaries visiting CMFRI pavilion

An event focusing on showcasing innovative and promising technologies in fisheries named as "Innovation 4 Industry Meet" was held in Hotel Daspalla, Visakhapatnam on 8th September, 2010 which was jointly organized by Zonal Technology Management Centre, Business Planning & Development Unit (ZTMCBPDU), South Zone, CIFT and NFDB. The meet brought together innovators and entrepreneurs for fisheries industry on the same platform which showcased the commercially viable technologies developed by the various fisheries research institutes under ICAR. CMFRI brought out five entrepreneur- ready technologies in the meet. Dr.Vipinkumar.V.P, Senior Scientist presented the technologies and coordinated the CMFRI pavilion for the exposition of technologies. Industrialists and entrepreneurs from the various parts of the country were gathered which brought out significant media attention through good coverage in the newspapers and media channels of Andhra Pradesh on indicative economics of the commercial technologies of CMFRI such as 'Green Mussel extract (GMe)', 'Varna (the marine ornamental fish feed)', 'Broodstock development, captive breeding and larval production of 17 species of marine ornamental fishes', 'Larval production of Cobia fish' and 'Cost effective open sea cage farming'. The event aimed to strengthen the partnership between research organizations and the private sector towards a progressive and sustainable fishery industry in India. The entire event was a good opportunity for the entrepreneurs / business sector to shop for the best technologies to venture.

Onam celebrations

Pookkalam at CMFRI Head Quarters

Onam, the traditional festival of Kerala was celebrated at CMFRI, Kochi on 19th August 2010 with colourful events such as *'Pookalam Competition'* Vadam Vali Competition, followed by *Onasadya* (Feast) and '*Kaliyum Chiriyum*' an event with several competitions. Altogether 9 divisions participated in the *Pookalam* Competition and Mariculture team won the first prize and received the cash prize of Rs. 2000/-. Marine Biotechnology Division and Molluscan Fisheries Division won the second and third prize respectively. Dr. G. Syda Rao, Director, CMFRI inaugurated the competitions and distributed the prizes to the winners. Dr. V. Kripa, President, CMFRI Staff Recreational club proposed the vote of thanks.

Mariculture Division receiving the first prize for *Pookkalam* from the Director

Pookkalam at Vizhinjam RC

A view of *Vadamvali* competition

On Farm Testing (OFT) & Front Line Demonstration (FLD) Programmes initiated by *Krishi Vigyan Kendra*, Narakkal

Testing adaptability of Brush Cutter for harvesting paddy

The following programmes of OFT/ FLD were initiated during the period. Under On Farm Testing Programmes,

1) Nursery rearing of Seabass (from Hatchery) as a new source of income,
2) Adaptability of Brush cutter for harvesting Paddy.
3) On-farm production of organic manure in coconut garden.
4) Testing of new Pokkali Paddy Var. VTL-8 and
5) Evaluation of new var. of Napier

under Front Line Demonstration programmes

1) Cage culture of Seabass in open backwater system.
2) Scientific management of stem bleeding in Coconut using Tridemorph & Neam cake
3) Eco-friendly management of Fruit fly in Cucurbits using Pheromone trap,
4) Cultivation of High-yielding Hybrid Coconut, '*Kerasree*'
5) Demonstration of Hand-operated Cassava Chipping machine.
6) Demonstration of new High yielding cassava var. *Shree Vijaya*.

'*Parisheelana Kalari*' an Awareness programme for residents association organized by the KVK and Tapovanam a NGO, was conducted on 27-07-2010 at Renewal Centre, Kaloor, Ernakulam.

'*Naattarivu Parisheelanam*' an Awareness programme for farmers was organized by the KVK and Tapovanam an NGO, at Ochanthuruthu on 04-09-2010.

(KVK Narakkal)

Dr. C. Ramachandran, Programme Co-ordinator (In-charge), KVK inaugurating the 'Pariseelana Kalari'

KVK Training programmes

Participants of the training programme on organic farming at Kanjiramattam

Training courses were organized, on-campus as well off-campus for the benefit of Practicing farmers, Rural youth and Extension personnel as training programmes forms an integral part of the KVK activity. The Krishi Vigyan Kendra has organized a total of 12 training courses for 293 villagers including practicing farmers and rural youth in three disciplines viz. Agriculture, Home Science and Animal Husbandry

CMFRI participated the following Exhibitions

Exhibitions

INFISH 2010 Exhibition at Hyderabad

'Kalpakam 2010' Exhibition at CPCRI, Kayamkulam

APPOINTMENTS

Name	Designation	Center	w.e.f
Smt. P. Hemasankari	Scientist	Madras RC	18.06.2010
Smt. Sangaru Padmaja Rani	T-1 (Field Assistant)	Visakhapatnam RC	12.07.2010
Shri Mamidi Sathishkumar	T-3 (Technical Assistant)	Visakhapatnam RC	06.08.2010
Shri Suresh Kumar Mojjada	T-6 (Technical Officer)	Veraval RC	14.07.2010
Shri M. Anbarasu	T-3 (Technical Assistant)	Veraval RC	28.07.2010
Shri Shiju P.	T-1 (Field Assistant)	Veraval RC	17.07.2010
Shri S. Pradeep	T-1 (Field Assistant)	Veraval RC	22.07.2010
Shri Punam Ashok Khandagale	T-3 (Technical Assistant)	Mumbai RC	15.07.2010
Shri Vaibhav Dinkar Mhatre	T-1 (Field Assistant)	Mumbai RC	27.07.2010
Shri Narasimhulu Sadhu	T-3 (Technical Assistant)	Karwar RD	12.07.2010
Ms. Sonali S. Mhaddolkar	T-3 (Technical Assistant)	Karwar RC	12.07.2010
Shri N. Selvakumar	T-1 (Field Assistant)	Karwar RC	19.07.2010
Ms. Dhanya G.	T-1 (Field Assistant)	Karwar RC	12.07.2010
Ms. Lavanya S.	T-3 (Technical Assistant)	Mangalore RC	12.07.2010
Shri Muhsin A.I.	T-1 (Field Assistant)	Mangalore RC	26.07.2010
Shri Shaik Mohammed Yousuf	T-3 (Technical Assistant)	Madras RC	13.07.2010
Shri P. Rajendran	T-1 (Field Assistant)	Madras RC	13.07.2010
Shri G. Hanumantha Rao	T-3 (Technical Assistant)	Mandapam RC	13.07.2010
Shri R. Selvakumar	T-1 (Field Assistant)	Mandapam RC	13.07.2010
Shri M. Radhakrishnan	T-1 (Field Assistant)	Hqrs., Kochi	14.07.2010
Shri Arun Surendran	T-3 (Technical Assistant)	Hqrs., Kochi	14.07.2010
Shri Ratheesh T.	T-3 (Technical Assistant)	Hqrs., Kochi	21.07.2010

PROMOTIONS

Names	Promoted		Center	w.e.f
	From	To		
Smt. S. Saradha	UDC	Assistant	Tuticorin RC	02.06.2010
Smt. N. Gomathi	PA	PS	Mandapam RC	02.09.2010
Smt. N. Ambika	PA	PS	Hqrs., Kochi	02.09.2010
Smt. K.K. Kousallia	UDC	Assistant	Hqrs., Kochi	03.09.2010
Smt. M. Rameswari	UDC	Assistant	Mandapam RC	02.09.2010
Smt. Ashlesha Ashok Sawant	UDC	Assistant	Mumbai RC	01.09.2010
Smt. G. Ambika	UDC	Assistant	Hqrs., Kochi	01.09.2010
Smt. N.K. Suseela	UDC	Assistant	Hqrs., Kochi	01.09.2010
Shri N.K. Mohanan	UDC	Assistant	Hqrs., Kochi	01.09.2010\

ASSUMPTION OF CHARGE

1. Dr. T. V. Sathianandan, Sr. Scientist assumed the Charges of Head, FRAD I/C on 15-07-2010 (AN)
2. Dr. C. Ramachandran, Sr. Scientist assumed the charges of SIC, KVK of CMFRI, Narakkal on 15-07-2010 (AN)
3. Dr. (Mrs.) Grace Mathew, Principal Scientist assumed the charges of Head, DFD I/C on 16-07-2010 (FN)
4. Dr. K. Asokakumaran Unnithan, Sr. Scientist assumed the charges of Head PFD I/C on 16-07-2010 (FN)

TRANSFERS

Name	Designation	From	To
Dr. E. Vivekanandan	Principal Scientist	Kochi	Madras RC
Dr. Shubhadeep Ghosh	Scientist	Veraval RC	Visakhapatnam RC
Shri S. Balasubramanian	AAO	Mandapam RC	Madras RC
Smt. I. Santhosi	T-2 (JTA)	Mandapam RC	Madras RC
Shri S. Mohanan	Skilled Support Staff	Kochi	Vizhinjam RC
Shri T.V. Shaji	Skilled Support Staff	Vizhinjam RC	Kochi
Inter-Institutional Transfer			
Shri David Babu	T-1 (Field Assistant)	CPCRI, Kasaragod	Hqrs., Kochi w.e.f. 21.06.2010
Dr. (Mrs.) Miriam Paul Sreeram	Scientist	Karwar RC of CMFRI	Plan Implementation and Monitoring Unit, ICAR , New Delhi

RETIREMENTS

Name *Retirement on Superannuation*	Designation	Center	w.e.f
Shri A. Devendra Gandhi	T-5 (TO)	Madras RC	31.07.2010
Shri M. Krishnan	T-I-3 (Binder)	Hqrs., Kochi	31.07.2010
Shri S. Duraipandian	T-2 (Motor Driver)	Mandapam RC	31.08.2010
Shri S.K. Murali	AAO	Veraval RC	31.08.2010
Shri K. Gurusamy	Skilled Support Staff	Mandapam RC	31.08.2010
Voluntary Retirement			
Shri Nirmal Mathews	T-5 (TO)	Tuticorin RC	16.07.2010

Unique feature of CMFRI National Marine Fishery Data

- CMFRI has been adopting a comprehensive centralised sample survey paradigm for estimation of marine fish landings off peninsular India since the 1950's
- The statistical methodology adopted by the Institute has been officially recognised by FAO.
- Upto 1970 CMFRI data was directly reported to FAO as official statistics
- The procedure adopted is unique on the count of uniformity of conceptualisation, planning, implementation and analysing
- The notable feature is the continuous streak of enhancements and tweaking as a result of review of collated figures over the years
- Present methodology is a variant of two-way stratified multi-stage random sampling
- This sampling scheme belongs to a unique clan of a design wherein systematic and proportionate samplings are done to select main units
- Error estimation at the landing centre day level ensured by the design
- Covers nine maritime states of the peninsular region along with the two UTs of Puducherry and Daman & Diu
- All of 1332 landing centres covered by a group of qualified, trained and dedicated field staff
- Around 80 staff stationed at 25 locations across all maritime states
- Of the 25 stations 10 are research stations with full scientific and infrastructure backup
- Overall operation of this uninterrupted exercise is co-ordinated by Fishery Resource Assessment Division .
- FRAD prepares sampling schedules for all the field staff every month following unbiased sampling procedures
- Equal importance is given for the inclusion of both landing and effort data, with clear delineation of various crafts and gears

Methodology in comparison with rest of the world

Sl No	Parameter	CMFRI methodology	Other methodologies
1.	Statistical footing	Unbiased survey sampling base	Reported figures from various agencies collated
2.	Agency	Unbiased research agency. Uniformity and consistency assured.	Mostly collation of voluntary, mandatory and random disclosures. No uniformity across the data providers
3.	Methodological review	A full fledged review mechanism in place with major relooks assured once in two years	No such review possible as figures are based on merging of inputs
4.	Enumeration	Trained, dedicated staff in place throughout the year	No such ground level setup
5.	Type of data	Primary	Utmost secondary or reported
6.	Deviation quantification	Possible as this has strong statistical footing	No such provision as mostly treated as enumeration
7.	Suitability	Any type of setup-restricted, licensed and open access	Only suited for closed, licensed system
8.	Granulation	To species- day – centre level for more than 2000 species	Mostly limited to commercial species of national importance
9.	Scope	Resource assessment	Commercial tallying and economic reporting

- Catch rate can be granulated to the sector- day level
- Last two decades information stored in a ready to use form with a granularity of district- month- species level, for more than 2000 species

Certain important indicators of coverage under CMFRI methodology*

- Overall weighted coverage of landing centre- days- 5.3 % (as against 1% usually recommended for national level surveys).
- Average number of days covered per landing centre- 5-9 days per month
- Landing centres covered in a month- 448- 546 out of 1332.
- Total number of crafts covered in 2008- 1,47,216 (including repeated crafts)
- Percentage of coverage in mechanised centres- 18.88.
- Coverage of centres contributing to 80-85% of total national landings- 7-8 %.

(* Based on 2008 figures)

cadalmin
CMFRI Newsletter

Cadalmin, the CMFRI Newsletter is a quarterly publication of the Central Marine Fisheries Research institute, Cochin. The publication gives an insight into the major events of the quarter, besides highlighting the salient findings in the research front and dissemination of technological know-how to the farming community.

केंद्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान
CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
कडलमीन TM
cadalmin